

BIOCHEMISTRY & MOLECULAR BIOLOGY

ACADEMIC PROGRAM INFORMATION



"If you are interested in science and the mechanisms that make life possible, then you should consider BMB. Centre offers a uniquely close-knit, organized, and integrative BMB program. The highly experienced professors will not only challenge you, but also show genuine interest in your development as a student and future member of the professional scientific and/or health communities."

EMILY MCGLONE

Centre Class of 2018

Biochemistry and Molecular Biology Major

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, MICRO-RNAS, 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

Our program provides in-depth, training in molecular biology, cell biology, and biochemistry. We develop close relations with our students. They are an exceptionally talented group, and we 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 graduates consistently remark that they are well-prepared for graduate school and health-professions programs.

OUR CURRICULUM

Our program begins with a series of courses in BMB, 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 field of biochemistry and cell biology in BMB 210 during your sophomore year. In your junior and senior years, you will take a series of four BMB courses that explore in detail how the cell operates on a molecular level.

In the first of these four courses, you will use your recently acquired organic chemistry background to study the intricacies of biological macromolecules, especially proteins and enzymes. In the second course you will study 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 how they may be engineered. In cell biology 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 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 conducting experiments that not only demonstrate some of the concepts we talk about in class, but also give you practical skills and experience necessary to function effectively in a cell biology, biochemistry, or molecular biology lab.

BMB 500 Senior Seminar is the capstone course for the BMB major. In it you hone your skills in reading, understanding, and presenting information from research literature. We concentrate on the work of only three laboratories, and then a speaker from these labs (in many cases a Centre BMB alumnus!) 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 most appreciated components from their undergraduate education.

RESEARCH OPPORTUNITIES AND INTERNSHIPS

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

OUR FACILITIES

The BMB laboratories are housed in Young Hall, which was expanded in 2010 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, 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 additional routine laboratory equipment.

OUR FACULTY

STEVE ASMUS, H.W. Stodghill, Jr. and Adele H. Stodghill Professor of Biology and Biochemistry & Molecular Biology; (B.S., Cleveland State University; Ph.D., University of Michigan). Asmus is a cell biologist who specializes in studying the expression of neurotransmitters in neurons of the developing and adult brain. He employs a variety of microscopy and cell biology techniques that are readily accessible to students who are interested in doing research in cellular neurobiology.

STEPHANIE DEW, Professor of Biology and Biochemistry & Molecular Biology, (B.A., Centre College; Ph.D., Vanderbilt University). 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, Associate Professor of Chemistry and Biochemistry & Molecular Biology, (B.S., Emory & Henry; Ph.D., Virginia Tech). Haile is a biochemist who has worked with students on identifying novel antimicrobial compounds and investigating inhibition of microbial enzymes.

MARGARET RICHEY, Ewing T. Boles Professor of Biology and Biochemistry & Molecular Biology, (B.A., M.S., Ph.D., University of Kentucky). Richey is a molecular geneticist with interests in understanding the interactions between pathogenic fungi and their plant hosts. She is also collaborating with chemistry faculty on screening novel antimicrobial compounds.

VISIT CENTRE

The best way to judge Centre is to tour the campus, talk with the professors and students, attend a class, and spend the night in a residence hall. We invite you to visit and encourage you to contact the Admission Office if you have any questions.



FOR FURTHER INFORMATION ABOUT THE BMB PROGRAM AT CENTRE, CONTACT:

Margaret Richey, Program Chair
600 West Walnut Street
Danville, Kentucky 40422
859.238.5319
peggy.richey@centre.edu

TO COMMUNICATE DIRECTLY WITH A CENTRE STUDENT MAJORING IN BMB, CONTACT:

Emily McGlone
emily.mcglone@centre.edu

BIOCHEMISTRY & MOLECULAR BIOLOGY WEB PAGE
www.centre.edu/academics/majors-minors/biochemistry-molecular-biology