UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Office of Admissions
Santa Barbara, CA 93106-2016
www.admissions.ucsb.edu

BIOCHEMISTRY-MOLECULAR BIOLOGY

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.

"New knowledge does not come in integrated packages. It comes from the search into the unknown, along certain intellectual lines."

-Julius R. Krevans, Dean
School of Medicine
UC San Francisco

A common concern for the life and composition of the cell brings biologists and chemists together in the field of biochemistry-molecular biology. The vast and complex array of chemical reactions occurring in living matter and the chemical composition of the cell are the primary concerns of the biochemist. Life processes occurring at the molecular level, including the storage and transfer of genetic information and the interactions between cells and the viruses that infect them, are the investigatory concerns of the molecular biologist.

The Department

The Department of Molecular, Cellular, and Developmental Biology, of which Biochemistry-Molecular Biology is a part, is one of the largest on campus. In addition to the Bachelor of Science (BS) degree in Biochemistry-Molecular Biology, the department offers majors in Biological Sciences, Cell and Developmental Biology, Microbiology, and Pharmacology. The diverse 21-member faculty offers approximately 50 upper-division (junior and senior) courses encompassing laboratory and field studies, lectures and seminars, and independent studies and group projects in biochemistry-molecular biology. These scientists are internationally known in their areas of specialty, conducting research in diverse areas such as virology, gene expression and regulation, cellular differentiation, signal transduction, immunology and mammalian cell genetics.

The Major

Biochemistry and molecular biology are subdisciplines within the larger, more general area of biological sciences. The study of biochemistry and molecular biology requires that students be genuinely interested and able to perform successfully in the "quantitative" sciences and that they have acquired a solid foundation in biology, chemistry, mathematics, and physics in their high school or community college careers.

Students who plan to major in Biochemistry-Molecular biology enter UCSB as Pre-Biological Sciences majors and take a common core curriculum consisting of introductory biology, general chemistry, physics, organic chemistry, a full year of calculus and an additional mathematics course, preferably differential equations. Students should complete this preparatory work in their freshman and sophomore years. After completing a subset of these courses, students may advance from pre-biology to full major status. The Biochemistry-Molecular Biology major requires completion of upper-division coursework in biochemistry, physical chemistry, general and molecular genetics, plus electives.

Throughout the Biochemistry-Molecular Biology program, students encounter and work with the sophisticated techniques and equipment that enable them to penetrate

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what one scientist refers to as "the boundaries between what we know and what we do not know, between our current understanding and what we are seeking to understand." At UCSB, students learn not only in the classroom, but also in the laboratory. They actively engage in research with faculty and routinely interact with graduate students and postdoctoral research fellows. A continuing series of seminars conducted by outside researchers, as well as seminars on advanced topics conducted by department faculty, supplement the curriculum.

Careers in Biochemistry-Molecular Biology

The Biochemistry-Molecular Biology major is excellent preparation for graduate study leading to the master's and Ph.D. degrees in most of the biological sciences. Biochemistry-Molecular Biology students gain entry into graduate programs in major universities without needing to make up deficits in either course work or understanding.

Students interested in research careers can take advantage of the department's many exciting laboratory experiences in areas such as recombinant DNA, immunology, pharmacology and medical microbiology. These laboratories, along with the biochemistry laboratory, help students prepare for a variety of laboratory related positions with major universities, government research institutions, and private firms which specialize in pharmaceuticals, biotechnology, and biomedical diagnostics.

The Biochemistry-Molecular Biology major is also excellent preparation for medical, dental, pharmacy, or veterinary schools where an understanding of biology at the molecular level is fundamental. 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 in biology up to their entrance into health sciences graduate programs and professional schools.

Students interested in teaching biological sciences or conducting research at the university should plan to complete a Ph.D. degree. Students interested in teaching at the community college level 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 the Biochemistry-Molecular Biology major, please call or write to the department's undergraduate advisor at:

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Molecular, Cellular, and Developmental Biology
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