Biochemistry and Molecular Biology

Interdisciplinary

The intersection of chemistry and biology provides a creative focus for understanding the molecular processes of life. In the scientific literature, interdisciplinary research efforts are now commonplace, while in the classroom, biological topics are frequently addressed by chemists and the chemistry of biological processes is often treated by biologists. Kenyon s chemistry and biology departments offer an interdisciplinary program including two majors, biochemistry and molecular biology, each of which combines aspects of their curricula. The biochemistry and molecular biology majors are intended for students whose interests lie at the exciting interface of chemistry and biology.

Faculty

Department of Biology
Karen A. Hicks, Codirector, Associate Professor
Kathryn L. Edwards, Professor
M. Siobhan Fennessy, Associate Professor
Christopher M. Gillen, Associate Professor
E. Raymond Heithaus, Jordan Professor of Environmental Science
Patricia A. Heithaus, Instructor
Haruhiko Itagaki, Professor
Andrew J. Kerkhoff, Assistant Professor of Biology and Mathematics
Robert A. Mauck, Associate Professor
Wade H. Powell, Associate Professor
Joan L. Slonczewski, Professor

Department of Chemistry
Sheryl A. Hemkin, Codirector,Assistant Professor
Scott D. Cummings, Associate Professor
Simon P. Garcia, Assistant Professor
Yutan D.Y.L. Getzler, Assistant Professor
John E. Hofferberth, Assistant Professor
Mo Hunsen, Associate Professor
James S. Keller, Associate Professor
John K. Lutton, Professor
Dudley G. Thomas, Director of Chemistry Labs

The Curriculum

The biochemistry major provides a chemistry-based curriculum with a significant biology component, producing a solid background for continuing graduate work in biochemistry and chemistry. The molecular biology major combines a substantial chemistry background with detailed studies in cellular and molecular biology that will prepare students for postgraduate studies in these fields.

Biochemistry and molecular biology majors are encouraged to include undergraduate research as part of their curriculum, especially if they intend to continue in these fields after Kenyon. There are several options for collaborative research with faculty members from the departments of biology and chemistry. These include courses on research strategy (BIOL 385,386; CHEM 375,376) as well as honors and independent study. Students should refer to the departmental descriptions for details.

An oversight committee for biochemistry and molecular biology, composed of faculty members from the chemistry and biology departments, administers the program and determines requirements for the Senior Exercise and for the Honors Program. Students interested in these majors should contact the program codirectors.

Requirements for the Majors

The biochemistry major and the molecular biology major have many requirements in common. In addition, each of the majors has its own set of required courses.

Courses Required for BOTH Majors (5.75 units)

Courses must be completed by the end of junior year.
BIOL 113 From Cell to Organism (.5 unit)
BIOL 114 Genetics and Development of Organisms (.5 unit)
CHEM 121 or 122, and 124 or 125 Introductory Chemistry (1 unit)
CHEM 123 and 126 Introductory Chemistry Lab (.5 unit)
CHEM 231,232 Organic Chemistry (1 unit)
CHEM 233,234 Organic Chemistry Lab (.5 unit)
CHEM 335 Chemical Kinetics and Thermodynamics (.5 unit)
CHEM 256 Biochemistry (.5 unit)
BIOL 263 Molecular Biology and Genomics (.5 unit)
BIOL 264 Gene Manipulation (lab) (.25 unit)

Additional Courses Required for the Major in Biochemistry (1.75 units)

In addition to the requirements listed above (under courses required for both majors), students majoring in biochemistry must complete the following courses:

- CHEM 341 Instrumental Analysis (.5 unit)
- CHEM 371 Advanced Laboratory, Biochemistry (.25 unit)
- One course from: BIOL 109Y-110Y, 233, 238, 243, 255, 321, 333, 345, 358, 366 (.5 unit)
- Two advanced labs (.5 unit total) from CHEM 370, 372, 373 and 374
  .5 unit of CHEM 375 and/or 376 may replace one advanced lab of .25 unit
- The Senior Exercise, under the supervision of the Department of Chemistry

Additional Courses Required for the Major in Molecular Biology (1.75 units)

In addition to the requirements listed above (under courses required for both majors), students majoring in molecular biology must complete the following courses:

- BIOL 109Y-110Y Introduction to Experimental Biology (.5 unit)
- Two additional lecture/discussion courses in biology at level 200 or 300 (1 unit)
- One advanced laboratory from:BIOL 234, 239, 244 256, 322, 346, 359, 367, or CHEM 371 (.25 unit)
- The Senior Exercise, under the supervision of the Department of Biology

Senior Exercise

Students majoring in biochemistry perform the Senior Exercise under the supervision of the Department of Chemistry. Molecular biology majors perform the Senior Exercise with the Department of Biology. For details, please refer to each department's Senior Exercise requirements listed in this catalog.

Honors

Honors thesis projects may be conducted under the direct supervision of a faculty member in either department (biology or chemistry) for either major (molecular biology or biochemistry). Additional Senior Exercise requirements follow those of the department in which honors is conducted.