

Explore Pharmacology

A Guide for Undergraduate Students

2026 Edition



American Society for Pharmacology
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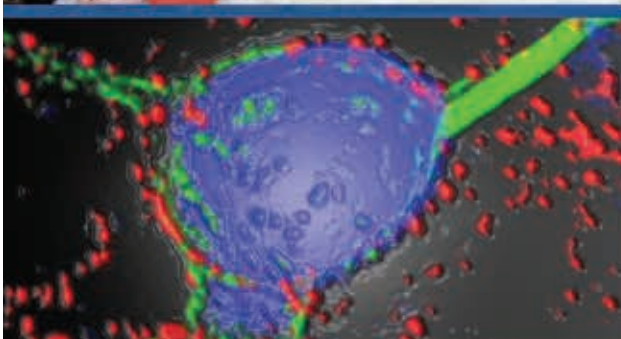
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What is Pharmacology?

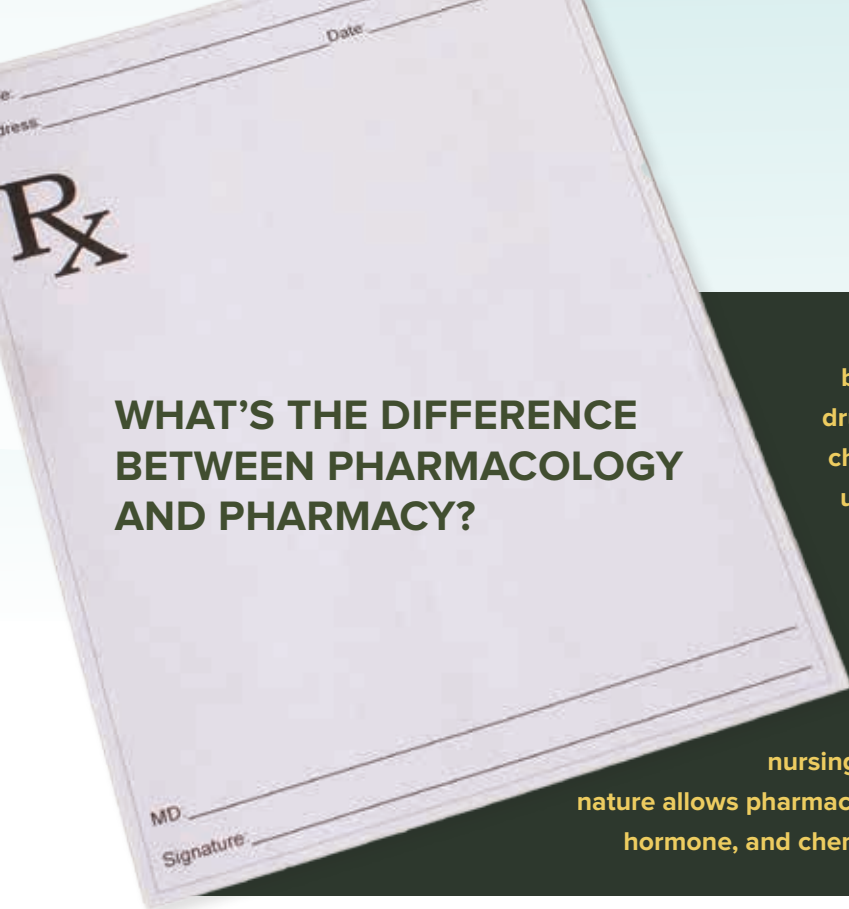
Have you ever wondered why caffeine wakes you up, why some people get drowsy from allergy medications while others don't, or why doctors adjust doses for different patients? Do you have a friend or family member who has benefitted from chemotherapy treatment, or used nicotine patches to help them stop smoking? Or maybe you've noticed the increasing popularity of GLP-1 drugs for weight loss. From the common pain relievers in your medicine cabinet to new cutting-edge treatments, **pharmacology helps explain not only how these substances work, but why they work differently for everyone.**



Pharmacology is all about how drugs interact with your body. For example, when you take ibuprofen for a headache, it works by blocking enzymes involved in inflammation and pain signaling. Caffeine keeps you alert by interfering with adenosine, a chemical that makes you feel sleepy. Allergy medications like antihistamines reduce sneezing and itching by blocking histamine receptors. GLP-1 medications work by mimicking hormones that suppress appetite and slow digestion. Pharmacology is a field driven by curiosity about the body's intricate signaling networks. **How can a single molecule trigger a whole cascade of effects, altering physiology in ways that either heal or harm?**

For students, pharmacology offers an exciting gateway into the real-world applications of science. It connects fundamental concepts like receptor binding, metabolism, and dose-response relationships to pressing global challenges such as antibiotic resistance, mental health treatment, and therapeutics for emerging diseases. Whether you're interested in research, the pharmaceutical industry, public health, or science policy, **studying pharmacology provides the tools to understand how scientific discoveries translate into therapies** that directly affect human health and wellbeing.





WHAT'S THE DIFFERENCE BETWEEN PHARMACOLOGY AND PHARMACY?

Pharmacology is the science of how drugs act on biological systems and how the body responds to the drug. The study of pharmacology includes the sources, chemical properties, biological effects and therapeutic uses of drugs. Pharmacy uses the knowledge derived from pharmacology to achieve optimal therapeutic outcomes through the appropriate preparation and dispensing of medicines.

Pharmacology integrates the knowledge of many disciplines, including medicine, pharmacy, nursing, dentistry, and veterinary medicine. This integrative nature allows pharmacology to have a unique perspective for solving drug, hormone, and chemical-related problems as they impact human health.

Since pharmacology can be studied at so many different levels, it has **many applications**, including:

- ▶ Focusing on **treatment and prevention of diseases**
- ▶ Examining the **effects of chemical agents** on cellular mechanisms
- ▶ Dealing with the potential **hazards of pesticides** and herbicides
- ▶ Understanding how and why **harmful drug reactions** can occur
- ▶ **Informing policies** on drug safety, regulation, and public health
- ▶ **Responding to pandemics** and other global health crises

Some of the **new and exciting areas in pharmacology** are:

- ▶ **Artificial intelligence (AI) and big data** approaches that can assess thousands of potential compounds and predict how they might behave in the body, speeding up the development of new treatments
- ▶ **Personalized precision medicine** to select the right drug and the right dose for each individual
- ▶ **Gene and cell therapies** that aim to fix or replace faulty genes or even reprogram a patient's own cells to fight diseases like cancer
- ▶ **Regenerative pharmacology** to optimize development of bioengineered and regenerating tissues
- ▶ **Computational and modeling approaches** as both design and drug discovery tools to understand cell function
- ▶ **Biologic** drugs, such as monoclonal antibodies, that offer highly targeted ways to treat conditions like autoimmune diseases
- ▶ **Nanotechnology-based** approaches to fighting disease

While remarkable progress has been made in developing new drugs and in understanding how they act,

SO MANY OPPORTUNITIES ARE UNFOLDING!

Ongoing discoveries will continue to raise **new and intriguing questions** that stimulate further research and evoke the

NEED FOR FRESH PERSPECTIVES AND INSIGHTS.

This guide provides a broad **overview of the discipline of pharmacology**, describes the many career opportunities for graduates in the pharmacological sciences, and outlines the paths you can follow for a rewarding career.

If you:

- ▶ Are motivated by the opportunity to **improve human health** and wellbeing,
- ▶ Are seeking a rewarding **career in the biomedical sciences and related fields**,
- ▶ Want to contribute to the **understanding** of both novel and current **diseases**,
- ▶ Would like to be involved in the **development or delivery of new therapies**,

Then you should: EXPLORE PHARMACOLOGY!



“

Pharmacology appealed to me because of the highly translational component. It also offered me interdisciplinary training, which really provided me with multiple theoretical and technical skill sets to make me competitive for a career in science. Think cross-fit training. By identifying novel mechanisms of action of toxicants I hope to decrease the risk that these compounds pose to humans.”



— **Brian Cummings, PhD**, Dean, Eugene Applebaum College of Pharmacy and Health Sciences, Wayne State University

What Do Pharmacologists Study?

Pharmacology is the study of **how a drug affects a biological system**. These effects can be therapeutic or toxic, depending on many factors. Pharmacologists are often interested in *therapeutics*, which focuses on the effects of drugs and other chemical agents that minimize disease, or *toxicology* which involves the study of the adverse, or toxic, effects of drugs and other chemical agents. Toxicology can refer to both drugs used in the treatment of disease and with chemicals that may be present in household, environmental, or industrial hazards.

Pharmacology has two major branches: **pharmacodynamics** and **pharmacokinetics**.

Pharmacokinetics

Absorption, Distribution, Metabolism, and Excretion of Drugs

Pharmacodynamics

Molecular, Biochemical, and Physiological Effects of Drugs, Including Drug Mechanism of Action

Pharmacodynamics is what the drug does to the body and pharmacokinetics is what the body does to the drug.

The pharmacokinetics and pharmacodynamics of a drug will change with disease states leading to decreased therapeutic effect and increased toxicity. Age, sex, liver function, and kidney function can also change drug response.

Pharmacology isn't about memorizing lists of drugs and their effects. Its interdisciplinary nature includes many areas that help us understand how to improve human health.

- ▶ **Behavioral Pharmacology** is about how drugs affect what you do, and how what you do affects drugs. Research in this area might look at how sleep, stress, or habits change the way drugs work in your body.
- ▶ **Biochemical Pharmacology** zooms in to the tiny chemical reactions happening inside your cells. It's asking: what's going wrong at the molecular level when you're sick, and how can a drug fix it? For example, can a medication correct a chemical imbalance linked to a disease?



In my role, I integrate knowledge from different disciplines including chemistry, biology, safety, and clinical pharmacology to predict/estimate effective dose and dosing regimens. The success of these predictions and benefit to patients really demands that we understand the target pharmacology. What excites me most about my career is that one of these molecules may become a successful drug and may make a difference in the quality of lives of our patients! I find that hope extremely rewarding.”

— **Aarti Sawant**, PhD, Group Director, Clinical Pharmacology, AstraZeneca

- ▶ **Cancer Pharmacology** is the study of how chemical agents and drugs interact with cancer cells to treat, manage, or prevent the disease. The goal is to kill harmful cells without hurting healthy ones.
- ▶ **Cardiovascular Pharmacology** focuses on your heart and blood vessels. If someone takes medication for high blood pressure or heart disease, this field explains how those drugs help control blood flow, heart rate, and circulation.
- ▶ **Clinical Pharmacology** is where everything comes together in real patients. It looks at how drugs actually work in people, not just in theory. Why does one medication work great for your friend but not for you? Why do side effects happen?
- ▶ **Drug Metabolism** is all about what your body does to a drug after you take it. For example, why does one person feel relief quickly while another needs a higher dose? It often comes down to how fast their body breaks the drug down.
- ▶ **Endocrine Pharmacology** deals with hormones, also known as the body’s chemical messengers. This includes treatments for things like diabetes (insulin) or thyroid disorders, both of which rely on adjusting hormone levels.
- ▶ **Ethnopharmacology** looks at traditional and natural remedies. Have you heard of using plants like aloe for burns or turmeric for inflammation? This field studies those remedies to see what works and why.
- ▶ **Molecular Pharmacology** dives even deeper into how drugs physically interact with cells. How exactly does a drug fit into a receptor to trigger a specific effect?
- ▶ **Neuropharmacology** focuses on the brain and nervous system. This includes medications for depression, anxiety, ADHD, or epilepsy; essentially anything that affects mood, thinking, or nerve signaling.
- ▶ **Pharmacogenomics** explains why the same drug can affect people differently based on their genes. This helps doctors choose medications that are tailored to a specific patient.
- ▶ **Toxicology** looks at what happens when drugs or chemicals cause harm. This could be overdoses, negative side effects, or exposure to toxins.
- ▶ **Translational Pharmacology** is the “bridge” from the lab to the real world. It takes discoveries from research and turns them into actual treatments you can get at a pharmacy, making sure they’re safe and effective.



Did you know that 22 ASPET members and pharmacologists have won the Nobel Prize? Learn more about them at www.aspet.org/nobel

Achievements and New Frontiers

Pharmacology is such an integral part of our lives that we often aren't even aware of it. Aspirin, antibiotics, and antiseptics are so common that we forget there was a time when they did not exist. **Distinctions between the useful actions of drugs and their toxic effects were recognized thousands of years ago.** Past civilizations contributed significantly to our present knowledge of drugs and drug preparations. As people tried plant, animal, and mineral materials for possible use as foods, they noted both the harmful and helpful effects.

Early healers passed information about what worked and what didn't through generations, first through oral traditions and then through written language. Ancient Chinese writings and Egyptian medical papyri represent the earliest documented compilations of pharmacological knowledge. They included classifications of diseases to be treated and recommended prescriptions.

Over time, this approach became more organized, especially in the 1800s when scientists began isolating





active ingredients from plants, such as morphine from opium poppies, and studying how they affected the body. As science advanced, **researchers developed safer and**

more effective medicines, leading to the modern drugs we use today. What started as simple remedies has grown into a field that carefully studies and improves how medicines contribute to healthier lives.

A major contribution of modern pharmacology has been the advancement of knowledge about cellular receptors

that interact with chemical agents and hormones. New drug development has focused on steps in this process that are sensitive to modification. Identifying the structure of receptors **allows scientists to develop highly selective drugs with fewer undesirable side effects.**

Obtaining the sequence of the human genome greatly expanded the study of pharmacogenetics and pharmacogenomics, i.e., how variation in genetic information impacts how a particular drug is absorbed, metabolized, and/or eliminated, as well as how a particular drug interacts with its cellular targets. This field offers considerable promise for **development of novel therapeutics, optimized drug trials, and medicine tailored to each person's response.**

Advances in antibacterial and anticancer chemotherapy have played a major role in **reducing infectious diseases and producing treatments** for certain types of cancers. Other research has led to the development of more effective treatments for pain, anxiety, and chronic psychiatric disorders with far fewer unpleasant side effects. Clinical and quantitative pharmacology methods were **instrumental in the development of COVID-19 therapies and vaccines.** Advances in clinical trials, scientific collaboration, and integrative approaches allowed for the fastest vaccine rollout in history to respond to the global pandemic.

There are still many diseases that we don't know how to cure or manage adequately. For example, neurodegenerative diseases like Alzheimer's and Parkinson's remain major challenges. Many types of cancer are now treatable, but some, like pancreatic or certain brain cancers, are still very difficult to cure. Chronic conditions like autoimmune diseases such as lupus or multiple sclerosis can often be managed, but not cured, and treatments don't work the same for everyone. Newly emerging diseases can lead to global health crises, especially in vulnerable communities. With training in pharmacology, there are so many ways to contribute to the treatment and management of diseases and to have a real impact on human health. It is an exciting time to **Explore Pharmacology!**



“Being at the forefront of developing new treatments for patients is what drew me to pharmacology. My lab possesses the expertise to collaborate directly with pharmaceutical and biotechnology companies from around the world to understand how specific compounds work to treat pain.”

— **Beverley Greenwood-Van Meerveld**, PhD, Professor of Physiology, University of Oklahoma and Director of Oklahoma Center for Neuroscience

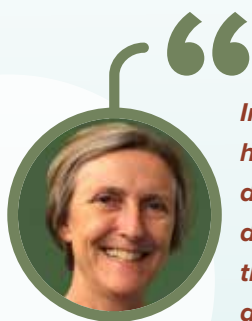
Career Opportunities

Pharmacology knowledge is necessary in just about all biomedical and veterinary related fields. There is also an increasing need for experts who can study, comprehend, and translate pharmacology in a number of related fields. The **diverse career opportunities** in pharmacology reflect the integrative nature of the field.



What are some of the career options for those with training in pharmacology?

Field	Example Job Titles/Areas
Academia	Professor, Instructor, Lecturer, Lab Manager, Administrator, Research Associate
Foundations and Non-profits	Program Manager or Director, Grants Officer, Executive Director, Communications Specialist, Project Manager
Government	Investigator, Staff Scientist, Director of Regulatory Affairs, Advisor, Administrator, Program Director
Industry	Staff Scientist, Director of Research, Project Manager, Medical Science Liaison, Field Application Specialist, Quality Assurance Manager
Law	Tech Transfer Specialist, Patent Lawyer, Compliance Officer
Science Policy and Outreach	Policy Analyst or Advisor, Public Affairs Director, Outreach Director, Government Affairs Specialist, Consultant
Science Writing and Communications	Author, Editor, Freelance Writer, Journalist, Medical Writer, Social Media Manager



Imagine knowing that your research directly contributed to finding a new treatment which helps patients! That gives me the day-to-day excitement I feel in applying pharmacology to discover drug targets that can modify or prevent disease. Understanding the principles of drug action opens the door for a universe of careers. These principles guide testing of ideas through bench research to understand effectiveness of the novel molecule. Toxicologists assess its safety and clinical pharmacologists design trials in humans. Regulatory scientists evaluate all this to enable the US Food and Drug Administration’s decision on approval. It is never, ever boring to come to work each day.”

— **Pamela Hornby**, PhD, Senior Scientific Director & Fellow, Cardiovascular & Metabolic Disease Therapeutics, Janssen, Pharmaceutical Companies of Johnson & Johnson

Pharmacologists who want to pursue **teaching and/or research careers** in academic institutions can join university faculties in all areas of the health sciences, including medicine, dentistry, veterinary medicine, pharmacy, pharmaceutical sciences, and nursing. Universities also offer research opportunities in virtually every pharmacology specialty.

Government organizations employ pharmacologists in research centers such as the National Institutes of Health, the Food and Drug Administration, and the Centers for Disease Control. Opportunities range from basic research to study the actions and effects of pharmacological agents to drug safety and regulation. Professionals in **regulatory affairs** take the data generated by pharmacologists and use it to demonstrate a drug's safety, quality, and effectiveness according to strict legal and scientific standards.

The applications of pharmacology to health and agriculture have resulted in phenomenal growth of the drug manufacturing industry. **Pharmaceutical corporations** employ pharmacologists to develop products and to determine molecular or biochemical actions of various chemicals. Pharmacology has many

opportunities for **entrepreneurship**, especially if you're interested in turning scientific ideas into real-world solutions. **Biotech or pharmaceutical startups** focus on developing new drugs, improving existing ones, or creating novel delivery systems like targeted therapies or long-acting formulations.

Private research foundations involved in addressing vital questions in health and disease also need the expertise of pharmacologists. If you're interested in technology, the growing use of **AI in drug discovery** has opened the door for companies that specialize in predicting drug behavior, screening compounds, or optimizing clinical trials.

The need to communicate science effectively with policymakers and the public has yielded opportunities in **science writing, science policy, and outreach**. The biotechnology field requires **tech transfer and patent professionals** who can help translate and advance discoveries for wider use.

Regardless of the setting, pharmacologists often work as members of multidisciplinary groups. Collaborating with professionals from many backgrounds contributes to the thrill of entering unexplored realms and participating in discoveries that have a real impact on life and health.



Preparing for a Career in Pharmacology

Suggested bachelor's degrees for pharmacology:

For those attending schools that may not offer pharmacology courses or degrees, students are advised to earn a bachelor's degree (either a B.S. or a B.A.) in one of the biological sciences, chemistry, or biochemistry.

Suggested coursework to prepare for a career in pharmacology:

- ▶ Computer Science
- ▶ Literature and Language
- ▶ Biochemistry
- ▶ Molecular Biology
- ▶ Organic Chemistry
- ▶ Physics
- ▶ Calculus
- ▶ Statistics
- ▶ Toxicology
- ▶ Pathology
- ▶ Anatomy
- ▶ Physiology

Research experience is valuable

Hands-on research experience will help you learn how to solve problems and think like a scientist. Get acquainted with professors who have active research programs and inquire about working as a laboratory assistant, either during the academic year or during the summer. There are also many formal undergraduate research programs available, including the **Summer Undergraduate Research Fellowship (SURF) program offered through the American Society for Pharmacology and Experimental Therapeutics**. Information on this program can be obtained at <https://www.aspet.org/awards/SURF/>.





“As an educator of medical students, I thrive on the “lightbulb” moments when the mechanism of how a drug works suddenly comes alive for the students.”

— **Kelly Karpa**, PhD, Associate Dean of Institutional Effectiveness and Innovation for Quillen College of Medicine, East Tennessee State University



Post-baccalaureate programs

Some students find that post-baccalaureate (“post-bac”) programs are a useful additional step to improve their skills after the bachelor’s degree. Post-bac programs may help with additional research experience or in completing coursework required to apply to graduate programs. They may be formal programs or involve more independent study. Students interested in these opportunities should seek programs that match their career goals.

Graduate study

Depending on your chosen career field, a master’s, PhD, or other professional doctoral degree (MD or PharmD) may be required. PhD programs in pharmacology can also be found in schools that offer medical, pharmacy, and veterinary medicine degrees, and in graduate schools of biomedical sciences. Many programs offer assistantships and fellowships that will provide some financial support while you are enrolled. If you would like to obtain a medical or pharmacy degree as well, look into combined MD/PhD, DO/PhD, PharmD/PhD, or DVM/PhD programs. Earning a PhD generally requires four to six years. Earning a dual degree takes about two to three years longer.

Most of a graduate program is devoted to laboratory research. The primary goal is to complete an original and creative research study that yields new information and stands up to peer review. Because each program has different areas of emphasis, it is important to consider several programs, keeping in mind how they relate to your own career goals.

What should you consider when deciding on a pharmacology PhD program?

- ▶ Areas of research expertise among faculty
- ▶ Research funding of faculty
- ▶ Publications of faculty, especially recent ones
- ▶ Mentoring approaches and support structures
- ▶ Training structure, e.g. lab rotations vs. committing to a single lab
- ▶ Availability of training grants and stipends
- ▶ Extent to which research efforts are independent or linked by interdisciplinary team approaches
- ▶ Current positions held by previous graduates

Post-doctoral research

PhD graduates have the option to complete two to four years of additional training in a post-doctoral (“post-doc”) position to expand their research skills and experience and to grow as an independent scientist. The combination of graduate and post-doctoral experiences enables investigators to contribute new perspectives on unique areas of research. It is important to note that not all careers require the completion of post-doctoral training. Typically, those who want to enter research and teaching fields will need some post-doctoral experience. If your interests are outside these areas, a post-doc may not be necessary.

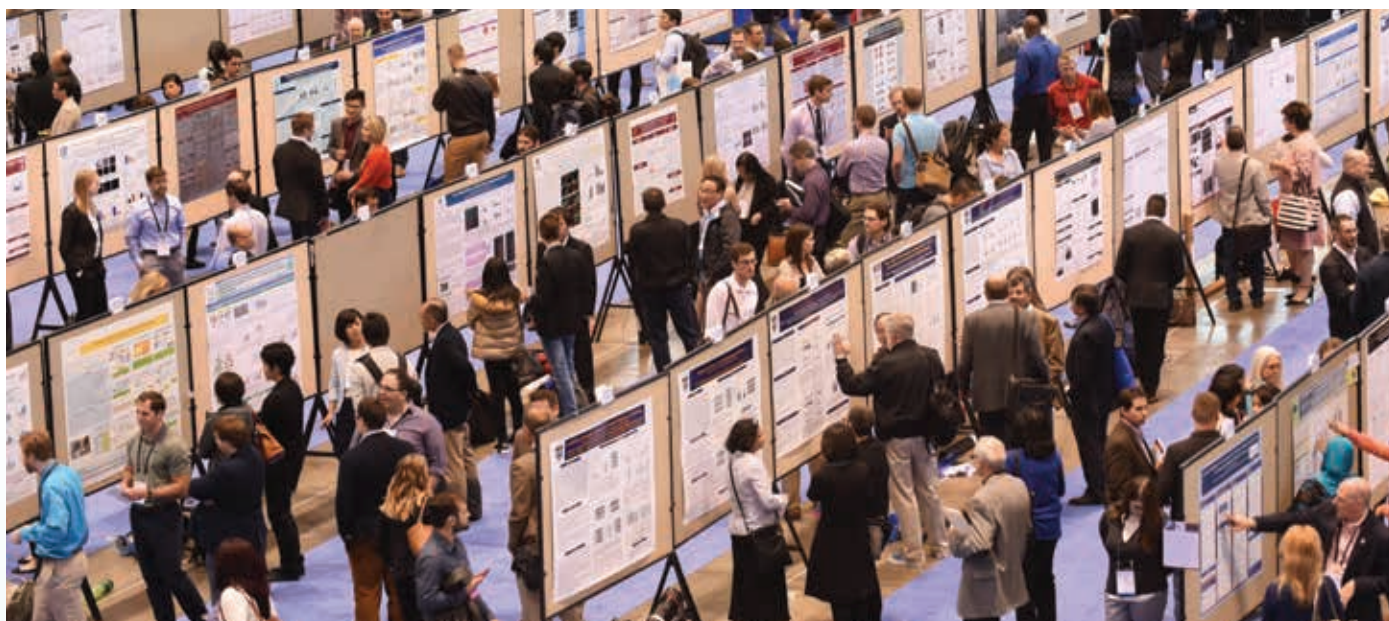
No matter what training you pursue, you should focus on gaining transferable skills, such as writing, public speaking, collaboration and teamwork, critical thinking and problem-solving, and project management.

How Professional Societies Can Help You

Navigating through the steps required for the career you want can sometimes feel overwhelming. Joining a professional society like the **American Society for Pharmacology and Experimental Therapeutics (ASPET)** can provide guidance with benefits such as:

Annual Meeting

The ASPET Annual Meeting is the premier yearly scientific conference designed to bring together researchers, students, and professionals in pharmacology and related fields. This is the place to present your research, learn from others, network with graduate program representatives and employers, and be part of the pharmacology community.



Fellowships and Awards

ASPET's Summer Undergraduate Research Fellowship (SURF) program provides stipend support for undergraduates to conduct summer research in pharmacology. See <https://www.aspet.org/awards/SURF/> for more information. Travel awards and poster awards are also available for student members to attend and present their research at the ASPET Annual Meeting. See <https://www.aspet.org/awards/> for more information.



Networking

As a member, you can learn from the expertise of more senior scientists as well as make connections with peers. Networking opportunities are available in person at our Annual Meeting, chapter meetings, and associated in-person events, as well as virtually through online member groups.



Mentoring

ASPET has multiple mentoring programs designed to meet your needs. Whether you are looking for an intensive, year-long program, focused career coaching, in-person, or virtual experiences, ASPET has options to provide guidance on the right professional path for you.

Career Center

ASPET's Career Center is constantly posting new jobs in pharmacology and related fields, including post-doctoral positions.

News and Perspectives

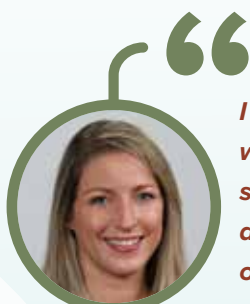
ASPET's monthly digital magazine, *The Pharmacologist*, social media presence, and website all provide news

from the field, career opportunities, and other updates relevant to members. Pharmaco Corner, ASPET's official blog, is a dedicated space where pharmacology experts can write about the issues affecting them both personally and professionally. The blog connects science and society through various pharmacology disciplines.

Publications

Stay up to date with the latest research and publish your own findings in ASPET's journals, *ASPET Discovery*, *Drug Metabolism and Disposition*, *The Journal of Pharmacology and Experimental Therapeutics*, *Pharmacological Reviews*, and *Molecular Pharmacology*.

For more information on becoming a member of ASPET, please visit: <https://www.aspet.org/membership/> - we look forward to welcoming you!



"I fell in love with pharmacology when I realized I could use my knowledge to connect with others. Bench work provided me with a foundation and appreciation for the science, but explaining the science in such a way that others could translate how the actions of a medication at a target site could prepare them to care for themselves and/or others became my passion."

— **Raeann Carrier, PhD**, Clinical Associate Professor, University of South Carolina College of Pharmacy

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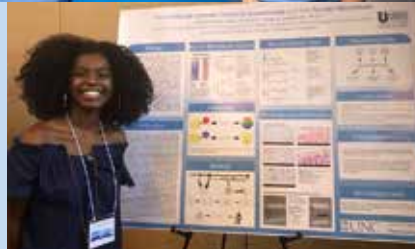
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AUGUSTA UNIVERSITY

Pharmacology PhD Graduate Program

Neuropharmacology
Vascular Pharmacology
Receptor Pharmacology

Focus Areas of G-proteins, circadian rhythms, aging, dementia, mental health disorders, motor dysfunction, etc.

Methods from behavior, to surgical manipulation, to cell and subcellular signaling, next generation sequencing, and more!

augusta.edu/mcg/phmtox

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Background image: β adrenergic receptors (blue) clustered into artificial microdomains on the surface of a living COS7 cell (red). Raymond P. Ahlquist, working in this Department at the Medical College of Georgia, Augusta, GA first defined α and β adrenergic receptors in 1948. This discovery eventually led to the development of " β blocker" drugs for hypertension and heart disease.

Master of Science in Drug Discovery and Development



The University of Texas Health Science Center at San Antonio Departments of Pharmacology and Biochemistry & Structural Biology

A two-year program (32 SCH) to train the next generation of biotech workforce. The program design incorporates comprehensive education and training in the processes of designing, characterization, testing, and bringing to market pharmaco-therapeutic drugs to treat the most vexing diseases we face today, including cancer, neurodegenerative diseases, cardiovascular disease, diabetes, osteoporosis, and infectious disease. In addition to a rigorous set of courses (both required and elective components), there is a research-based thesis.

Additional enrichment components expose students to the variety of job opportunities in the broad field of drug discovery, from the earliest phases of discovery at the bench, to the stages of development of a successful drug, and the regulatory and legal aspects of drug development. In this way, early training for the diverse range of jobs within medical therapeutics is maximized.

Priority application deadline is April 1, final deadline is May 31.

For more information contact:

Drs. Bill Clarke (ClarkeW@uthscsa.edu) or Bruce Nicholson (NicholsonB@uthscsa.edu).

Visit our web site at <https://uthscsa.edu/biomedical-sciences/programs/drug-discovery-development-ms>





<https://www.bumc.bu.edu/ppb/education/pharmacology>

PhD Program in Pharmacology

Based in the department of Pharmacology, Physiology & Biophysics, our training program spans across Medical and Charles River campuses and includes faculty from other departments including Biomedical Engineering, Chemistry, and Biology

Research Areas

- Cancer Pharmacology
- Medicinal Chemistry
- Developmental Biology
- Cardiovascular Disorders
- Substance Use Disorders
- Pain and Spinal Cord Injury
- Infectious Diseases
- Neurodegenerative and Neuropsychiatric Disorders

- ❖ Genomics and Multiomics
- ❖ Spatial Transcriptomics
- ❖ Structural Biology
- ❖ Machine Learning

Our program is committed to cultivating a diverse and respectful environment for all.

We provide a rigorous fundamental curriculum and selection of advanced electives, fostering integrative research to bridge basic, applied, and clinical science

Industry Affiliation

Our academic experiences are further enriched by long-standing partnerships and summer rotations with internationally recognized pharmaceutical and biotechnology corporations

Career and networking opportunities

State of the art core facilities

T32 NIGMS Grant in
Biomolecular Pharmacology



WHERE DO YOU SEE YOURSELF IN ONE YEAR?



THE 1-YEAR MS DEGREE

In Pharmacology & Toxicology

The PHTX MS program at the University of Utah offers a uniquely rigorous and well-resourced training environment that rivals many longer graduate programs. This one-year, 30-credit structure balances efficiency with depth, enabling driven students to complete advanced training in a shorter timeframe without sacrificing quality. The existence of dual tracks (Thesis vs. Capstone) allows tailored pathways: a thesis track for those seeking research-intensity, and a capstone track for those emphasizing professional or translational roles.

Alongside PhD students and research faculty, students will gain professional research experience and skills. This program is designed to prepare students for industry positions or in preparation for PhD studies.

- Take coursework with research scientists
- Work in laboratories
- Participate in professional development activities



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Department of
Pharmacology & Toxicology

