Biochemistry and Molecular Biology

The Biochemistry and Molecular Biology Program supports students in the study of biological systems at the molecular level, offering excellent preparation for graduate study in biochemistry and molecular biology, molecular genetics, developmental biology, genomics, and systems biology.

It also provides invaluable training for students wishing to pursue careers in medicine, dentistry, and other health science professions.

The study of biological systems at the molecular level relies on concepts and methods that have been adapted from chemistry, physics, and biology; hence, a firm grounding in these disciplines is central to successful study of this field.

Entering students considering this major are urged to take General Chemistry in their first year at Mills.

Students wishing to pursue careers in research are further urged to obtain laboratory research experience; opportunities are available both on and off campus.

The Biochemistry and Molecular Biology Committee, composed of biology and chemistry faculty members, administers this program and advises majors.

Students have access to a variety of pieces of equipment used in this disciplinary area; for example: thermal cyclers for polymerase chain-reactions, a digital gel imaging system, nucleic acid hybridization ovens, an ultraviolet (UV) wavelength cross-linker, a tabletop ultracentrifuge, UV-visible spectrophotometers, both gas-liquid and high-performance liquid chromatographs, a nuclear magnetic resonance spectrometer, a fluorometer, and a 96-well plate reader. The Scheffler Bio-Imaging Center houses a Leica DMLR research-quality fluorescence microscope with a digital camera and a research-quality Nikon dissecting scope capable of photo microscopy. Standard laboratory equipment is also available, such as clinical and high-speed centrifuges and micro-centrifuges, bacterial cell shakers and incubators, electrophoresis equipment, dissecting and compound microscopes, and culturing facilities for embryos and algae.

Program Goals

- Be able to apply the fundamental principles of chemistry to the understanding of how biological systems function at the molecular level.
- Be able to relate the structures of biological molecules (DNA, RNA, proteins, carbohydrates, and lipids) to their biochemical activities and biological functions.
- Be able to apply arguments relating to the molecular unity of biological systems as it relates to molecular evolution.
- Understand the principles behind the tools and techniques used in the “in vitro” study of molecular biological systems.
- Be able to interpret the data obtained using the tools and techniques used in the “in vitro” study of molecular biological systems.
- Be able to access the primary literature of the discipline and to use its findings.

Majors

Biochemistry and Molecular Biology Major—BA

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