



Pitt

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School of Arts and Sciences

Molecular Biology Major

www.Biology.Pitt.edu

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Molecular biology emphasizes the study of molecules that make up an organism and the forces operating among these molecules. Increasingly, molecular biologists can explore the genetic control of these molecules and thus define the developmental, cellular, and sub-cellular changes that occur during the dynamic processes of life. Virtually every question, whether in biochemistry, cell biology, developmental biology, or some other biological discipline, applies molecular biology, often as the prime approach, in its solution. Biochemical and molecular developments have revolutionized biological research, fueling the explosive growth in the biotechnology industry and rapid increase of molecular medicine.

The molecular biology major, with its two tracks, provides a strong background for many science careers. Both the biochemistry and the cell and developmental biology track incorporate the requirements expected for admission to medical, dental, and other health professional schools, and to graduate schools in biochemistry, cell and molecular biology, and related disciplines. Positions for molecular biologists at the BS, MS, and PhD levels are available in the biotechnology industries as well as in universities, medical schools, hospitals, government laboratories, research institutes, and public health institutions.

Requirements for the Molecular Biology major

Biological Science courses

BIOSC 0150 Foundations of Biology 1
BIOSC 005X Foundations of Biology Lab 1
BIOSC 0160 Foundations of Biology 2
BIOSC 006X Foundations of Biology Lab 2
BIOSC 0350 Genetics
BIOSC 0370 Ecology or any BIOSC lecture course over 1010
BIOSC 1810 Macromolecular Structure and Function
BIOSC 1820 Metabolic Pathways and Regulation
BIOSC 1940 Molecular Biology
BIOSC 1581 or 1831 or 1951 (W) – Biochemistry
BIOSC 1511 or 1531 or 1561 or 1831 or 1951 (W) - Cell/Dev.

Note: BIOSC 1000 does not fulfill a requirement for this major.

Chemistry courses

CHEM 0110 General Chemistry 1
CHEM 0120 General Chemistry 2
CHEM 0310 Organic Chemistry 1
CHEM 0320 Organic Chemistry 2
CHEM 0345 Organic Chemistry Lab

Mathematics courses

MATH 0220 Analytic Geometry and Calculus 1
MATH 0230 Analytic Geometry and Calculus 2

Optional

MATH 0240 Analytic Geometry and Calculus 3 *
* MATH 0240 is not required for the major, but it is required to take CHEM 1410/1420 (Physical Chemistry 1 and 2).

Physics courses; choose one of the following pairs

PHYS 0110, 0111 Introduction to Physics 1, 2 or
PHYS 0174, 0175 Basic Physics for Science & Engineering 1, 2

Note: While not required for the major, PHYS 0212 Introduction to Laboratory Physics and PHYS 0219 Basic Laboratory Physics for Science & Engineering are useful for graduate study in certain sciences and is required for admission to many medical and dental schools.

Specialization courses

Students must choose either the Biochemistry track or the Cell and Developmental Biology track, detailed as follows.

Biochemistry track

BIOSC 1470 Biophysical Chemistry *
BIOSC 1580 Biochemistry Seminar
BIOSC 1830 Biochemistry Lab
BIOSC 1950 Molecular Genetics Lab
* Students may choose the alternate sequence CHEM 1410 and CHEM 1420 Physical Chemistry 1 and 2 in lieu of BIOSC 1470.

Cell and Developmental Biology track

BIOSC 1500 Cell Biology
BIOSC 1520 Developmental Biology
BIOSC 1560 Cell and Developmental Biology Seminar

Two of the following

BIOSC 1510 Cell Biology Lab
BIOSC 1530 Developmental Biology Lab
BIOSC 1830 Biochemistry Lab
BIOSC 1950 Molecular Genetics Lab

Note: Any University Honors College (UHC) equivalents to required courses or elective courses are acceptable.

Higher Level course requirement

Students must take one higher level BIOSC elective course as part of their BIOSC electives. BIOSC 1820 and BOPSC 1940 satisfy this requirement for the major.

Lab requirement

Students must complete at least two BIOSC labs for the major and at least one of them must be taken at the Pittsburgh Campus.

Writing (W) requirement

Students must complete at least one W-course in the major.

Grade requirements

BIOSC courses: Each required BIOSC course for the major must be completed with a grade of C or better. The elective courses for the major must also be completed with a grade of C or better. A minimum GPA of 2.0 in all departmental courses taken is required for graduation. If a C- or lower is earned in an elective course for the major but is not repeated, the course will be used to calculate the departmental GPA but will not be counted toward the 32 credits required for the major.

Co-requisite courses

Students must also earn a minimum GPA of 2.0 in the co-requisite Chemistry, Mathematics, and Physics courses. A passing grade of C- or lower in a co-requisite course can be accepted, except for CHEM 0110 and CHEM 0120, if balanced by a higher grade in another co-requisite course so that the co-requisite GPA is 2.0 or higher. Students must pass CHEM 0110 and CHEM 0120 with a grade of C (not C-) or better for the major.

Satisfactory/No Credit option

One BIOSC course can be taken on an S/NC basis.

Advising

The Biological Sciences Departmental Advisors are located in A258 Langley Hall. You are encouraged to stop by to peruse handouts or meet with an advisor even before declaring a major. They love visitors! Students will officially be advised by the Biological Sciences Advising office after declaring a major offered in the department.

Advisors

Available year round

Christine Berliner	Kevin Wu
LANGY A258	LANGY A258
412-624-4819	412-624-4273

Available during the academic year

Ellen Kelsey	Jessica Wandelt	Dan Wetzel
LANGY A258	LANGY A258	LANGY A258
412-624-0421	412-624-7192	412-648-4286

Advising e-mail: BioAdv@Pitt.edu

Declaring the major

Before students can declare the molecular biology major, they must complete BIOSC 0150, BIOSC 0160, CHEM 0110, and CHEM 0120 with a grade of C (not C-) or better. Transfer students who finish these requirements prior to admission to the University of Pittsburgh are asked to complete one term of course work, including at least one BIOSC course that counts toward the major, before declaring.

Other Biological Sciences major options

Biological Sciences	Computational Biology
Ecology and Evolution	Microbiology

Information about these majors is available in the Biological Sciences Advising Office in Langley A258.

Checklist for the Molecular Biology major

Biological Science courses

_____ BIOSC 0150 or 0715 (UHC)
_____ BIOSC 005X
_____ BIOSC 0160 or 0716 (UHC)
_____ BIOSC 006X
_____ BIOSC 0350
_____ BIOSC 0370 or any BIOSC lecture course over 1010
_____ BIOSC 1810
_____ BIOSC 1820
_____ BIOSC 1940

Chemistry courses

_____ CHEM 0110 or 0710 (UHC)
_____ CHEM 0120 or 0720 (UHC)
_____ CHEM 0310 or 0730 (UHC)
_____ CHEM 0320 or 0740 (UHC)
_____ CHEM 0345

Mathematics courses

_____ MATH 0220
_____ MATH 0230 or MATH 0235
_____ MATH 0240 *

* Required only if taking CHEM 1410 and CHEM 1420

Physics courses

_____ PHYS 0110 or 0174 or 0475
_____ PHYS 0111 or 0175 or 0476

Specialization courses

Biochemistry track

_____ BIOSC 1470*
_____ BIOSC 1580
_____ BIOSC 1830
_____ BIOSC 1950
_____ BIOSC Writ

* Students may choose the alternate sequence CHEM 1410 and CHEM 1420 Physical Chemistry 1 and 2 in lieu of BIOSC 1470.

Cell and Developmental Biology track

_____ BIOSC 1500
_____ BIOSC 1520
_____ BIOSC 1560
_____ BIOSC Writ

Two of the following

_____ BIOSC 1510
_____ BIOSC 1530
_____ BIOSC 1830
_____ BIOSC 1950