

Biochemistry & Molecular Biology

at Centre College

Centre's program in biochemistry and molecular biology (BMB) provides the opportunity to explore living systems at their molecular and cellular levels. The fundamentals of cell function, from gene expression to cellular metabolism, are studied, as well as timely topics such as genetic engineering, drug development, and cell signaling. Through classroom and hands-on laboratory experiences, our program prepares students for graduate training in biochemistry, cell biology, and molecular genetics; for preparatory training in the health professions (medicine, dentistry, or other health science fields); and for employment in areas such as the pharmaceutical industry and biomedical research.

The Program

When the major program in biochemistry and molecular biology began at Centre College in 1967, it was one of the few such undergraduate programs in the country. Our own program has changed and grown in many ways. Nevertheless, two things have remained constant:

1. We provide a solid, broad introduction to biochemistry and molecular biology—one with as much depth, span, and currency as can be found in any undergraduate program.
2. We develop close relations with our students. They are an exceptionally talented group, and we attempt to give them the individual attention necessary not only for getting the most out of their current studies, but also for selecting and planning their careers.

Our Curriculum

Our program begins with the basics: a series of courses in biology, chemistry, and physics. These courses, along with your general college requirements, will occupy most of your first two years.

You will get an overview of the whole field of biochemistry and molecular biology in BMB 210 during your sophomore year. In your junior and senior years, you will take a series of four BMB courses designed to develop in finer detail how the cell operates on a molecular level.

First, you will use your recently acquired organic chemistry background to study the intricacies of biological macromolecules, especially proteins and enzymes. That will lead to a study of cellular metabolism: the pathways by which cells harness energy and build the things they need. Your senior year will begin with the world of the gene—the molecular nitty-gritty of what genes are, what they do, how they are controlled, how they have evolved, and, now, how they may be engineered. Finally, the last course of your BMB major will be cell biology. Here you will incorporate the biochemistry and molecular genetics that you have mastered into a discussion of how cells function with one another. At the same time you will link this cellular



"BMB is a rigorous major that challenges students to think critically and to become stronger academically. Also, having direct access to the professors and having camaraderie with my classmates creates an environment where each student feels valued."

Bryan Fioret
Centre Class of 2008
Biochemistry and Molecular Biology Major

view of life to broader organismic concerns, such as development, nervous system function, and cancer. Running along with these four upper-level BMB courses are labs in which you get hands-on experience using modern equipment, not only demonstrating some of the concepts we talk about in class, but also developing practical skills and experience necessary to function effectively in a biochemistry or molecular biology lab.

One aspect of the senior year of which we are especially proud is our BMB 500: Senior Seminar. In it you learn to read, to understand, and to present information from research literature. We concentrate on the work of only three laboratories, and then a speaker from these labs (in many cases a former Centre BMB major!) comes to discuss her or his work and to dine with our group. At the end of the term, each student gives a formal presentation of a special literature research project that he or she has developed. We believe that developing in our students a critical familiarity with current research and the ability to digest and to present this material in a seminar setting is one of our most important tasks. Our students who have gone on to graduate and professional schools tell us that it is one of the rarest and most appreciated acquisitions from their undergraduate training.

Research Opportunities and Internships

Internships and summer research experiences at Centre and elsewhere provide an opportunity to apply academic study to real life problems. Centre students have gained valuable experience interning at various institutions, including Harvard, Vanderbilt, Johns Hopkins, Stanford, and UCLA.

Our Facilities

The BMB laboratories are housed in Young Hall, which was built in 1970, remodeled in 1991, and is scheduled for expansion to accommodate state-of-the-art scientific teaching and research. Among the instruments used by our students are an image analysis system consisting of a Zeiss fluorescence microscope equipped with a digital camera connected to a computer, a scanning electron microscope, cryostat, cell culture facilities (laminar flow hood, tissue culture incubator, inverted phase-contrast microscopes), computerized spectrophotometer, numerous electrophoresis apparatuses, equipment for recombinant DNA work, ultrasonicator, a liquid scintillation counter, ultrafreezer, lyophilizer, cold room, superspeed and ultracentrifuges, high-performance liquid chromatograph and fraction collectors, as well as numerous balances, pH meters, and other routine equipment.

Our Faculty

STEPHEN ASMUS, Associate Professor of Biology, Biochemistry and Molecular Biology; Dowling Professor of Science, (B.S., Cleveland State University; Ph.D., University of Michigan). Dr. Asmus is a developmental cell biologist who specializes in studying the regulation of neurotransmitters in developing neurons. He employs a variety of microscopy and cell biology techniques that are readily accessible to students interested in working on research projects in developmental neurobiology.

STEPHANIE E. DEW, Associate Professor of Biology, Biochemistry and Molecular Biology, (B.A., Centre College; Ph.D., Vanderbilt University). Dr. Dew is a nutritional biochemist interested in how the body processes small molecules. Her research on the protein molecules that carry and process retinoid compounds involves students.

JANUARY HAILE, Visiting Instructor of Chemistry, Biochemistry and Molecular Biology, (B.S., Emory & Henry; Ph.D. candidate, Virginia Tech). Haile was a research mentor at Emory & Henry College where she was president of Beta Beta Beta Biological Honors Society in her senior year.

MARGARET RICHEY, Professor of Biology, Biochemistry and Molecular Biology, (B.A., M.S., Ph.D., University of Kentucky). Dr. Richey is a molecular geneticist with interests in understanding the interactions between pathogenic fungi and their plant hosts. She has worked with students studying the traits needed by the fungus to infect the host and the biochemical defenses mounted by the host plant.



For further information about biochemistry and molecular biology at Centre, write, call or e-mail

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