Shirley ShiDu Yan earns Prestigious Dolph Simons Research Award

Dr. Shirley ShiDu Yan was recently honored with the Dolph Simons Research Award in the field of Biomedical Sciences. This award is given in recognition of research achievement in the biomedical sciences to an individual who has had a major and substantial impact and whose work has been of national or international interest, considered profoundly seminal in nature, and representing a productive record of significant research. The Dolph Simons Research Award is one of four Higuchi—University of Kansas Endowment Research Achievement Awards and is the University’s highest award for faculty accomplishments in research, scholarship, and creative activity. It includes a citation and a $10,000 award for ongoing research efforts. The previous Chairman of Pharmacology & Toxicology, Dr. Elias Michaelis, received this award in 1992. The awards were established through the generosity of the late Regents Distinguished Professor Takeru Higuchi and his wife, Aya Higuchi, along with the Endowment Association.

NOTE FROM THE CHAIR

Nancy Muma
Professor, Chair

The Department and graduate program have had another terrific year. We have begun the distance M.S. degree program with our first student and are excited about recruiting additional applicants into the program. If you or someone you know is interested in the distance program, please contact the Department. This year we matriculated seven new graduate students into our onsite program. Six students graduated this year, four with a M.S. degree and two with a Ph.D. Two new faculty members joined the Department, Jim Tracy and Jai Subramanian, while two faculty, Jeff Staudinger and Alex Moise, moved on to other positions. Alex Moise moved back to Canada taking a faculty position at the Northern Ontario School of Medicine. Jeff Staudinger moved to Missouri to help establish the new Joplin campus branch of the Kansas City University of Medicine and Biosciences. We will recruit a new faculty member to the department this year to begin to replenish our ranks.

This is just a brief summary of some of the activities in the Department; you can find more details in the rest of the newsletter. I hope you enjoy hearing about the department and invite you to contribute an update about yourself for our next newsletter. Please contact us about visiting the department this year. We would love to have you give a scientific seminar or a “Beyond the Lab” talk about scientific careers outside of academics.

Distance M.S. Program kicks off

We’re happy to announce that we have enrolled our first Distance M.S. student for Fall 2017. Our faculty continue to design and build additional courses for the program, which is designed to train individuals in molecular, cellular and organ systems pharmacology and toxicology. It was established to provide advanced scientific knowledge in pharmacology and toxicology to those seeking additional academic qualifications to advance at their place of employment or increase their competitiveness for admission to other graduate or professional degree programs. All courses are offered online to provide an opportunity for students to work toward the degree regardless of their location, work schedules, or family obligations. Students will work with two primary research advisors, one at their remote site and one graduate faculty of the Department of Pharmacology and Toxicology. Both research advisors oversee the formulation and progression of the thesis research project.

The program requires 30 total hours; 14 credit hours of online didactic coursework plus 16 credit hours of research activity, research proposal and final written thesis. In order to conduct research for a Master’s thesis project, Distance M.S. students need to have access to a “wet” lab in which they can perform biologically-based experiments. The research activity is normally conducted at the student’s workplace under the supervision of the offsite advisor in collaboration with and guidance from a willing KU research advisor selected from the Pharmacology and Toxicology faculty. If you know of any colleagues who might benefit from this program, please send them our way. We welcome applications from all qualified industrial scientists and students. Additional information can be found on our website: pharmtox.ku.edu/distance-master-science-degree-pharmacology-and-toxicology.
NEW FACULTY

JAICHANDAR SUBRAMANIAN

Dr. Subramanian joins us after completing a Postdoctoral Fellowship at the National Institutes of Health and a position as a Research Scientist at the Massachusetts Institute of Technology. He earned a Fellows Award for Research Excellence and a Visiting Fellowship from the NIH as well as a Department of Biotechnology Fellowship from the government of India. He earned his PhD in Molecular Biology from the University of Southern California, and his MSc in Biotechnology from the University of Baroda in India.

Dr. Subramanian’s research focuses on synaptic plasticity, learning and memory, neurodegenerative disorders and cognition. He has recently concentrated on in vivo imaging of synaptic dynamics in mouse visual cortex. He co-developed a synaptic labeling and two-photon imaging strategy that allows visualization of three different fluorophores simultaneously, enabling the parallel tracking of excitatory and inhibitory synapse dynamics in the same neurons. His work has contributed to the understanding of fundamental differences in the synaptic remodeling properties of excitatory and inhibitory synapses. He uncovered that CPG15, a membrane anchored protein expressed in an activity dependent manner, acts to link animals’ experience with synapse stabilization.

He plans to apply the imaging technologies to address two major questions - Do quiescent neurons contribute to memory storage and whether and how selectivity of synapse loss is determined in mouse models of Alzheimer’s disease.

JAMES TRACY

Dr. Tracy joins the Department of Pharmacology and Toxicology after serving as Vice Chancellor for Research at KU since April 2015.

Before joining KU, Dr. Tracy served for 24 years in administrative positions and faculty roles at the University of Wisconsin-Madison. Prior to that, he was as a research associate at Case Western Reserve University.

Dr. Tracy’s research has focused on the metabolism of xenobiotics in invertebrates and the biochemical mechanisms of anthelmintic action and resistance.

BEYOND THE BOOKS LENDING LIBRARY

NEW INITIATIVE PROVIDES HOUSEHOLD ITEMS FOR STUDENTS

The Pharmacology and Toxicology Department launched a new initiative aimed at assisting new graduate students, particularly international students, as they arrive in Lawrence and set up their apartments. The “Beyond Books Lending Library” is a pantry of gently-used household items, collected and distributed by the department, for our graduate students to use while in residence at KU. Items that have been requested by graduate students include desks, chairs, lamps, light bulbs, small kitchen appliances (eg: microwaves, coffee pots, blenders, toasters, etc.), pots, pans, plates, bowls, mugs, glasses, forks, knives, spoons, clothes hangers, small plastic boxes for organizing clothes and jewelry, mattresses, couches and chairs.

If you are in the area and would like to donate any household items that you no longer need, please contact Sarah Hoadley at sarahhoadley@ku.edu. Many thanks to everyone who has donated and supported our graduate students!

Student organization encourages interest in STEM

The Pharmacology & Toxicology Graduate Student Organization hosts monthly luncheons and campus events to encourage interest among school-aged children in STEM fields. The GSO plans to continue supporting presentations, conferences, and fellowship applications for graduate students in the department.

In May, it hosted a networking and job skills seminar that included a presentation by KU Career Center staff. The GSO leadership team includes Erika Northcutt (President), Khushboo Kapadia (Vice President), Sukhmanjit Kaur (Secretary) and Mohammed Almutairi (Treasurer). Dr. Liqin Zhao is the faculty advisor.

The GSO sponsored a “Girls in STEM” event at KU in April that included a visit from the Katherine Johnson Scholars Sisters. The K-5th grade girls from the Build and Rebuild Math Academy in Wichita are supported by the National Society of Black Engineers. Members study algebra and prepare for the ACT/SAT and are encouraged to pursue these interests by taking additional math courses in high school and college. The GSO arranged for the Katherine Johnson Scholarship Sisters to visit pharmacology, geology, engineering, and math labs on campus, as well as attend the Graduate Research Competition. The event concluded with a visit to the KU Natural History Museum. Support for the event also came from the Multicultural Student Government, Office of the Chancellor, Office of Graduate Studies, Higuchi Bioscience Center, KU Memorial Union, and Hyvee.
KU School of Pharmacy fourth in nation in NIH Funding

The KU School of Pharmacy is ranked No. 4 in the nation in National Institutes of Health funding, marking the 22nd consecutive year the school has been in the top 10. The School of Pharmacy earned more than $16 million in NIH research funding in fiscal year 2016 — an increase of $4.5 million from the previous year’s total. The NIH is a primary source of federal funding for pharmacy schools, and NIH funding is looked at as a key indicator of the productivity and quality of a school’s faculty. KU is the only Big 12 institution in the top 10. The average funding amount per faculty member also increased in 2016. The 25 NIH-funded faculty members brought in an average of more than $640,000 each, an increase from last year of about $100,000 per member.

“Elite pharmacy researchers from across the country compete for this money year after year,” said Ken Audus, dean of the School of Pharmacy. “The fact that we are consistently among the nation’s most successful speaks to the talent and expertise of our faculty. It’s something that they and the state of Kansas should be very proud of.”

The ranking is based on data collected and posted by the American Association of Colleges of Pharmacy.

NEWS FROM THE LAB

Yan Lab / The Yan lab received a new five-year NIH grant to investigate the role of mitochondrial import machinery in mitochondrial and synaptic degeneration in Alzheimer’s disease. Dr. ShiDu Yan served as section chair for the Molecular & Cell Biology: Metabolic and Other Cellular Processes in Neurodegeneration panel at the 2017 Alzheimer’s Association International Conference (AAIC) in London. She was also invited to present a seminar, Alterations in Mitochondrial Network Contribute to Synaptic Dysfunction in Diabetic Alzheimer’s Disease Mouse Model at the AAIC.

Zhao Lab / Research conducted by the Zhao lab was selected as a “hot topic” and included in the Society for Neuroscience 2016 Hot Topics Book in November 2016. The title was “Human ApoE ε2 promotes regulatory mechanisms of bioenergetic and synaptic function in female brain: a focus on V-type H+-ATPase.” Additional research titled “Sex on the brain: Unraveling the differences between women and men in neurodegenerative disease” was featured in Nature Medicine in December 2016: nature.com/nm/journal/v22/n12/full/nm1216-1370.html?foxtrotcallback=true.

The Zhao lab enjoyed enormous good fortune last spring, when it was awarded three separate grants on a single day, including an NIH/NIA R21AG055964, a K-INBRE Bridging Grant, and a J.R. and Inez Jay Fund grant.

Shi Lab / The Shi lab received a KU GRF grant for a project entitled “Hepcidin as a therapeutic target in stroke.”

Faiman Lab / Morris Faiman received a Tonix Pharmaceuticals grant for a project entitled “Preliminary Studies on Carbamathione, a Potential Anti-Alcohol Agent.”

DOBROWSKY LAB

WILL A CHAPERONE ESCORT US TOWARD A TREATMENT FOR DIABETIC PERIPHERAL NEUROPATHY?

The etiology of diabetic peripheral neuropathy (DPN) involves an inter-related series of metabolic insults that impair mitochondrial function and ultimately contribute to sensory neuron degeneration. In complex, chronic neurodegenerative diseases such as DPN, it is increasingly appreciated that effective disease management may not necessarily require targeting a pathway or protein considered to contribute to disease progression. Alternatively, it may prove beneficial to pharmacologically enhance the activity of endogenous neuroprotective pathways to aid neuronal recovery and tolerance to ongoing diabetic stress. To this end, we have synthesized novel small molecules that activate an endogenous cytoprotective response by inhibiting the molecular chaperone, heat shock protein 90 (Hsp90). Hsp90 is the master regulator of the cytoprotective heat shock response, which upregulates expression of Hsp70 and antioxidant genes. In collaboration with Dr. Brian Blagg in the Dept. of Medicinal Chemistry, our groups identified molecules called novologues as non-toxic, bioavailable molecules that potently reverse multiple clinical indices of DPN, promote the recovery and reinnervation of damaged sensory fibers into the epidermis, increase mitochondrial bioenergetics and decrease oxidative stress in models of Type 1 and Type 2 diabetes. Thanks to efforts of the KU Technology Transfer Office, in 2014 we signed a licensing agreement with Reata Pharmaceuticals for advancing novologues toward clinical applications in treating human neurodegenerative diseases. In the ensuing period, the company aggressively pursued and financially supported the necessary studies to submit an Investigational New Drug Application (IND) to the Food and Drug Administration (FDA) in 2016. The FDA allowed the initiation of a Phase I clinical study in 2017 to assess the safety of single and multiple doses of our lead novologue in humans. These studies have been completed and final results are pending on whether the clinical data supports initiating a Phase II trial in 2018 to assess efficacy in treating human DPN. We are very excited and hopeful that the efforts of many years of work may result in a first in class treatment for human DPN.
After receiving my degree in Pharmacy from the Sun Yat-sen University in China, I was presented with two paths: to work as a marketing representative and climb up the career ladder in a booming industry in Shenzhen, (which has become an international hub for technological innovation); or come to the States for a graduate degree in biological science. It wasn’t an easy choice, but I chose the path that I felt best challenged me. I also picked it with the belief that 21st Century is going to be the Century of Biology. And I was right! Just look at the human genome editing news hitting the headlines of major media nowadays.

So not knowing anything about Kansas—the heartland of the United States—with two large suitcases I found myself standing at the Kansas City airport, and waiting for a fellow graduate student from Dr. Nancy Muma’s lab to pick me up. To be honest, transitioning from a big city to a small town like Lawrence was a huge challenge for me. I was used to having everything within walking distance to go along with a great public transportation system and the hustle and bustle of city life. However, being in Kansas provided me with peace and tranquility, which was exactly what I needed to pursue a PhD degree. And better than that, Dr. Rick Dobrowsky made sure I was working my butt off in the lab.

After a semester of rotation, I decided to join Dr. Dobrowsky’s lab, which offered me a fascinating opportunity to study the intersection between diabetes and neuroscience. If you ask anyone who has worked toward a PhD in biology, they will tell you that it involves countless, heartbreaking, and repeated hits to morale when your experiments don’t work or your hypotheses get trashed. But it is also rewarding when you learn something new from the failure, or discover something you didn’t expect—it’s the beauty of science!

Another aspect that made my PhD study particularly enjoyable was the people at P&TX. Everybody was warm, friendly, and helpful. I never had a difficult time borrowing reagents from other labs when my own supplies ran out. I was always able to receive immensely helpful technical and scientific advice from Drs. Muma and Moise, and other faculty in P&TX when I was running into roadblocks during my research. Most of all, I had a tremendous mentor! Though often with a sense of sarcasm like, “You are a PhD student and you can’t figure this out on your own?” Dr. Dobrowsky honored my capabilities and gave me the freedom to take ownership of a project. He is the kind of mentor who regularly performs experiments himself in the lab (i.e. getting in the way of graduate students and postdocs) and comes to you to bounce ideas around. More importantly, Rick provided me with the opportunity to participate in important paper and grant-writing processes, which were extremely valuable experiences and proved to be useful at every job I’ve held since. That takes me to where I am now—at the Office of Science Policy within the Office of the Director at NIH.

At the nation’s biggest biomedical research entity, I have the amazing opportunity to help NIH leadership decide and deliver important research policy. In addition to developing evidence-based policies in important areas, such recombinant DNA and stem cell research, I am also enjoying learning the new and emerging technologies as well as keeping NIH informed and prepared for congressional and public inquires. Here, every little bit I learned through P&TX helps me do my job. There’s no doubt that my experience with teaching the “gene therapy” courses in Dr. Dobrowsky’s classes at KU helps when I review dozens of human gene transfer protocols submitted to NIH every week.

My journey on this path is still ongoing, and I don’t know where I will land next. One thing I’m sure of is that no matter where I land, I will always be grateful for the knowledge and experience I obtained through P&TX, the place where I started. I hope you will enjoy yours there as well!
PHARMACOLOGY & TOXICOLOGY FACULTY PUBLICATIONS


NEW GRADUATE STUDENTS

Smruti Gore is a master’s student from the Inidira College of Pharmacy at Savitribai Phule Pune University in Maharashtra, India. She earned a B. Pharmacy in 2016, graduating first in her class, and wrote a thesis titled “Preparation and evaluation of tablets of Metformin Hydrochloride in combination with Compound SAGE21.” Smruti plans to study cellular communication and neurodegeneration for widely prevalent diseases such as diabetes and has joined the lab of Professor ShiDu Yan. She became interested in Neuropharmacology as an undergraduate, when she worked on a project related to the field of diabetic neuropathy. She is interested in the field of diabetes and neuropathic pain and looks forward to exploring more areas of neurodegeneration.

Luanne Hale joined our master’s program after completing her undergraduate studies at KU. She received a B.S. in Applied Behavioral Science and wrote an honor’s thesis titled “Delayed Reward Value in Animal Models of Obesity.” She was awarded the KU Marigold Linton Scholarship and participated in the Initiative for Maximizing Student Development Program for her final two undergraduate years. She has joined the lab of Professor Adam Smith and will study the effects of social defeat in prairie voles (Microtus ochrogaster) and use this as an animal model of affective disorders. She is interested in the onset of social anxiety associated with social defeat in prairie voles and exploring the efficiency of treating both behavioral symptomology and underlying neuroendocrine deficits with current antidepressants/anti-anxiety medications as well as signaling peptides.

Lucy He is a new master’s student working in Professor Liqin Zhao’s lab. She recently completed a B.S in Behavioral Neuroscience here at KU, where she worked as a research assistant in multiple labs across the university, studying the neurocognitive development of autism, cognitive neuroscience as well as pharmacology. As an undergraduate, Lucy developed a strong interest in neurodegenerative diseases, specifically Alzheimer’s disease and studied the behavioral effects of the disease. She is now excited to investigate the molecular side of the disease and is currently investigating the role of ApoE4 in Alzheimer’s disease. Her primary research focuses on the role of V-ATPase on synaptic transmission.

Beichen Jiang joined the Master’s program after receiving his B.S. in Pharmacy from Shanghai Jiao Tong University in 2016, where he wrote a Bachelor’s thesis titled “The Screening of Anti-inflammatory Substances in Traditional Chinese Medicine.” He recently worked as a Project Manager Assistant in the Shanghai Innovation Research Center – Traditional Chinese Medicine. Beichen joined the lab of Professor Jackob Moskovitz here at KU and plans to study aging, age-related diseases, and the oxidative damage to proteins that is reported to cause these diseases. In particular, he is interested in studying the mechanisms behind oxidative damage to proteins.

Shreya Indulkar entered the Master’s program after earning a B. Pharmacy degree from Dr. Bhanuben Nanavati College of Pharmacy in Mumbai, India in 2016. She completed an internship at TEVA Pharma, Goa and worked at Sorento Heathcare before joining Professor Jai Subramanian’s lab. She is particularly interested in using two photon imaging to understand the structural changes that occur inside our brains during neurodegenerative conditions.

Siying Li is a new Master’s student working in Professor Honglian Shi’s lab. She completed a B.S. in Pharmacy at Xinhua College of Sun Yat-sen University in Guangzhou, China in June 2017, where she conducted research on the effect of chlorpromazine on carbon monoxide poisoning in mice. Siying has held internships at the Guangdong Institute of Chinese Medicine Engineering and Technology and at Second Chinese Medicine Hospital of Guangdong Province. Her undergraduate research about hypoxia of mice has led to an interest in researching hypoxia as part of her graduate studies.

Sugandha joined our Master’s program after completing a B. Pharmacy degree at the University Institute of Pharmaceutical Science at Panjab University in Chandigarh, India. As an undergraduate, she took part in a pharmacovigilance project initiated by the World Health Organization and trained with Knox Life Sciences, a pharmaceutical company. She is interested in pursuing her study of pharmacology, neuroscience and pharmacovigilance here at KU.
ALUMNI NEWSLETTER

GRADUATING STUDENTS
We were proud to see several graduate students complete their degree requirements and move on to new programs, positions & adventures since the last issue of our newsletter.

ANIDIT (ANDY) CHHIBBER
Andy is a summer 2016 graduate of our M.S. program who spent the past year working as a research assistant in Professor Liqin Zhao’s lab. He recently entered the Ph.D. program in Pharmacology at the University of Utah.

AMANDA LADD
Amanda received her M.S. in winter 2016 and is currently working as a Microbiology QA Analyst at Alcon, a Division of Novartis, in Texas.

WENQI CUI
Wenqi received her Ph.D. in spring 2017 and is currently working as a postdoctoral researcher in the Department of Biochemistry, Molecular Biology and Biophysics at the University of Minnesota.

YUE (ALVIN) DENG
Alvin received his M.S. Spring 2017 and is now enrolled in the Ph.D. program in Pharmacology at the University of Iowa.

XUNAN SHEN
Xunan received her M.S. in Spring 2017 and is now enrolled in the Ph.D. program in Pharmacology at the University of Georgia.

YUSHENG LI
Yusheng received his M.S. in Summer 2017 and is now enrolled in the Ph.D. program in Pharmaceutics at the University of Mississippi.

LONG WU
Long received her Ph.D. in Summer 2017 and is currently working as a postdoctoral researcher at the University of California San Francisco.

THANK YOU FOR YOUR SUPPORT
Thank you for your interest in supporting the Department of Pharmacology & Toxicology. Private support allows the department to provide resources for students, establish research seminars, and continue the excellence you have come to expect from our department.

Your support, regardless of size, can make a profound impact. Even small amounts given over time can accumulate to create substantial resources for the department. For a lasting impact on the department, major gifts can establish endowed funds that can be named for you or for someone else and provide financial support in perpetuity. Visit our website pharmtox.ku.edu or contact our director of development Sophie Lamb at slamb@kuendowment.org or 785-832-7476 to make a donation.

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