

GRADUATE PROGRAM IN PHARMACEUTICAL SCIENCES

The **Pharmaceutical Sciences PhD Program** at the University of Wisconsin-Madison School of Pharmacy provides a rigorous background in scientific disciplines that are critical to the preparation of the next generation of pharmaceutical scientists. With approximately 30 faculty trainers and approximately 65 graduate students, the program's interdisciplinary training combines pharmaceutically relevant aspects of classical disciplines such as chemistry, biology, and engineering. Students earn a PhD in Pharmaceutical Sciences, concentrating in one of three research cores: Drug Discovery, Drug Action, or Drug Delivery.

Recent program graduates have found employment in a variety of industrial settings or in prestigious postdoctoral academic research labs. Opportunities in research and development roles for pharmaceutical, biotechnology, chemical, contract research, healthcare, and other innovation-minded companies are common post-graduate paths. Some graduates achieve faculty positions at colleges or at larger research institutions. By partnering with the Graduate School's Office of Professional Development and other units on campus, we have increased student and career services such that Pharmaceutical Sciences graduate students can sharpen their professional and communication skills and reach a larger network of potential employers. The program graduated 35 PhDs from 2016-19; 100% of recent alumni were working in their field within six months of graduation.

Research in **Drug Discovery** focuses on areas related to medicinal chemistry, such as small molecule development, natural products isolation and characterization, organic synthesis, chemical biology, and rational drug design.

Drug Action focuses on areas related to pharmacology, toxicology, cellular differentiation, development, and disease. Interests include the impact of drugs and toxins on biological systems, mechanisms of normal biology, and mechanisms of disease. These are studied at the cellular, genetic, molecular, and biochemical levels using diverse model systems.

Drug Delivery emphasizes principles in physical chemistry and drug transport, aiming for advances in formulation, drug targeting, and multi-modal therapy. Delivery research includes biomaterials, blood-brain barrier, cell engineering, immunotherapy, liquid biopsy, molecular recognition, molecular imaging, nanomedicine, pharmacokinetics, and solid-state chemistry.

The UW-Madison Pharmaceutical Sciences Division has been recognized for its research productivity, extramural funding support, publication record, and teaching. The Pharmaceutical Sciences Division is housed in Rennebohm Hall, a seven-story, state-of-the-art facility and home to the School of Pharmacy.

Accepted graduate applicants commonly have strong scientific backgrounds, a passion for research, and significant laboratory experience. Students with undergraduate degrees in the physical or biological sciences, engineering, pharmacy, and related fields are encouraged to apply. UW-Madison is one of the nation's most prolific research universities, located on the shores of Lake Mendota in the state's vibrant capital city.

UW-Madison remains extremely competitive in the national research landscape with high emphasis on the life sciences and basic research. The beautiful, thriving city of Madison is consistently recognized as one of the best cities in multiple categories for quality of life.

Visit grad.wisc.edu to learn more about the many reasons to choose UW-Madison for graduate study.

Contact: Shainah Greene, Graduate Programs Coordinator
(608) 262-3123 | gradadmissions@pharmacy.wisc.edu
Pharmaceutical Sciences Division
University of Wisconsin Madison
School of Pharmacy
777 Highland Avenue
Madison, WI 53705-2222



PHARMACEUTICAL SCIENCES FACULTY

Arash Bashirullah, Associate Professor (Action)

Cellular genetics of animal physiology: uncovering novel genetic and cellular drivers of disease.

Email: arash.bashirullah@wisc.edu

Tim S. Bugni, Professor (Discovery)

Marine natural products chemistry; antibiotic drug discovery and development; structure determination of novel natural products using NMR and mass spectrometry; metabolomics.

Email: tim.bugni@wisc.edu

Lara Collier, Associate Professor (Action)

Genetic and pharmacologic approaches to study disease development and treatment, focusing on cancer and central nervous system diseases.

Email: lara.collier@wisc.edu

Jun Dai, Assistant Professor (Action)

Understanding the transcriptional networks that control keratinocyte proliferation/differentiation and epidermal barrier functions during development and under pathological conditions. Developing novel therapeutic strategies for the treatment of inflammatory skin diseases and skin cancer.

Email: jdai32@wisc.edu

Ting Fu, Assistant Professor (Action)

Study how nuclear receptors sense environmental clues and regulate Gastrointestinal homeostasis in healthy and disease states — specifically, how dietary and microbial induced bile acids are sensed by Farnesoid X Receptor (FXR) and dynamically affect intestinal developmental, differentiation and inflammation, focusing on colorectal cancer and intestinal bowel disease.

Email: ting.fu@wisc.edu

Jennifer Golden, Assistant Professor (Discovery)

Synthetic methodology, medicinal chemistry and drug discovery. Optimization of structure-activity and structure-property relationships. Exploratory pharmacological mining of novel chemical scaffolds. Emphasis on development of anticancer and anti-infective agents.

Email: jennifer.golden@wisc.edu

Seungpyo Hong, Professor (Delivery)

Biomimetic nanotechnology; polymeric nanomaterials; dendritic polymers; targeted drug delivery; cancer immunotherapy; cancer biomarkers; liquid biopsy.

Email: seungpyo.hong@wisc.edu

Richard Hsung, Professor (Discovery)

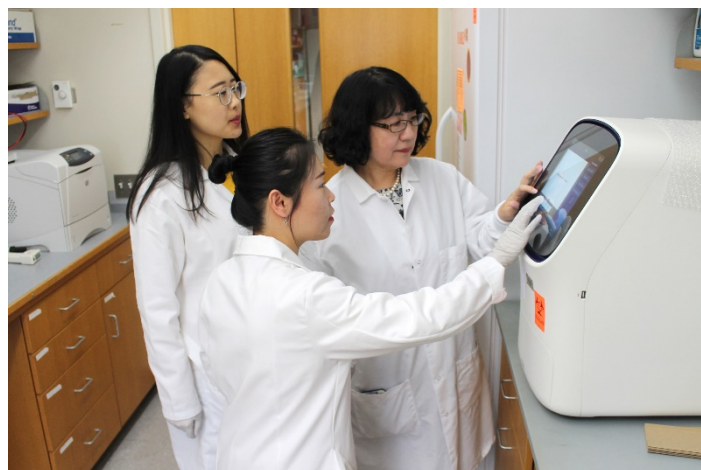
Developing novel and practical synthetic methods for drug discovery; total syntheses of complex natural products with biological relevance; syntheses of de novo protease inhibitors for drug designs and asymmetric catalysis.

Email: richard.hsung@wisc.edu

Jiaoyang Jiang, Associate Professor (Discovery)

Study the mechanism and function of protein post-translational modifications using a variety of interdisciplinary approaches, such as chemical biology, enzymology, biochemistry, mass spectrometry, X-ray crystallography, cell biology, and genetics.

Email: jiaoyang.jiang@wisc.edu



Jeffrey Johnson, Professor (Action)

Signal transduction, transcriptional control of neuroprotective genes and neurotoxicity in Parkinson's, Alzheimer's, Huntington's and Neuromuscular disease.

Email: jeffrey.johnson@wisc.edu

Jason Kwan, Associate Professor (Discovery)

The role of uncultured symbionts in natural product biosynthesis within marine invertebrates and other animals; marine natural products chemistry; drug discovery; next-generation sequencing; metagenomics; bioinformatics; biosynthesis.

Email: jason.kwan@wisc.edu

Glen Kwon, Professor (Delivery)

Polymeric nanomedicines for injection for cancer, fibrosis, and immunotherapy.

Email: glen.kwon@wisc.edu

Quanyin Hu, Assistant Professor (Delivery)

Leveraging delivery approaches to address current clinical challenges and facilitate translational research by integrating cell therapy, immunotherapy, and personalized therapy.

Email: qhu66@wisc.edu

Charles Lauhon, Associate Professor (Discovery)

Biochemistry of RNA modifying enzymes; bioorganic chemistry of RNA; nucleotide-based drug design.

Email: clauhon@wisc.edu

PHARMACEUTICAL SCIENCES FACULTY - CONTINUED

Lingjun Li, Professor (Action/Discovery)

Analytical neurochemistry; neuropeptides; proteomics and peptidomics; glycomics and glycoproteomics; biomarker discovery in neurodegenerative diseases; quantitative system biology; metabolomics; microseparations; imaging mass spectrometry and its application to drug delivery and biodistribution; biological mass spectrometry.

Email: lingjun.li@wisc.edu

Paul Marker, Professor (Action)

Molecular basis of prostate development; prostate cancer progression; benign prostatic hyperplasia; roles of cell-cell signaling pathways and the use of mouse genetics to discover novel pathways that underlie prostatic diseases.

Email: paul.marker@wisc.edu

Sandro Mecozzi, Professor (Delivery/Discovery)

Di- and tri-block copolymers in drug delivery and imaging; 19F-MRI; nanotechnologies in cancer therapy; immunotherapies; molecular recognition of RNA.

Email: sandro.mecozzi@wisc.edu

Jason Peters, Assistant Professor (Action)

CRISPR-based genetic screens in bacteria to improve biofuel production and fight antibiotic resistance.

Email: jason.peters@wisc.edu

Warren Rose, Associate Professor Pharmacy Practice Division (Discovery)

Antimicrobial pharmacology and pharmacodynamics to assess antibiotic resistance and virulence. Combination antibiotic mechanism of action, genetic resistance development, and host-pathogen interactions.

Email: warren.rose@wisc.edu

Steve Swanson, Dean and Professor (Discovery/Action)

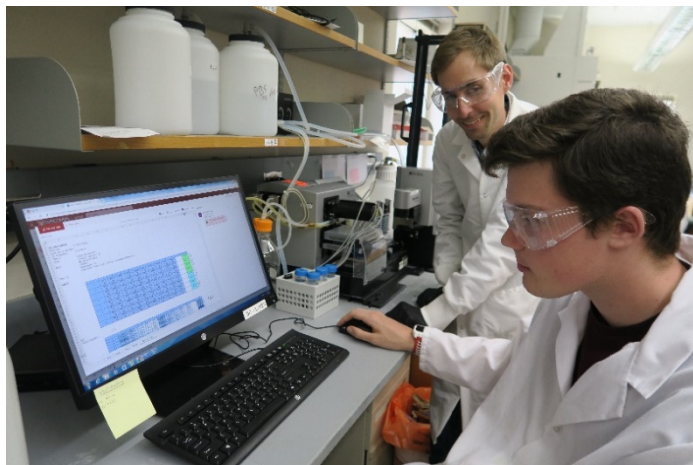
In vitro and preclinical model systems to investigate the role of the growth hormone/IGF-I axis in prostate carcinogenesis.

Email: steve.swanson@wisc.edu

Weiping Tang, Professor (Discovery)

Design and synthesis of small molecules that can selectively degrade disease-causing proteins; development of various cell-based and biochemical assays to evaluate the pharmacological properties of novel small molecules and to study their mechanism of action; design and synthesis of carbohydrate- and peptide-based ligands for lectins.

Email: weiping.tang@wisc.edu



Michael Taylor, Assistant Professor (Action/Delivery)

Regulation of CNS angiogenesis; Blood-brain barrier development; modulation of neuroinflammation; in vivo imaging; zebrafish genetics.

Email: michael.taylor@wisc.edu

Cody Wenthur, Assistant Professor Pharmacy Practice Division (Action)

Discretely identifying how multiple neurochemical systems interact to support maladaptive learning and synaptic plasticity. Development of novel bioconjugates and monoclonal antibodies to probe the effects of synthetic psychoactive substances in mammalian systems; identifying immune-mediated biomarkers of ongoing drug abuse in humans; assessing perceived ethical, practical, and therapeutic barriers to the implementation of novel addiction treatment paradigms within current health systems.

Email: wenthur@wisc.edu

Lian Yu, Professor (Delivery)

Pharmaceutical materials science; solid-state chemistry; amorphous pharmaceuticals; molecular glasses; crystallization; polymorphism; surface mobility; polymeric crystallization inhibitors.

Email: lian.yu@wisc.edu

PHARMACEUTICAL SCIENCES AFFILIATE FACULTY

Weibo Cai, Professor (Delivery)

Biomedical nanotechnology; molecular imaging (positron emission tomography and multimodal); image-guided drug delivery; theranostics; translational research; tumor targeting; cancer diagnosis/therapy; imaging of cardiovascular diseases and diabetes.

Email: wcai@uwhealth.org

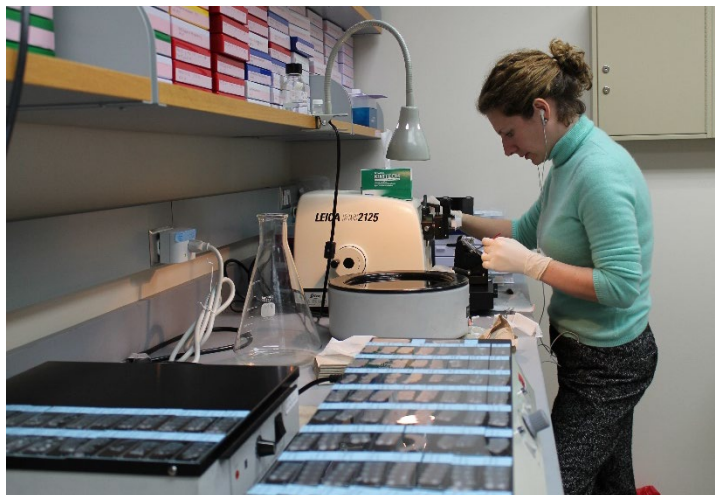
Primary Appointment: Department of Radiology, School of Medicine and Public Health

William Ricke, Professor (Action)

Understanding the molecular mechanisms involved with hormone therapy in the prevention and treatment of urologic cancers and benign diseases. Focus areas include translational research, steroids and small molecules, stromal-epithelial interactions, endocrine disrupting chemicals, and mouse models of disease progression. Prof. Ricke serves as the Director of Research in the Department of Urology.

Email: rickew@urology.wisc.edu

Primary Appointment: Department of Urology, School of Medicine and Public Health



Lauren Trepanier, Professor (Action)

Pharmacogenetics of xenobiotic toxicity, including both therapeutic drugs and environmental carcinogens. Risk factors for idiosyncratic and dose-dependent drug toxicity. Genetic variability in phase II detoxification pathways (especially GSTs and cytochrome b5 reductase) and cancer risk in both humans and dogs.

Email: lauren.trepanier@wisc.edu

Primary Appointment: Department of Medical Sciences, School of Veterinary Medicine

Chad Vezina, Professor (Action)

Molecular basis of prostate and urinary tract development, physiology, and toxicology.

Email: cmvezina@wisc.edu

Primary Appointment: Department of Comparative Biosciences, School of Veterinary Medicine

Jamey Weichert, Professor (Delivery/Discovery)

Design and development of tumor targeted molecular agents for imaging, radiotherapy and immunotherapy oncology applications.

Email: jweichert@uwhealth.org

Primary Appointment: Department of Radiology, School of Medicine and Public Health

