

Biochemistry and Molecular Biology

Interdisciplinary

The intersection of chemistry and biology provides a creative focus for understanding the molecular processes of life. Kenyon's biology and chemistry departments administer an interdisciplinary program offering two majors, biochemistry and molecular biology. Each major combines courses from both departments.

FACULTY

Department of Biology

Wade H. Powell, Codirector, Associate Professor

Kathryn L. Edwards, Professor

M. Siobhan Fennessy, Professor

Christopher M. Gillen, Associate Professor

E. Raymond Heithaus, Jordan Professor of Environmental Science

Patricia A. Heithaus, Instructor

Karen A. Hicks, Associate Professor

Haruhiko Itagaki, Professor

Andrew J. Kerkhoff, Assistant Professor of Biology and Mathematics

Robert A. Mauck, Associate Professor (on leave)

Joan L. Slonczewski, Professor

Department of Chemistry

Yutan D.Y.L. Getzler, Codirector, Assistant Professor

Scott D. Cummings, Associate Professor

Simon P. Garcia, Assistant Professor

Sheryl A. Hemkin, Associate Professor

John E. Hofferberth, Assistant Professor; Harvey F. Lodish Faculty Development 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. The molecular biology major combines a substantial chemistry background with detailed studies in cellular and molecular biology. Both majors prepare students for postgraduate studies in biomedical sciences.

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 research courses (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 either of the program codirectors, Wade Powell or Yutan Getzler.

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 115 Energy in Living Systems (.5 unit)
- BIOL 116 Information in Living Systems (.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 256 Biochemistry (.5 unit)
- BIOL 263 Molecular Biology and Genomics (.5 unit)
- BIOL 264 Gene Manipulation (lab) (.25 unit)
- CHEM 335 Chemical Kinetics and Thermodynamics (.5 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)
- Two advanced lab courses from: CHEM 372, 373, 374,

375, and 376 (0.5 units of CHEM 375 and/or 376 must be completed to count as an advanced lab)

- One course from: BIOL 109Y-110Y, 233, 238, 245, 255, 321, 333, 341, 358, 366 (.5 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 the 200- or 300-level (1 unit). At least one course must be taken from the “cellular and molecular biology” category (BIOL 238, 255, 266, 321, 333, 366, 375)
- One advanced laboratory from: BIOL 234, 239, 256, 267, 322, 346, 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 the course 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.

PLANNING FOR GRE

Majors planning to take the GRE in molecular biology should consider selecting BIOL 266 as an elective.

ADDITIONAL COURSES THAT MEET THE REQUIREMENTS FOR THIS CONCENTRATION:

BIOL 263: Molecular Biology and Genomics
 BIOL 264: Gene Manipulation
 BIOL 363: Molecular Biology & Genomics
 BIOL 364: Gene Manipulation
 CHEM 111: Introductory Chemistry I
 CHEM 112: Introductory Chemistry II
 CHEM 113: Introductory Chemistry Laboratory I

CHEM 114: Introductory Chemistry Laboratory II
CHEM 115: Honors Introductory Chemistry I
CHEM 116: Honors Introductory Chemistry II
CHEM 117: Honors Introductory Chemistry Laboratory I
CHEM 118: Honors Introductory Chemistry Laboratory II
CHEM 121: Introductory Chemistry
CHEM 122: Honors Introductory Chemistry
CHEM 123: Introductory Chemistry Lab
CHEM 124: Biophysical and Medicinal Chemistry
CHEM 125: Nanoscience and Materials Chemistry
CHEM 126: Introductory Chemistry Lab II
CHEM 231: Organic Chemistry I
CHEM 232: Organic Chemistry II
CHEM 233: Organic Chemistry Lab I
CHEM 234: Organic Chemistry Lab II
CHEM 256: Biochemistry
CHEM 335: Chemical Kinetics and Thermodynamics
CHEM 341: Instrumental Analysis
CHEM 371: Advanced Lab: Biochemistry