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 over 30 faculty trainers and approximately 60 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-doctoral 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 46 PhDs from 2012-17; over ninety percent 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 the solid state chemistry of drugs, nanopharmacy, biocompatibility, molecular recognition, computational chemistry, pharmacokinetics, and molecular imaging.

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, ranking sixth in research spending among U.S. universities 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  Graduate Programs Coordinator
          gradadmissions@pharmacy.wisc.edu
          (608) 262-4257
          Pharmaceutical Sciences Division
          University of Wisconsin Madison
          School of Pharmacy
          777 Highland Avenue
          Madison, WI 53705-2222

pharmacy.wisc.edu/programs/pharmsci
PHARMACEUTICAL SCIENCES DIVISION FACULTY

Arash Bashirullah, Associate Professor (Action)
Intercellular communication: uncovering mechanisms that coordinate the development of multicellular organisms.
Email: arash.bashirullah@wisc.edu

Tim S. Bugni, Professor (Discovery)
Marine natural products chemistry; antibiotic drug discovery; structure determination of novel natural products using NMR and mass spectrometry; and metabolomics studies of marine invertebrate associated microorganisms.
Email: tim.bugni@wisc.edu

Ron Burnette, Professor and Chair (Delivery)
Developing a molecular level mechanistic understanding of the delivery and stability of drugs by physical chemical characterization of guest-host interactions using computational chemistry and NMR as well as studies in pharmacokinetics and pharmacodynamics.
Email: ronald.burnette@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: jda32@wisc.edu

Jennifer Golden, Assistant Professor (Discovery)
Email: jennifer.golden@wisc.edu

Seungpyo Hong, Professor (Delivery)
Biomimetic nanotechnology; polymeric nanomaterials; dendritic polymers; targeted drug delivery; cancer diagnostics/prognostics; liquid biopsy technology.
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, Assistant 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, Assistant Professor (Discovery)
The role of uncultured symbionts in natural product biosynthesis within marine invertebrates; marine natural products chemistry; drug discovery; next-generation sequencing; metagenomics; bioinformatics; biosynthesis.
Email: jason.kwan@wisc.edu

Glen Kwon, Professor (Delivery)
Pharmaceutical nanotechnology; polymeric micelles; polymeric drug conjugates; PEGylation.
Email: gwen.kwon@wisc.edu

Charles Lauhon, Associate Professor, Vice Chair (Discovery)
Assistant Dean—Graduate Studies
Biochemistry of RNA modifying enzymes; bioorganic chemistry of RNA; nucleotide based drug design.
Email: cluhon@wisc.edu

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, Vice Chair (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 pathogenic bacteria to understand gene function and antibiotic mode of action.
Email: jason.peters@wisc.edu

Steve Swanson, Dean and Professor (Discovery/Action)
Preclinical model systems to investigate the role of the growth hormone/IGF-I axis in prostate carcinogenesis.
Email: steve.swanson@wisc.edu

pharmacy.wisc.edu/programs/pharmsci
PHARMACEUTICAL SCIENCES DIVISION FACULTY - CONTINUED

Weiping Tang, Professor (Discovery)
Medicinal chemistry, carbohydrate synthesis, synthetic methodology, and chemical biology. We use a variety of chemical and biological tools for drug discovery. We are currently interested in studying small molecules that can selectively modulate the stability of disease-causing proteins.
Email: weiping.tang@wisc.edu

Michael Taylor, Assistant Professor (Action/Delivery)
Development and function of the blood-brain barrier;

AFFILIATE FACULTY of the PHARMACEUTICAL SCIENCES DIVISION

Ralph Albrecht, Professor (Action/Delivery)
Use of inductively heated, antibody targeted, core-shell nanoparticles for selective removal of targeted cells in vitro and in vivo. Development of high resolution nanoparticle labeling systems for correlative microscopy.
Email: albrecht@anscl.wisc.edu
Primary Appointment: Department of Animal Science, College of Agricultural and Life Sciences

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

Adnan Elfarra, Professor (Action)
Bioactivation and detoxification of drugs, industrial chemicals, and environmental toxicants; biochemical basis for target organ selectivity; biomarkers of toxicant exposure.
Email: elfarra@svm.vetmed.wisc.edu
Primary Appointment: Department of Comparative Biosciences, School of Veterinary Medicine

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

Colin Jefcoate, Professor (Action)
Physiological mechanisms associated with P450 cytochromes.
Email: jefcoate@wisc.edu
Primary Appointment: Department of Cell and Regenerative Biology, 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. Mechanisms of familial and acquired risk for sulfamethoxazole drug hypersensitivity (“sulfa allergy”). 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

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

OTHER FACULTY TRAINERS

Warren Rose, Associate Professor (CHS) (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
Primary Appointment: Pharmacy Practice Division, School of Pharmacy

Cody Wentthur, Assistant Professor (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: wentthur@wisc.edu
Primary Appointment: Pharmacy Practice Division, School of Pharmacy

School of Pharmacy
UNIVERSITY OF WISCONSIN-MADISON

pharmacy.wisc.edu/programs/pharmsci