

PHARMACOLOGY

PREPARATION FOR THE MAJOR

High School Preparation

Recommended as part of or in addition to UC's "a-g" admission requirements:

**One year of biology,
One year of chemistry,
Mathematics through
trigonometry,
One year of physics.**

Transfer Preparation

**The following courses are
required prior to transfer,
with a minimum GPA of 2.7
or higher:**

**One year sequence of general
chemistry with laboratory,
and one sequence (2-3 terms)
of general biology.**

**To make normal progress in
the major, it is also strongly
recommended that students
complete all of the following
courses prior to transfer:**

**Two terms of calculus and one
term of statistics:**

**Two terms of organic chemistry
with laboratory,**

**One-year sequence of physics
with laboratory.**

Please see the UCSB *General Catalog*
(www.catalog.ucsb.edu) or
your school counselor for more
information on course preparation.
California community college
students should see www.assist.org.

Pharmacology is a subject that integrates a knowledge of biochemistry, cell and molecular biology, physiology, and chemistry to study the relationship between biological processes and therapeutic agents. Pharmacologists investigate the active effects and mechanisms of drugs and chemical agents within living organisms. The areas of pharmacology are many and diverse, and include the therapeutic and toxicological actions of drugs on humans, animals and microorganisms; the influence of chemicals upon the environment and biological ecosystems and; the use of drugs as research tools for the elucidation of molecular and biochemical mechanisms.

In 1974, UCSB became the first campus in the nation to offer an undergraduate pharmacological sciences curriculum. In contrast to professional programs in medicine, nursing, and pharmacy, which emphasize the therapeutic principles and applications of pharmacology, UCSB emphasizes pharmacology as a basic science. UCSB's Pharmacology major is designed for students with research interests in all areas of the health sciences.

The Department

The Department of Molecular, Cellular, and Developmental Biology, of which the Pharmacology major is a part, is one of the largest on campus. In addition to the Bachelor of Science (BS) degree in Pharmacology, the department offers a major in Biological Sciences, Biochemistry-Molecular Biology, Cell and Developmental Biology, and Microbiology. The diverse 21-member faculty offers approximately 50 upper-division (junior and senior) courses. These courses include laboratory studies, lectures and seminars, and independent studies and group projects.

Nine department faculty members teach the core upper-division Pharmacology courses. Numerous other faculty members teach and conduct research in areas related to pharmacology such as cell biology, neurophysiology, endocrinology, biochemistry, immunology, biotechnology, genetics, and ecology. Elective course offerings are further enhanced by interdisciplinary studies with faculty in the departments of Chemistry; Ecology, Evolution, and Marine Biology; and Psychology. Many students join faculty in research related directly or indirectly to pharmacology.

The Major

Students planning to major in pharmacology enter UCSB as pre-biological sciences majors and take a common core curriculum of introductory biology, general chemistry, mathematics, physics, and organic chemistry. Students should complete this preparatory coursework in their freshman and sophomore years. Following successful completion of a subset of these courses, students may advance from pre-biology to full major status. The pharmacology major requires completion of upper-division coursework in biochemistry, pharmacology, molecular biology, and genetics. Students round out their degree by selecting electives in molecular and cellular biology, neurobiology, biochemical pharmacology, physiology, and developmental biology.

Supplemental Programs

The “Colloquia on Pharmacological Sciences” and the Pharmacology Industrial Affiliates Program (industrial internships) are two supplemental programs associated with UCSB’s Pharmacology program. These programs enhance students’ preparation in pharmacology from an academic and industrial point of view.

The Colloquia is a series of seminars delivered by distinguished visiting pharmacologists from academia and the pharmaceutical industry and is designed to familiarize students with current “state of the art” pharmacology. The industrial internships serve as powerful stimuli to students preparing for graduation and allow students to test their classroom acquired skills in the work environment. In some cases, these internships have motivated students to pursue advanced degrees in pharmacology or to pursue medical school and other areas of the health sciences. In other cases, the internships have become full time positions. Currently, participating companies include Amgen, Allergan and Syntex in California; Merck Sharp and Dohme, Sandoz, Anaquest and Wyeth-Ayerst in New Jersey; The Upjohn Company in Michigan; Bristol-Myers Squibb Research in New York; OsteoArthritis Sciences in Massachusetts; SmithKline Beecham in Pennsylvania; Whitby Research in Virginia; Abbott Lab in Illinois; Boehringer Ingelheim Pharmaceuticals in Connecticut; Zeneca in England; and Sandoz in Switzerland.

Careers in Pharmacology

UCSB’s Pharmacology students have been highly successful in their chosen fields. The pharmacology major, combined with experiences gained through the colloquia and internships, prepares students for a wide range of pharmacology-related careers. These include careers in private, state, and federally funded drug research laboratories, drug and chemical regulatory agencies, pharmaceutical companies, and environmental toxicology. The demand for graduates continues both within the pharmaceutical industry and university pharmacology departments nationwide. Recent advances in pharmacology are occurring at a very rapid pace due to the latest developments in genetic engineering. This new scientific activity has greatly increased the number of research positions available to pharmacologists in the biotechnology industry.

The Pharmacology major can prepare students for graduate study and professional programs leading ultimately to careers in medicine, dentistry, veterinary medicine, and other health sciences. Students interested in the health sciences and related professions can take advantage of the University’s excellent health sciences advisory system. They can seek advice and support from the beginning of their studies up to their entrance into health sciences graduate programs and professional schools.

Students interested in teaching biological sciences and conducting research at a university should plan to complete the Ph.D. degree. Students interested in teaching at the community college should pursue graduate work at least through the master’s degree. Teaching at the junior or senior high school (secondary) level requires the California Single Subject Teaching Credential. Students considering this last option should discuss their plans with the credential advisor in UCSB’s Graduate School of Education early in their academic careers.

For more questions about UCSB’s Pharmacology major, please call or write to the department’s undergraduate advisor at:

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