

PHARMACOLOGY AND TOXICOLOGY, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Description

The fields of pharmacology and toxicology are by nature interdisciplinary biomedical sciences, drawing upon the foundations and approaches of cell biology, systems physiology, biochemistry, molecular biology, and genetics. A primary objective of pharmacology is to investigate fundamental aspects of cellular and molecular regulatory mechanisms for the purpose of understanding how drugs act and in order to develop new drugs for treatment of disease. Toxicology examines how chemical agents produce adverse effects on the organism, and studies mechanisms by which these materials contribute to cancer, neurological diseases, metabolic disorders and many other diseases and conditions. Our program is truly unique. One of the only eight majors in toxicology and pharmacology in the United States, it is the only one that blends molecular/cellular and environmental studies of toxicology and pharmacology.

What is Pharmacology & Toxicology?

Pharmacology and toxicology study two sides of the same coin namely how do chemicals affect organisms positively (Pharmacology) or negatively (Toxicology). Toxicology as the study of the adverse effects of chemical, physical, or biological agents on people, animals, and the environment. It complements the study of Pharmacology, which examines the beneficial effects of chemical and biological agents. Pharmacologists and Toxicologists are scientists trained to investigate, interpret, and communicate the nature of beneficial as well as hazardous effects of manmade chemicals. These are interdisciplinary sciences, integrating information from biology and virtually all its subspecialties (e.g., genetics, endocrinology and molecular biology) as well as math, physics, and chemistry and its subspecialties (e.g., analytical, organic, and clinical chemistry).

You Might Like this Program If...

- You want to translate detailed knowledge of biology and biochemistry into a form that benefits human and ecological health as well as policy decisions
- You want to study how new drugs are discovered and evaluated for health benefit as well as potential toxic responses
- You appreciate that human-made chemicals released into the environment impact the ecosystem and want to understand how you define and manage safety