

UAMS Department of Pharmacology & Toxicology

Alumni Newsletter, 2017



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WELCOME ALUMNI!

Dear Alumni and Friends,

More than a year has passed since last Spring, when we touched base with the Alumni and Friends of the UAMS Department of Pharmacology & Toxicology via the 2016 newsletter. We hope the past year was a productive and happy period for you and your families! This annual newsletter is intended to update you on recent department accomplishments and events, and also serve as an opportunity to share news from other alumni with you.

From the bird's eye view, the UAMS College of Medicine continues to adapt to rapidly changing clinical and research environments, and the environment in Washington DC makes this process even more interesting! A search is underway for a new Chancellor for UAMS after the retirement of former Chancellor Dan Rahn last month. Our clinical colleagues still are adapting to a "service line" clinical care strategy focused on multi-disciplinary patient care, while our research programs are rebounding from record-low funding levels at NIH. Under the directorship of Dr. Mayeux, our NIGMS-funded T32 Training Program is starting its 5th year, and the renewal application received a very positive score. Our graduating trainees are obtaining competitive postdoctoral, government and biotech positions as we strive to enhance our research, teaching and service missions.

Best wishes as you enjoy the first days of Fall, wherever you live, and please stay in touch!

Galen Wenger PhD, Professor Emeritus and Alumni Chair

Nancy Rusch PhD, Professor and Department Chair

TEACHING AWARDS 2016/2017

Sung Rhee, PhD, an Associate Professor in the department, was the 2016 and 2017 receipt of the sophomore Golden Apple Award. Rhee, pictured at right receiving the award, was voted best teacher two years in a row by the sophomore medical students for the cardiovascular module. Some of the comments received were: "I don't believe we, as a class, have met an instructor who cared about us learning the material as much as Dr. Rhee did. I greatly appreciate this and he has earned my utmost respect"; "Dr. Rhee worked very hard to make sure students mastered the material he was in charge of teaching. His material was some of the hardest we encountered in the cardio unit, and I think he did a very good job of teaching it. I also want to brag on his persistence and availability to the students." The Golden Apple awards are given annually to one faculty member in each year of the curriculum.

In addition, Rhee and Dr. Nancy Rusch (pictured bottom right) were Red Sash recipients for 2016. The Red Sash awards are presented to faculty nominated by the senior class as excellent teachers. Both Rhee and Rusch taught in the cardiovascular module.



NEW FACULTY

Nancy Gray, PhD

Nancy Gray, PhD was appointed professor in the UAMS Department of Pharmacology and Toxicology in 2016. Dr. Gray serves as the Director of BioVentures, the technology licensing office and business incubator for UAMS.



She has more than 30 years of experience in biomedical industries, including medicinal chemistry, pharmaceutical research and development, and business operations. She joined UAMS from the Southern Research Institute in Birmingham, AL, where she was vice president for corporate development. There, Gray led opportunities including mergers and acquisitions, strategic alliances, joint ventures, minority investments, technology licenses and divestitures for the life sciences, engineering, and other businesses. She led the turnaround of infectious diseases contract services business, increasing revenue by \$7 million and profit by \$1.2 million in 3 years.

Earlier, Gray worked in executive roles at a number of companies, including Beijing Med-Pharm Corporation, Vaxinnate Corporation and Elan Corporation. At various startups, she authored business plans that raised \$126M in venture capital financing. She was instrumental in developing two marketed second generation antihistamines, Allegra® and Xyzal®, and is the inventor on 32 issued U.S. patents.

Mahmoud Kiaei, PhD

Mahmoud Kiaei, PhD joined the department as assistant professor in 2016. Kiaei earned his PhD degree at the University of Otago in New Zealand. He worked at Weill Cornell Medical College in New York before coming to UAMS in 2011 to join the Department of Neurobiology and Developmental Sciences. In addition to the Department of Pharmacology and Toxicology, Kiaei has appointments in the Department of Neurology and Department of Geriatrics in the UAMS College of Medicine.



Dr. Kiaei's laboratory is equipped with expertise to develop animal models of motor neuron disease. He utilizes his experience related to pre-clinical studies of diseases including ALS to unravel mechanisms of neurodegeneration. His laboratory uses resources to develop drug discovery strategies with the ultimate goal of fulfilling the unmet need of patients for new medications to treat ALS.

His laboratory recently developed a novel technology in the *Compositions and Methods for Modulating Neuronal Degeneration* (patent pending) and has created and licensed a novel human profilin1 (hPFN1) mutant mouse model that will enable the examination of molecular mechanisms of ALS from a new perspective of cytoskeletal dysfunction.

DR. WESSINGER RETIRES AFTER 34 YEARS



Dr. W. David Wessinger retired from the department on June 30, 2017 after 34 years of service. Wessinger received his PhD from Virginia Commonwealth University in 1983 and began a post-doctoral fellowship at UAMS the same year. He continued his career at UAMS, ultimately achieving the rank of Professor.

Wessinger was appointed as the inaugural Director of the Interdisciplinary Biomedical Sciences (IBS) Graduate Program in 2005 and Director of the MD/PhD Program in 2008. He was awarded the Chancellor's Faculty Teaching Award in 2008 and named Graduate Faculty of the Year by the Graduate School in 2016.

Wessinger served as major advisor to three PhD students and two postdoctoral fellows, and he was a mentor to many junior faculty members. Additionally, he served as a module course director for the medical school, as a mentor for the Abernathy Academic House, and served on the Academic House Leadership Council. He lectured extensively in the graduate and medical schools, and was an active member of the UAMS Teaching with Technology Committee.

A celebration was held in his honor on June 23, 2017. It was attended by many of the faculty, staff and students who worked with Wessinger or were mentored by him.

Save the Date!

*Retirement Reception for
Dr. Joseph Stimers*

September 28, 2017

Helen Guinn Adams Atrium, Biomed I



FACULTY AWARDS AND PUBLICATIONS

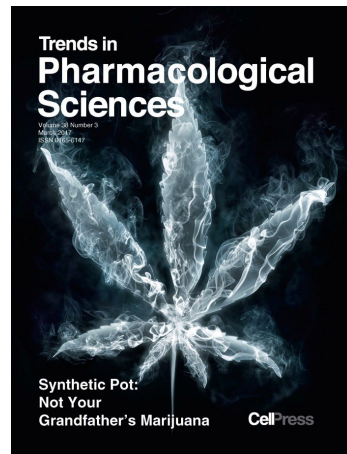
Synthetic Cannabinoid Research Receives Funding and Recognition

Dr. Paul Prather, Professor of Pharmacology and Toxicology, and a team of researchers from UAMS, received national attention for their research and publications on synthetic cannabinoids. One of their articles titled, "Synthetic Pot: Not Your Grandfather's Marijuana," was featured on the March 2017 cover of *Trends in Pharmacological Sciences*. Prather was the lead author and Dr. William Fantegrossi, Associate Professor of Pharmacology and Toxicology, in addition to graduate student Benjamin Ford, and postdoctoral fellow Dr. Sherrica Tai, co-authored the publication.

Prather is leading the first major NIH-funded study of synthetic cannabinoids in the U.S. Last year his interdisciplinary team of researchers received a \$2.7 million grant from the National Institutes of Health (NIH) National Institute on Drug Abuse (NIDA) to determine the man-made cannabinoids' toxicity and inform policymakers as they consider regulating the products. Co-Investigators include Fantegrossi, Dr. Jeffery Moran, Dr. Laura James, and Dr. Anna Radomska-Pandya.

Synthetic cannabinoids are psychoactive chemicals often sprayed on plants that have been cut up to look like natural marijuana. They also are sold as powders, tablets and capsules. While the synthetic compounds target the same cannabinoid receptors as marijuana, the similarity ends there. The synthetic substances are structurally different from marijuana and are linked to dangerous health effects, including psychosis, seizures, dependence and death. Whereas marijuana is easily identified in drug tests, the man-made compounds are not because of their numerous structural differences. Documented cases of synthetic cannabinoids' adverse effects are cited in the journal article by Prather and colleagues, which notes that more than 20 deaths were reported between 2011 and 2014.

Over the next five years, the UAMS team will explore why the synthetic compounds are more toxic than marijuana, even though both activate the same cannabinoid receptors in the brain. Researchers will study the effects of the man-made compounds on human cells in the laboratory, characterize their behavioral and cardiovascular effects in mice, and compare these effects to patients who self-administer synthetic cannabinoids and are admitted to emergency rooms. Despite the dangers associated with man-made cannabinoids, Prather said he hopes scientists will continue to search for synthetic cannabinoids that have therapeutic potential.



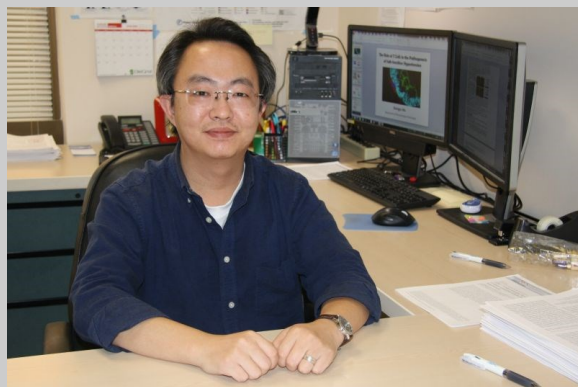
Pictured left to right: Dr. Paul Prather, Dr. Anna Radomska-Pandya, Dr. Jeffery Moran, Dr. William Fantegrossi, and Dr. Laura James.

FACULTY AWARDS AND PUBLICATIONS

Clues to Immunity as a Cause of High Blood Pressure

Shengyu Mu, PhD, Assistant Professor of Pharmacology and Toxicology, and his colleagues used innovative techniques, including super-resolution microscopy in UAMS' Digital Microscopy Core to illustrate activation of immune cells in the kidneys in a rat model of salt-sensitive hypertension, which is a form of high blood pressure that responds directly to salt intake. Their findings in an article titled, "CD8⁺ T Cells Stimulate Na-Cl Co-transporter NCC in Distal Convolute Tubules Leading to Salt-sensitive Hypertension" were published in the January 2017 issue of *Nature Communications*.

Specifically, Mu's work uncovered the interaction of a particular type of white blood cell with kidney cells. Scientists suspected that these cells – T lymphocytes, or T cells – played a role in developing high blood pressure, but the mechanism was unknown. Mu demonstrated that an invasion of T cells into the kidneys may be a major contributor to the salt sensitivity of high blood pressure. A major subtype of the T cells interacts directly with – and actually touches – the distal tubular cells located in the area of the kidneys that reabsorb salt. This process enhances sodium and chloride absorption in the kidney, thereby impairing the intended function of the kidneys to filter out excessive salt. The result is salt-sensitive elevation of blood pressure.



Before coming to UAMS in 2013, Mu received his medical degree from TianJin Medical University in China and was awarded the PhD degree from the University of Tokyo in Japan. Salt-sensitivity and high blood pressure have been Mu's area of research for his entire career. Previously, his work has been published in *Nature Medicine* and the *Journal of Clinical Investigation*. He recently received the New Investigator Award from the American Heart Association, for his abstract and talk titled "Role of Immune Cells in the Kidney in Development of Salt-Sensitive Hypertension."



Dr. Mu also received the Kidney Council New Investigator Award from the American Heart Association Council on Hypertension in 2016, and in January 2017, he was selected as a winner of the 2017 Research Recognition Award by the Renal Section of the American Physiological Society.

The earlier recipient of a Beginning Grant-In-Aid from the American Heart Association, and the recipient of UAMS foundation funds, Mu is preparing to publish additional findings from his research and is writing a NIH New Investigator R01 grant. He would like to identify the molecular basis for T cells interaction with renal tubular cells in the kidney.

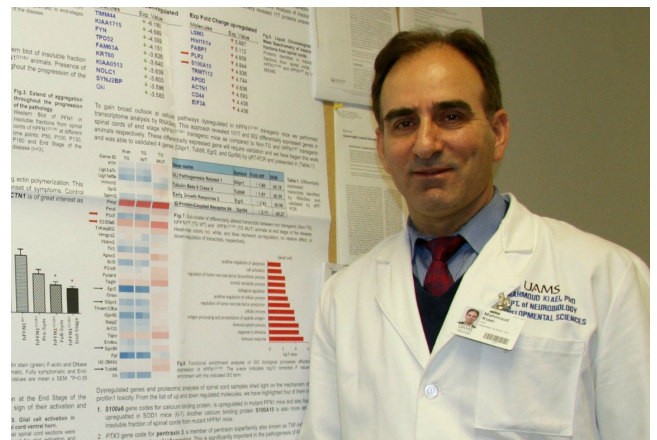
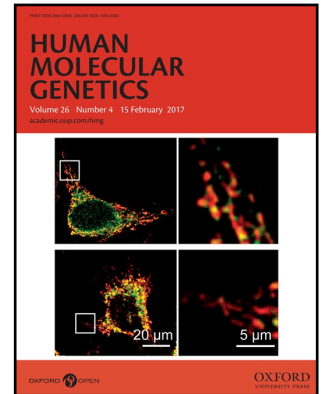
Co-authors on the *Nature Communications* publication included: Dr. Sung Rhee, Dr. Yunmeng Liu, and technicians Tonya Rafferty, Jessica Webber, Li Song and Beixiang He; all were members of the Department of Pharmacology and Toxicology.

FACULTY AWARDS AND PUBLICATIONS

Mouse Model Shows Promise for ALS Research

Dr. Mahmoud Kiaei, Assistant Professor in the Department of Pharmacology and Toxicology, published a paper in the December 2016 issue of *Human Molecular Genetics*. The publication, “Mutant Profilin1 Transgenic Mice Recapitulate Cardinal Features of Motor Neuron Disease,” highlights a new model to replicate Lou Gehrig’s disease in mice, in what Kiaei hopes will bring scientists one step closer to an effective medication.

About 10 percent of ALS cases in the United States are inherited. In the mid-1990s, after the identification of one gene associated with ALS, scientists replicated human ALS in the first mouse model. In 2012, a mutation in another gene, *Profilin 1*, was linked to ALS. With the publication of that discovery, researchers across the world worked to create a mouse model with the mutation. More than a year later, researchers at UAMS and another research team at the University of Massachusetts were both successful in obtaining the mouse model. Kiaei said the fact that both laboratories reached similar results related to the phenotype of the mouse models provides confidence that it will be a powerful model for use in ALS research. Because the new mouse model closely replicates ALS symptoms, researchers hope to get a better understanding of the molecular mechanisms that underlie each stage of the disease.



Kiaei and his team were able to create the mouse model by injecting the human faulty genetic material into fertilized mouse eggs. Successive generations of the mice passed the gene on to half of their offspring, as expected. His next step will be to study the new mouse model “inch-by-inch” to fully document the disease’s progression at the molecular level. He hopes to discover mechanisms by which the genetic mutation causes ALS symptoms. And he expects that UAMS and investigators at other institutions will be able to use the mouse model for testing new therapeutic compounds.



Dr. Mahmoud Kiaei (right) shown with postdoctoral fellow, Dr. Daniel Fil, first author of the *Human Molecular Genetics* publication.

Following the generation of this mouse model of ALS, Kiaei recently received an R03 award, “Alpha-Tubulin Mutation and Motor Neuron Disease” to develop another mouse model incorporating a defective alpha-tubulin gene, which is associated with human ALS.

FACULTY AWARDS

Fantegrossi and Hiranita awarded DEA/FDA Contract

Dr. William Fantegrossi (pictured right above) and Dr. Takato Hiranita (Adjunct Associate Professor, NCTR, pictured right below) were awarded a DEA/FDA Intra-Agency Contract in 2016. The contract was awarded to the National Center for Toxicological Research (NCTR) with a subaward to the Department of Pharmacology and Toxicology.

The Drug Enforcement Administration's (DEA) Office of Diversion Control (OD), Drug and Chemical Evaluation Section, is responsible for evaluating drugs and chemicals to determine whether these substances have abuse potential. These evaluations are used by the DEA to support its domestic scheduling activities. In order for the DEA to determine the abuse potential of drugs and chemicals, pharmacological, medical, epidemiological, and other scientific data for these drugs, when necessary, are needed to initiate the administrative procedure to place these substances under regulatory control according to the guidelines of the Controlled Substances Act (CSA).

As part of this evaluation, data from *in vivo* pharmacological studies are considered highly important in making a determination for initiating a scheduling action. Under this contract, Drs. Fantegrossi and Hiranita will screen novel psychoactive substances currently of regulatory interest using rodent models of abuse-related effects.



Mayeux and Zheng receive Pilot Awards



Dr. Philip Mayeux, Professor and Vice Chair of the Department of Pharmacology and Toxicology, received a College of Medicine Research Scholar Grant in Child Health. His proposal was titled, "Targeting Phosphodiesterase 3 and 4 in a Rat Pup Model of Infant Sepsis-induced Cardiorenal Syndrome". Sepsis is the 8th leading cause of infant mortality in the U.S. and is more prevalent worldwide. Sepsis-induced cardiorenal syndrome, defined as development of acute cardiac dysfunction and acute kidney injury, is a frequent complication of infant sepsis that dramatically increases mortality. There are no effective therapies for infant sepsis and clinicians must rely

on supportive care typically begun only after the onset of symptoms. Mayeux's laboratory will use a clinically relevant rat pup model of infant sepsis to evaluate a new treatment paradigm that targets phosphodiesterase 4.



Dr. Fang Zheng, Associate Professor of Pharmacology and Toxicology, is the recipient of a UAMS Fund-to-Cure-Stroke Foundation Award. His project titled, "Role of TRPC3 Channels in Neurovascular Coupling and Peri-infarct Depression", will use selective TRPC3 channel inhibitors to define the contribution of TRPC3 ion channels to peri-infarct depression and neurodegeneration in a mouse model of stroke. Zheng will investigate the role of TRPC3 channels in endothelial cells and vascular muscle cells, using cell-specific knockout mice to identify the site of the culprit TRPC3 channels.

AMERICAN HEART ASSOCIATION AWARDS

Rhee receives Grant in Aid



Dr. Sung Rhee, Associate Professor of Pharmacology and Toxicology, received a grant-in-aid from the American Heart Association titled “Beta-Adrenergic Receptor Mediated Vasodilation of Cerebral Collateral Arteries”. The grant was awarded for two years beginning July 2017.

Rhee is studying collateral blood vessels in the brain, which provide an important alternative path for blood flow when cerebral arteries become blocked. High collateral blood flow in the brain is clinically important in reducing damage after stroke. A class of drugs called beta blockers (BBs) is widely used to treat hypertension, heart failure, and other conditions. However, recent large-scale studies found that BBs increase adverse stroke outcome, but the reason for their adverse effect is unclear. Rhee proposes that BBs cause narrowing of collateral blood vessels in the brain, which may explain the adverse stroke outcome associated with their administration.

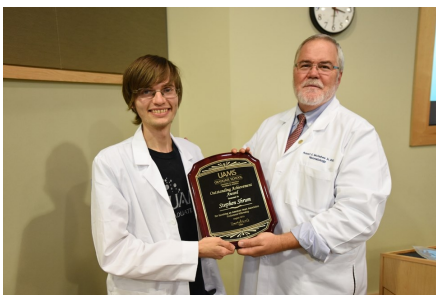
Parajuli awarded Science Development Grant

Dr. Nirmala Parajuli, Instructor in the Department of Pharmacology and Toxicology, was awarded a 3-year Scientist Development Grant from the AHA in July 2016. The grant titled “Ubiquitin Proteasome System, Mitochondria, and Renal Cold Storage” focuses on defining novel molecular mechanisms of cold storage-induced renal damage, and identifying potential therapeutic targets to prevent renal injury during cold storage.

Specifically, Parajuli plans to study the role of the proteasome in mediating mitochondrial damage and renal dysfunction after cold storage plus transplantation using a rat model. She has established a rat kidney cold storage plus transplantation model, which will be fundamental to evaluating the benefit of therapeutic interventions to improve renal function after transplantation.



Shrum receives Predoctoral Fellowship



Graduate student Stephen Shrum (mentors: Drs. MacMillan-Crow and Rusch) was awarded a 2-year Predoctoral Fellowship Grant from the American Heart Association, which began in July 2016. The award provides stipend support for Shrum to conduct research to earn the PhD degree. His project, “The Role of Mitochondrial BK Channels in Renal Cold Preservation”, will use *in vitro* and *in vivo* models to investigate whether loss of the mitochondrial BK channel is implicated in renal cold storage injury.

Shrum also will assess BK channel openers as therapeutics to reduce cold storage injury in renal transplantation. Shrum’s project will use a combination of molecular biology, electrophysiology, and pharmacological techniques applied to renal tubular cells *in vitro* and rat models of renal cold storage and transplantation *in vivo*.

FELLOW AWARDS

Fellow to Faculty Awards

Lisa Brents, PhD and Nirmala Parajuli, PhD were the recipients of 2-year Fellow to Faculty Awards (FFAs) provided by the College of Medicine. The FFAs are intended to help talented postdoctoral fellows transition to faculty positions at UAMS. Both Brents and Parajuli now hold the rank of Instructor in the Department of Pharmacology and Toxicology.



Dr. Brents (pictured left) earned her PhD degree from the department in 2013. She was a postdoctoral fellow in the UAMS Psychiatric Research Institute's Brain Imaging Center until 2016. After receipt of an FFA, she returned to the Department of Pharmacology and Toxicology. Her research focuses on defining potential active metabolites of buprenorphine that cause neonatal abstinence syndrome (NAS). NAS occurs in newborns with chronic prenatal exposure to substance abuse that induces physical dependence (i.e., opioids including heroin, oxycodone, and fentanyl). In June 2017, Brents was awarded a UAMS Research Scholar Pilot Study Award for her proposal titled "The Role of Norbuprenorphine in the Development of Neonatal Abstinence Syndrome."

search Scholar Pilot Study Award for her proposal titled "The Role of Norbuprenorphine in the Development of Neonatal Abstinence Syndrome."

Dr. Parajuli (pictured right) was a postdoctoral fellow in the laboratory of Dr. Lee Ann MacMillan-Crow. She received her PhD degree in 2009 from Innsbruck Medical University in Austria. Her research interest is unveiling the molecular mechanisms responsible for cold storage (CS)-induced renal damage with a focus on therapeutics to improve mitochondrial function before and after renal transplantation. Parajuli received a Barton Pilot Award in June 2017 for her proposal titled "Novel Role of Immunoproteasome During Renal Cold Storage and Transplantation." She also was awarded a highly competitive Scientist Development Grant from the American Heart Association in July 2016 (see page 9).



Dr. Stolarz awarded a PhRMA Predoctoral Fellowship



Dr. Amanda Stolarz (mentor: Dr. Rusch) received a predoctoral fellowship in pharmacology and toxicology in 2016 from the PhRMA Foundation. Subsequently, she was awarded the PhD degree. Currently, Stolarz is a postdoctoral fellow in the Department of Pharmacology and Toxicology, and in the Department of Pharmaceutical Sciences in the College of Pharmacy.

Her project, "Mechanism of Doxorubicin Inhibition of Lymphatic Function and Potential Therapeutics", hypothesized that the chemotherapeutic agent, doxorubicin, induces excessive Ca^{2+} release from ryanodine receptors in lymphatic muscle cells, resulting in lymph vessel constriction, slowed lymph flow, and lymphedema. She proposed that dantrolene can prevent lymphedema. The PhRMA awards support the career development of scientists embarking on research careers that integrate molecular or cellular studies with information on drug action in experimental animals or clinical studies.

HEALTH SCIENCES ENTREPRENEURSHIP BOOT CAMP



The Health Sciences Entrepreneurship Boot Camp students and some of its presenters: Front row (l-r): Catheryn Wilson, Erin Bush, Amanda Stolarz, Samantha McClenahan, Xingui Liu, Dolapo Adejumobi, Carol Reeves, PhD, Walter Harrington, Nancy Gray, PhD, and Michael Owens, PhD. Back row: Brittney Garner, Clark Sims, Chuck Hay, Ithay Biton, Stephen Shrum, Jeff Moran, PhD, Kai Carey, Lauren Russell, and Nancy Rusch, PhD.

In August 2016, the first Health Sciences Entrepreneurship Boot Camp was held on the UAMS campus. The Boot Camp was funded by a supplement from the National Institute of General Medical Sciences to the T32 Training Grant in Systems Pharmacology and Toxicology (SPaT) directed by Dr. Philip Mayeux. It was co-sponsored by UAMS BioVentures and the UAMS Translational Research Institute. Thirteen graduate students and one postdoctoral fellow attended the week-long workshop.

The Boot Camp featured talks by UAMS' entrepreneurial faculty, as well as members of Arkansas' entrepreneurial community. Community presenters included Jeff Stinson, MBA, director of entrepreneurship at Arkansas Regional Innovation Hub in Little Rock, Rebecca Norman, MS, an innovation consultant at Arkansas Small Business and Technology Development Center at UALR and Lee Watson, president of The Venture Center in Little Rock.

Carol Reeves, PhD, Associate Vice-Provost for Entrepreneurship at the UA-Fayetteville, whose MBA students have led the world in business plan competitions, and serial entrepreneur Paul Mlakar, MBA provided key lectures and intensive training sessions. Teams of participants were tasked with developing business plans, which were presented on the final day of the workshop.

SYSTEMS PHARMACOLOGY & TOXICOLOGY (SPaT) T32



The NIGMS-funded Systems Pharmacology and Toxicology (SPaT) T32 Training Grant hosted two annual symposiums since the last newsletter. The annual events were attended by SPaT training faculty, departmental faculty, and students from the Pharmacology, Interdisciplinary Toxicology, and Interdisciplinary Biomedical Sciences graduate programs.

The invited speaker for the 2016 symposium was Dr. Vishal Vaidya from Harvard Medical School. Vaidya presented a seminar titled “Systems and Translational Approach to Understanding Technology”. Dr. Vaidya is an Associate Professor of Medicine and Environmental Health at Harvard Medical School, Harvard T.H. Chan School of Public Health, and Brigham and Women’s Hospital where he directs the Laboratory of Kidney Toxicology and Regeneration. Vaidya is pictured top left with the 2015-2016 SPaT trainees: Julia Tobacyk, Lascelles Lyn-Cook Jr., Charles Hay, Stephen Shrum, Daniel Meeker, and Bill Hyatt; SPaT director, Dr. Philip Mayeux, is pictured middle back.

James H. Woods, PhD, Professor from University of Texas Health Sciences Center at San Antonio was the invited guest for the 2017 SPaT Symposium. Woods presented the keynote address, “Behavioral Discoveries Related to Cholinergic Pharmacology”. He is Professor Emeritus in the Department of Pharmacology at the University of Michigan Medical School, where he began his career as researcher in 1965. Dr. Woods has published more than 450 manuscripts and is recognized internationally for his contributions to behavioral pharmacology. He is pictured top right with the 2016-2017 SPaT trainees: Dolapo Adejumobi, Julia Tobacyk, Bill Hyatt, Ryan MacLeod, Lascelles Lyn-Cook, Jr, Samantha McClenahan, Charles Hay, and Brittney Garner.

Dr. Philip Mayeux serves as director of the NIH/NIGMS-funded T32 Training Grant, which includes more than 30 training faculty from the Colleges of Medicine, Pharmacy, Public Health, Arkansas Children’s Hospital, and the FDA-funded National Center for Toxicological Research (NCTR). The five-year grant supports four PhD graduate students each year. Additional support is provided on a year-to-year basis by the College of Medicine and Translational Research Institute to support a fifth student.

The training program consists of didactic training in pharmacology, toxicology, physiology, pharmacokinetics, metabolism, biostatistics, grant writing, and the responsible conduct of research (RCR). The trainees’ dissertation projects must use an animal model of human disease or involve clinical studies. SPaT is beginning its final year of its first funding period, and a renewal application was submitted and positively reviewed during an April site visit by NIGMS.

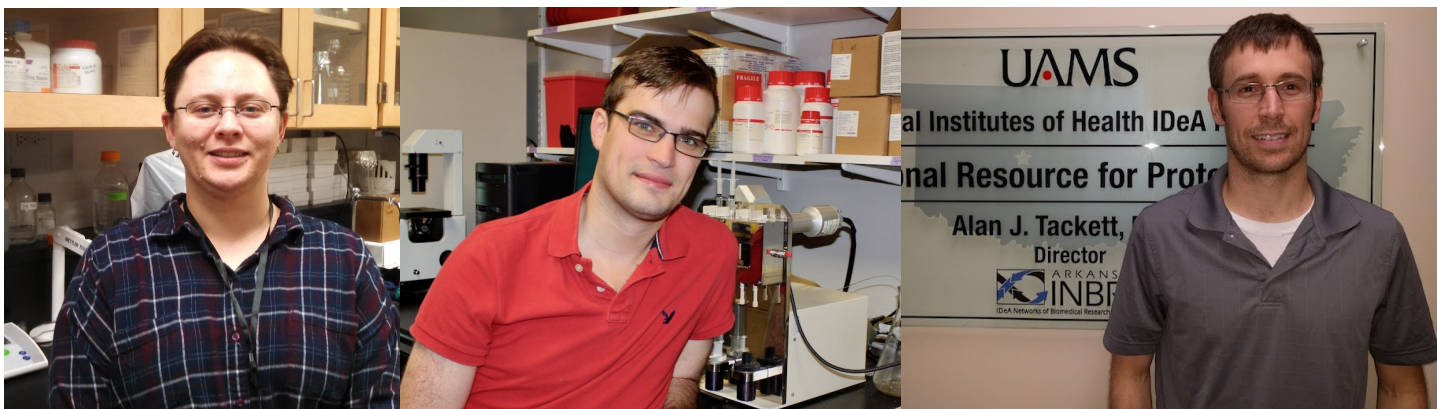
SYSTEMS PHARMACOLOGY & TOXICOLOGY (SPaT) T32



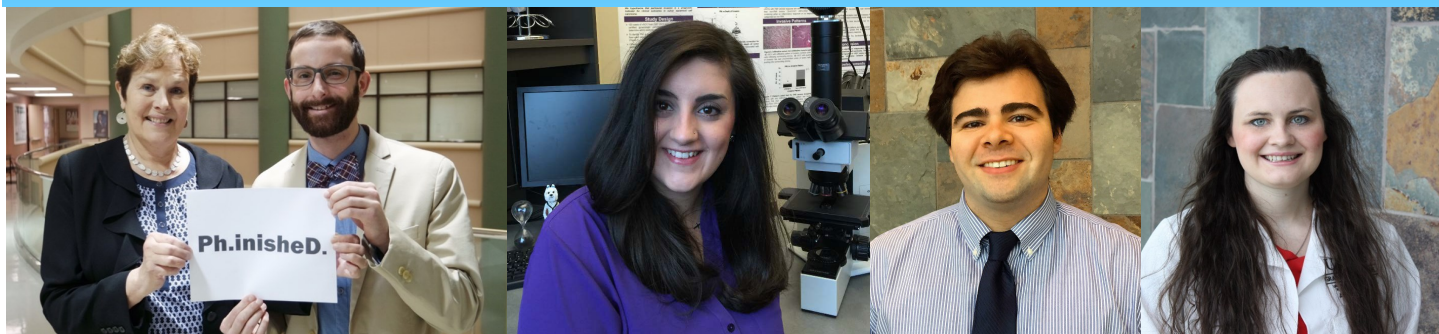
Four students were selected as trainees for the SPaT T32 Training Grant for the 2016-2017 academic year. Dolapo Adejumobi (top left) and Samantha McClenahan (second) were awarded support for two years beginning August 2016. Adejumobi is enrolled in the Interdisciplinary Biomedical Sciences program. Her mentor is Dr. Richard Kurten, Professor of Physiology and Biophysics. She received her BS degree from the University of Arkansas at Little Rock. McClenahan is an interdisciplinary toxicology student mentored by Dr. Michael Owens, who received her undergraduate degree from Vassar College prior to beginning graduate school at UAMS.

Receiving support for one year were Ryan MacLeod (third) and Brittney Garner (top right). MacLeod is an MD/PhD student in the Interdisciplinary Biomedical Sciences graduate program. His mentor is Dr. Charles O'Brien in the Department of Internal Medicine. MacLeod's undergraduate degree is from University of Arkansas at Fayetteville. He was supported by matching funds from the UAMS Translational Research Institute (TRI) and College of Medicine for 2016-2017. Garner is enrolled in the pharmacology graduate program. Dr. Nancy Rusch serves as her mentor. Garner received her BS from East Texas Baptist University. She replaced 2015 SPaT trainee, Stephen Shrum, who received an American Heart Association Predoctoral Award in 2016 after only one year in the SPaT program.

Three students were chosen for SPaT support in 2017. They are 2nd year students in the new common admissions GPIBS graduate program. Laura Ewing (bottom left) and Lucas DeYoung (bottom middle) will receive two years of support, and Brian Koss (bottom right) will receive one year as the TRI/COM recipient. Ewing earned a MS degree from the University of Oklahoma. She is co-mentored by Dr. Igor Koturbash in the College of Public Health and Dr. Annie Lumen at NCTR. DeYoung is mentored by Dr. Kevin Raney in the Department of Biochemistry. He received his BS from John Brown University. Koss' mentor is Dr. Alan Tackett in the Department of Biochemistry. He received his BA from Hendrix College in 2008.



2015-2016 GRADUATIONS AND THESIS TOPICS



Four students graduated from the department in 2016. Benjamin Lieblong (pictured top left with advisor Dr. Nancy Rusch) defended his dissertation in April 2016, titled “Detection and characterization of early-phase experimental radiation-induced heart disease”. Dr. Lieblong is a clinical research coordinator in the Department of Pathology at UAMS.

Emily Holthoff (second) defended her dissertation in May 2016, titled “Identifying pathologic and molecular features that predict adverse clinical outcomes in vulvar squamous cell carcinoma”. Her advisor was Dr. Steven Post in the Department of Pathology. Dr. Holthoff returned to medical school at UAMS to finish her MD degree.

Alex Alund (third) defended his dissertation in June 2016. It was titled “The role of reactive oxygen species in alcohol-induced osteopenia and the regulation of bone turnover”. Former UAMS faculty member, Dr. Martin Ronis, served as his advisor. Dr. Alund is an analyst and consultant for PinPoint Testing, LLC in Little Rock.

Amanda Stolarz, PharmD (top right) defended her dissertation in July 2016, which was titled “Doxorubicin inhibition of lymphatic function and prevention by dantrolene”. She is a postdoctoral fellow at UAMS and continues her research with Dr. Nancy Rusch in the Department of Pharmacology and Toxicology with a teaching appointment in the College of Pharmacy.

2016-2017 GRADUATIONS AND THESIS TOPICS



The department graduated three students this academic year. Clark Sims (pictured top left) defended his dissertation in November titled “Preclinical studies of targeted therapy in an infant model of sepsis-induced cardiorenal syndrome”. Dr. Philip Mayeux served as his mentor. Dr. Sims is a postdoctoral fellow at Arkansas Children’s Nutrition Center.

Two students mentored by Dr. Paul Prather successfully defended. Lirit Franks (right) defended her dissertation in December titled “Pre-clinical drug development of two novel structural classes of cannabinoid ligands: Indole quinclidines and selective estrogen receptor modulators”. She is planning to pursue a postdoctoral position.



Max Ford (bottom left) defended his dissertation in July 2017, which was titled “Characterization of novel molecular scaffolds for cannabinoid receptor ligands: Implications for drug development”. Dr. Ford is a postdoctoral fellow mentored by Dr. Merle Paule at NCTR.

2016 RESEARCH INDUCTION



Congratulations to the following graduate students for their induction into the PhD program in September 2016.

Christopher Bolden (top left) is performing his dissertation research in Dr. Eric Peterson's laboratory.

William Hyatt (top middle) is enrolled in the MD/PhD program and is mentored by Dr. William Fantegrossi.

Lascelles Lyn-Cook (top right) is mentored by Dr. Philip Mayeux.

Stephen Shrum (middle left) is co-mentored by Drs. Lee Ann MacMillan-Crow and Nancy Rusch.

Also mentored by Dr. MacMillan-Crow is Julia Tobacyk (bottom left) Julia is enrolled in the pharmacology graduate program.

NEW PHARMACOLOGY TRACK STUDENTS



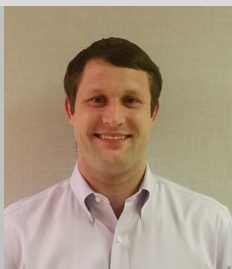
Christian Cabanlong, BS (Mentor: Dr. Paul Prather)
Undergraduate Degree: University of New Mexico

Research Interests: Signal transduction



Laura Ewing, MS (Mentors: Drs. Igor Koturbash & Annie Lumen)
Undergraduate Degree: University of Oklahoma

Research Interests: Interactions of diet and radiotherapy in improving cancer treatment outcomes



Kyle Urquhart, BS (Mentor: Dr. William Fantegrossi)
Undergraduate Degree: University of Georgia

Research Interests: Behavioral pharmacology of synthetic opioids

REJUVENICS TECHNOLOGIES WINS GOVERNOR'S CUP

Congratulations to Dr. Amanda Stolarz, postdoctoral fellow in the Department of Pharmacology & Toxicology and Department of Pharmaceutical Sciences for being a member of the team that won the Donald W. Reynolds Governor's Cup business-plan competition in 2017. Their business plan focused on using a unique delivery system to deliver chemotherapeutic agents directly to tumors. Their team, Rejuvenics Technologies won first place and \$25,000 for their business plan to develop the patented technology of which UAMS Professor, Dr. Michael Borrelli, was one of the inventors.

Stolarz is the CSO for Rejuvenics Technologies, a startup at the University of Arkansas, Fayetteville. Rejuvenics Technologies is working with St. Jude Children's Research Hospital in Memphis, and Stolarz is hopeful they can develop a product that will lead to improved quality of life for cancer patients. Stolarz credits the Health Sciences Entrepreneurship Boot Camp she attended in 2016 (page 11) with helping her understand how to move discoveries from the lab to the bedside table. "Without the Boot Camp, it would have been a much harder sell for me to join the Rejuvenics Technologies team."



Rejuvenics Technologies team members Joshua Phillips, Tiffany Jarrett, and Dr. Amanda Stolarz with Rush Deacon, CEO, Arkansas Capital Corporation, Gov. Asa Hutchinson, team advisor Dr. Carol Reeves, and Kevin Burns, chairman of the board, Arkansas Capital Corporation.

COLLABORATION WITH SAITAMA UNIVERSITY

Dr. Alexei Basnakian has established a collaborative relationship with Dr. Alexandre Loukanov, a Professor from Saitama University in Tokyo, Japan. Basnakian met Loukanov at the 2nd Global Nanotechnology Conference in Las Vegas in 2016. They realized immediately that Loukanov's interest in nanomaterial chemistry of new anticancer drugs, and Basnakian's interest in testing of nanomaterial-based drugs for their anticancer specificity and potential toxicity in cells and animals, represented a strong collaboration.

Basnakian was a guest of Loukanov in 2017. During his visit to Saitama University, he gave a presentation to students and faculty titled "Cellular DNase network in tissue injury and nanotoxicity assessment".

Loukanov, in turn, visited UAMS in June 2017 to present a seminar titled, "From nonparticles to nanomachines and nanorobots: Sustainability and perspectives for nanomedicine". The research discussions from these visits resulted in an exciting project and grant proposal, which will be submitted in both countries, and if funded, will focus on the development of innovative nano-based anticancer therapy.



GRADUATE RECOGNITION

Seager-Braswell Student Research Symposium

The Department held its annual Seager-Braswell Student Research Symposium in February 2017, which featured research presentations by 3rd and 4th -year graduate students to an audience of faculty, trainees, and research staff. Dr. Philip Mayeux directed the event, and faculty members scored the students' talks.



Seager-Braswell awardees (left to right): Daniel Meeker, Max Ford and Julia Tobacyk with symposium director, Dr. Philip Mayeux.

The first place award in the Senior Competition was given to SPaT trainee, Daniel Meeker (mentor: Dr. Mark Smeltzer) for his talk "Generation of photothermal effects from gold nanocages for the targeted treatment of *Staphylococcus Aureus* biofilms". Max Ford (mentor: Dr. Paul Prather) took the runner-up position for his presentation "*In vitro* and *in vivo* characterization of a novel highly G-protein biased CB₁ agonist: Implications for drug development".

Julia Tobacyk (mentor: Dr. Lee Ann MacMillan-Crow) won first place in the Junior Competition for her talk titled, "Methionine deficiency enhances the efficacy of radiotherapy in a metastatic melanoma model".

ASPET Graduate Awards at EB2016



Amanda Stolarz (top left) won first place for her oral presentation in the Young Investigator Platform Award sponsored by the ASPET Division for Translational and Clinical Pharmacology. Amanda is a member of the Rusch laboratory. Clark Sims (top right) took third place in the Poster Session category of the same division. Clark was a member of the Mayeux laboratory.

FUTURE ALUMNI



Raney Jane Sims

January 4, 2017

*First child of Clark Sims
(recent graduate)*

Noah Paul Bobryshev

January 29, 2017

*First grandson
of Dave Wessinger*



ALUMNI and OTHER FRIENDS (NEW UPDATES)

Kelly Byrnes-Blake (PhD, Owens) has a pharmacokinetic business, Northwest PK Solutions, that is growing and doing well. She stays busy with her children (ages 11 and 13) and her husband's fishing business.

Neil Detweiler (PhD, Rusch) continues his work as a postdoctoral fellow at the University of New Mexico studying pulmonary vascular physiology. He and his wife **Rachel Versluis** (Research Technician, Rusch) and their sons Owen (3) and Emrys (1) are doing well.

Ben Lieblong (PhD, Rusch) is a Clinical Trial Coordinator in the Department of Pathology at UAMS working on a Phase 2 trial of a therapeutic HPV vaccine.

Jessica Macchi (Administration) is a Research Administrator in the Office of Sponsored Programs Administrative Network at UAMS.

Celia McCaslin (Administration) is a Program Coordinator for the Anatomical Gift Program at UAMS.

Donald McMillan (Past Chair) has moved from Isle of Palms to Seattle to be near family. Although he misses the interaction with colleagues, he is enjoying his retirement.

Tanecia Mitchell (PhD, MacMillan-Crow) was promoted to Assistant Professor in the Department of Urology at University of Alabama at Birmingham. She was awarded a 5-year NIH K01 to study the role of immune cells in kidney stone disease.

Chris Moore (PhD, Rhee) is an FDA Commissioner's fellow at NCTR.

Emily Reichard (PhD, Peterson) is pursuing her pharmacy degree at UAMS.

Martin Ronis (Faculty) is Professor of Pharmacology and Therapeutics in the College of Medicine at Louisiana State University. His R01 was renewed from NIAAA and converted into a MERIT award.

Joan Runnels (Administration) is staying busy in her retirement by working two days per week at REMAX Real Estate, volunteering with community organizations and her church, and spending time with family and friends.

Kathryn Seely (PhD, Prather; postdoc, Mayeux) was promoted to Section Director at the Arkansas Department of Health in Little Rock.

Sharda Singh (Faculty) is an Assistant Professor in the Department of Internal Medicine at Texas Tech University in Lubbock, TX.

Swapnil Sonkusare (PhD, Rusch) is a tenure-track Assistant Professor at University of Virginia (UVa) Charlottesville. He and his wife welcomed a son (Neil) in November 2016.

Anup Srivastava (PhD, Rusch) is working for the FDA as a Toxicology Reviewer in the Office of New Drugs (OND), Center for Drug Evaluation Research (CDER).

Misty Thompson (PhD, Crow) became a Certified Clinical Research Professional through SOCRA and is working for the UTHSC Institutional Review Board as a compliance advisor.

John Wedig is still shooting competitively action pistol, 3 gun and skeet. He is fishing for rainbow trout in the Ozarks at Rockbridge, MO., although his wife, Rita, catches more fish than he does. They recently travelled to South America to see the Inca, Wari, Chanchan archeological sites in Peru and spent a week in the Sacred Valley looking at Inca ruins.

ALUMNI and OTHER FRIENDS (PREVIOUS UPDATES)

Bill Allaben (NCTR) recently received the FDA's Lifetime Scientific Achievement Award for his lasting contribution to the advancement of regulatory science.

Rais Ansari (Research Assistant, Gandy) is an Assistant Professor in the College of Pharmacy at Nova Southeastern University in Fort Lauderdale, FL.

Will Atchley (PhD, Owens) is a resident in the Department of Internal Medicine at UAMS.

January Baumgardner (PhD, Ronis) is a lecturer at Ouachita Technical College in Malvern.

John Bowyer is in the Division of Neurotoxicology at NCTR.

Venkata Bhogaraju (PhD, Crow) is a pharmacist at Walmart in Moses Lake, WA.

Angela Burke (PhD, Hinson) is a Surgical in vivo Biocompatibility Supervisor at North American Science Associates (NAMSA).

Dian Cao (PhD) is currently a Staff Cardiologist, Assistant Professor of Internal Medicine, Cardiology Division, UT Southwestern Medical Center.

Louis Chang is retired and serves as visiting staff to help National Health Research Institutes and the Taiwan government on various issues.

Krishna Chimalakonda (PhD, Moran) is a Scientist in the Division of Drug Safety Research (DDSR), Center for Drug Evaluation Research (CDER), US FDA.

Danielle Cruthirds (PhD, Macmillan-Crow) is an Associate Professor in the Department of Pharmaceutical Sciences at McWhorter School of Pharmacy, Samford University.

Brian Cummings (Postdoc, Schnellman) is Director of the Interdisciplinary Toxicology Program at the University of Georgia.

Helen Cunny (PhD, Slikker) is working for the NIEHS in Research Triangle Park, NC as a Project Officer in the area of reproductive and developmental toxicology.

Jaclyn Daniels (PhD, Wessinger) is a postdoctoral fellow at NCTR.

Linval DePass (PhD, Morris) is President of the Hispanic Organization of Toxicologists (Society of Toxicology). She is Executive Director, Nonclinical Safety at Direct Corporation.

Greg Davis (Technician, Wessinger) is a Desktop Support Engineer for the IT department at UAMS. He is in school pursuing entrance to nursing school.

Rob Dorman (PhD, Brock) lives in Bentonville, where he is a general surgeon at Mercy Hospital in Rogers.

Malvin Driver is Chief of Retina Service, South Texas Veteran's Healthcare System in San Antonio, TX. He is teaching ophthalmology to residents from UTSA.

Gloria Gabriel (Administration) runs Gigi's Cake Boutique in Sherwood, AR.

Brenda Gannon (PhD, Fantegrossi) is a postdoctoral fellow at the University of Texas, San Antonio.

Yun Ge (PhD, Light) works at the FDA/CDRH/OIVD as a scientific writer.

Karen Gilmore-Thomas has a 4-year old granddaughter and a new grandson.

ALUMNI and OTHER FRIENDS (PREVIOUS UPDATES)

Angela (Disch) Gray (PhD, Ali) is the Clinical Business Solutions Analyst with Mercy Health Systems in Fort Smith.

Stephanie Hastings (Technician, Stimers) is a nurse anesthesiologist at Great Rivers Medical Center in West Burlington, IA.

Howard Hendrickson (Postdoc, Owens) was awarded tenure in the Department of Pharmaceutical Sciences at UAMS.

Dinesh Hinenallur (PhD, Rusch) is a Laboratory Animal Veterinarian at the Amgen in Thousand Oaks, CA.

Joseph Hunter Holthoff (PhD, Mayeux) is a resident in the Department of Internal Medicine at UAMS.

Tom Hudzik is a Volweiler Research Fellow with Abbott/AbbVie, which is an emeritus, director-level position.

Dae Song Jang (PhD, Basnakian) is a postdoctoral fellow at the University of Florida.

Scott Jarmer (MS, Harbison) is a pathologist in Wichita, KS.

Biny Joseph (PhD, Rusch) is a Grant Program Manager in Neuro-oncology Research, a department of the University of Texas MD Anderson Cancer Center.

Sujay Kharade (PhD, Rusch) is a Research Fellow in the Anesthesiology Research Division at Vanderbilt University Medical Center.

Anthony Kiorpes (NCTR) is “semi-retired”, but lecturing at the University of Minnesota, serving as Associate Editor for the journal *Toxicology and Industrial Health*.

Charlotte Lemmonds is working for Bayer Consumer Care.

Mark Levi (Postdoc, Crow) is a pharmacologist at the Center for Biologics at the FDA.

John Lipscomb (PhD, Slikker) presented the keynote address on health risk assessment at Kansas University Medical Center’s annual John Doull Symposium.

Xiuli Liu (PhD, Mayeux) is a GI pathologist, Full Professor of Pathology and Director of GI and Liver Pathology at the University of Florida in Gainesville.

John Marecki (Faculty) is an Instructor in the Department of Biochemistry and Molecular Biology at UAMS.

Beth Maris teaches AP Chemistry at Little Rock Central High School.

Alessandra Milesi-Hale (PhD, Owens) is a child neurologist at Miami Children’s Hospital.

Shankar Munasamy (PhD, MacMillan-Crow) is an Assistant Professor at Qatar University.

Meagan Myers (PhD) reports a new addition to her family, Sloane Winter Myers.

Nisha Nanaware-Kharade (PhD, Peterson) is a pharmacokineticist, Clinical Pharmacology Division, Pharmaceutical Product Development, LLC.

Paul Nony (PhD, Schnellmann) is a partner at the Center for Toxicology and Environmental Health, LLC.

ALUMNI and OTHER FRIENDS (PREVIOUS UPDATES)

Andrew Norwood (PhD, Fantegrossi) is a student at Bowen School of Law in Little Rock.

James Oldham (PhD, Cave) is retired and babysitting seven grandchildren.

Edith Parker (Administration) is a Program Coordinator in the Division on Nephrology, Department of Internal Medicine at UAMS.

Naeem Patil (PhD, Mayeux/MacMillan-Crow) is a postdoctoral fellow at Vanderbilt.

Elina Pathak (PhD, Mayeux) is a research scientist at Reliance Life Sciences in Mumbai.

Asif Pathan (PhD, Rusch) is a postdoctoral fellow at the University of Louisville.

Merle Paule is a Professor at the National Center for Toxicological Research.

Aleksandra Pesic (Research Associate, Rusch) is in cancer research at Toronto General/Princess Margaret Hospital.

Tonya Rafferty (Research Assistant, Palade) is a Research Assistant in the UAMS Department of Neurobiology and Developmental Sciences.

Maheswari Rajasekaran (PhD, Prather) returned to her native India following graduation.

Jennifer Gibson Schnellmann (PhD, Schnellmann) is an Associate Professor in the College of Pharmacy at the University of South Carolina.

Bernard Schwetz (former Director, NCTR) is living in Taiwan and working as an English editor for an academic health center.

John Seng (PhD, Gandy/Leakey) is Assistant Research Professor at UAMS and BARBA Program Manager.

Jennifer Shoemaker (PhD, Prather) is owner and a science writer with Flourish Medical Writing based in Nashville.

Rohit Singal (PhD, Ronis) is a research scientist with Sanofi U.S. Inc., in Framingham, MA.

Manish Tiwari (PhD, Mayeux) is a physician/researcher at University of Nebraska at Omaha.

Linda Traylor (PhD, Mayeux) is Senior Director of Scientific Affairs at The Binding Site, Inc.

Barbara Vogt (PhD, Mattison) has a consulting practice, Tox Focus LLC, and is Adjunct Assistant Professor in the Fay W. Boozman College of Public Health, and guest lecturer.

Rick Wiese (PhD, Kadlubar) is Head of Production for EMD Millipore in St Charles, Missouri.

Zhen Wang (PhD, Mayeux) is a postdoctoral fellow at the University of Mississippi Medical Center.

Sarah White (PhD, Owens) is teaching chemistry at Arkansas Technical College at Ozark.

Linnzi Wright (PhD, Paule) works at the US Army Edgewood Chemical Biological Center, Toxicology and Obscurants Division, Aberdeen Proving Ground, MD.

Liping Wu (PhD, Mayeux) is Associate Manager of Regulatory Affairs at Johnson & Johnson in Singapore.

Xinwen (James) Yu (PhD, Kennedy) continues his quest of personalized medicine for cancer therapy while working at Dako, an Agilent company, in CA.

Do you have contact information for these alumni?

Adams, Robert Johnson	Li, Jin
Adatsi, Felix K	Lu, Song
Barfield, Lisa	Marvin, Peter Michael
Baron, Scott	Matthews, Anthony Michael
Bever, Ronnie Jo, Jr.	Medlock, Kevin Lawrence
Blackall, Doug	Merritt, James M
Butler, Mary A. Stromberg	Mitchell, Benjamin E
Chapman, John Raymond	Montague, D. C. Eckman
Chen, Genfu	Morrison, David R
Chou, Hsien-Chang	Murphy, Bruce Edward
Clevenger, Martha Ann	Partridge, Jennings E
Cohen, Harold Gene	Plowchalk, David R.
Cole, Troy W	Rastogi, Santosh
Dauback, Sarah D	Richtarik, Alfred A
Fadhel, Nawzad	Rock, Tara
Frame, Lynn T	Schiefer, Mark Anthony
Gaar or Garr, Kermit A	Schmid, Jack Robert
Garcia, Linta	Selders, Marie
Griffin, Joseph	Si, Ying
Hall, Benjamin H	Stone, William Tyler
Hart, Ronald	Vadlapatla, Rajesh
Hastings, Stephanie	Vertino, Anthony
Henry, Berch Eugene	Watts, Dennis R
Huey, Sally	Williams, Richard Franklin
Jerram, David C	Williamson, Anthony Paul
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William Fantegrossi, PhD, Associate Professor

Paul Gottschall, PhD, Professor

Nancy Gray, PhD, Professor

Michael Hambuchen, PhD, PharmD, Instructor

Lee Ann MacMillan-Crow, PhD, Professor

Jeffery Moran, PhD, Assistant Professor

Shengyu Mu, PhD, Assistant Professor

Michael Owens, PhD, Professor

Philip Palade, PhD, Professor

Nirmala Parajuli, PhD, Instructor

Eric Peterson, PhD, Associate Professor

Paul Prather, PhD, Professor

Sung Rhee, PhD, Associate Professor

Joseph Stimers, PhD, Professor

Fang Zheng, PhD, Associate Professor

Departmental Staff

Fred Goad, Departmental Administrator

Sharon Farris-Hester, Procurement Specialist

Pam Kahler, Executive Assistant

Mary Ortiz, Education Specialist

Emeritus Faculty

Donald McMillan, PhD, Former Chair and Professor Emeritus

Jack Hinson, PhD, Distinguished Professor Emeritus

Galen Wenger, PhD, Professor Emeritus

W. David Wessinger, PhD, Professor Emeritus

Piotr Zimniak, PhD, Professor Emeritus