Biochemistry at Bowdoin is a science program that functions in a liberal arts environment and retains the fundamental goals of a liberal arts education. The mandate of the Biochemistry Committee is to create an undergraduate program that provides the concepts, specific laboratory skills, technical knowledge, and research experiences that students need in order to engage this broad field in its many aspects.

A liberal arts education provides a dynamic learning environment that encourages students to develop an appreciation and understanding of various disciplines, peoples, and cultures. In addition, this atmosphere cultivates independent and creative thought, sound reasoning, and effective problem-solving skills. The biochemistry faculty seeks to engage its students within an open, dynamic environment that values creativity and develops intellectual capacity and flexibility. The balance between technical proficiency and intellectual breadth—though difficult to achieve—is what makes liberal arts science education so valuable.

The goal of the Biochemistry Program of Bowdoin College is to achieve this balance: to provide an interdisciplinary program that combines high-quality scientific training with intellectual intensity. This program is meant to interrelate biology and chemistry and to provide interested students access to information and research in related fields such as molecular biology and biophysics.

One of the greatest benefits of majoring in biochemistry (or any science for that matter) at a small college like Bowdoin is the opportunity to do serious research that would primarily be available only to graduate students at a large university.

Biochemistry Major
The Biochemistry Program requires a year of biochemistry, organic chemistry, and physics, a biochemistry laboratory course, and courses in calculus and introductory biology.

The biochemistry major consists of Introductory Biology, Cell Biology and Biochemistry, Biochemistry I, Laboratory in Molecular Biology and Biochemistry, General Chemistry, Organic Chemistry I and II, Physical Chemistry I, Differential Calculus, Integral Calculus, Introductory Physics I and II, and elective courses from among the biology, chemistry, and physics departments.

There is no minor available in biochemistry.

Independent Study
The Biochemistry Program couples rigorous classroom and laboratory curriculum with the opportunity to do research in coordination with a faculty mentor. This level of student-faculty interaction is typical in liberal arts science programs and is a defining experience for many biochemistry majors.

These research projects encourage students to engage directly with faculty members to develop their own research ideas and skills. In addition, these projects provide students with technical knowledge, problem-solving skills, confidence, and proficiency in written and oral communication. Project results often lead to scholarly publications.

Honors Projects
Students seeking honors in biochemistry will carry out their research projects under the supervision of a faculty member from either
Biochemistry

Recent honors projects by majors in the Biochemistry Program include

• The Identification and Comparative Analysis of Orcokinin Family Neuropeptides in Decapod Crustaceans Using Matrix Assisted Laser Desorption/Ionization-Fourier Transform Mass Spectrometry

• Disulfide-Based Beta-Sheet Peptidomimetics

• Identification of Proteins that Interact with Thylakoid-Associated Kinases

• Beta-Turn Peptides as Asymmetric Catalysts

• An Assessment of Cervical Cancer Screening and the Prevalence of Abnormal Papanicolaou Tests among Immigrant Women

• The Use of Hydrogen Bonding to Control Conformations of Peptides and Peptidomimetics

• Nutrient Dynamics of Microbial Communities in Intertidal Sediments along the Kennebec Estuary, Midcoast Maine.

• Synthesis of \( \alpha \)-Turn Peptidomimetic Scaffolds

• Mapping the plg-1 Gene in Caenorhabditis elegans: The Search for DNA Rearrangements in a 76 kb Region

• Deletion of Cell Wall-Associated Kinase (WAK) Locus in Arabidopsis thaliana

• The Binding of Wall-Associated Kinase WAK2 to Pectin

• Effects of Arginine Methylation on Intranuclear Protein Interactions of RNA-Binding Proteins

• Enantioselective Conjugate Additions Using a Peptide Catalyst

• Deletion of the Arabidopsis thaliana Cell Wall-Associated Protein Kinase (WAK) Locus

• Activation of a Wall Associated Kinase (WAK) by Receptor Domain Fusion

• Nucleosome Formation in the Silencing of the Full Mutation FMR1 Gene

• Cellular Localization of Wall Associated Kinase Two and Related Proteins in rabidopsis thaliana

• Evidence that Cannabinoids Affect Nematode Behavior via TRPV Channels

• Thylakoid Associated Kinases (TAKs) Affect Light Harvesting and Female Gametophytic Development in Arabidopsis thaliana

• The Role of robo in Compensatory Neural Regeneration in the Cricket Gryllus bimaculatus

• Use of the Comet Assay to Identify Pollutant-Stressed Mussels (Mytilus edulis) in the Field

For more information, visit http://www.bowdoin.edu/biochemistry/

Revised March 2008