

Cellular and Molecular Biology Doctorate

Department Information

- **Department Web Site:**
ndsu.edu/cellularmolecularbiology/ (<http://ndsu.edu/cellularmolecularbiology/>)
- **Application Deadline:**
Fall- February 15 (for applicants seeking a fellowship or assistantship); Spring- July 1
- **Credential Offered:**
Ph.D.
- **Test Requirement:**
GRE required for applicants who have not earned a degree in the U.S. or any international applicants who have not earned a master's degree.
- **English Proficiency Requirements:**
TOEFL 79, IELTS 6.5, Duolingo 105
- **Program Overview:**
ndsu.edu/programs/graduate/cellular-and-molecular-biology (<http://ndsu.edu/programs/graduate/cellular-and-molecular-biology/>)

Apply Now (https://ndsugrad.my.site.com/Application/TX_SiteLogin/?startURL=/Application/TargetX_Portal__PB)

Code	Title	Credits
Required Courses		
BIOC 674	Methods of Recombinant DNA Technology	3
BIOC 701	Comprehensive Biochemistry I	4
BIOC 702	Comprehensive Biochemistry II	4
BOT 820		3
Doctoral Dissertation Research		
Each student is expected to seek out professional development by attending regular seminars in their home department or in conjunction with their research interests (for example, a seminar series or COBRE science series). Students are required to present at least one scientific seminar per year throughout the program. In addition, students will supplement their knowledge of molecular biology, cell biology, and research techniques by fulfilling the remaining credits in their plan of study with a selection from the following list of electives. Other appropriate electives may be used if approved by the student's supervisory committee, as well as the program director with input from the Steering Committee:		
ANSC 758	Molecular Biological Techniques in Animal Sciences	3
ANSC 773	Energy Metabolism	3
ANSC 774	Nitrogen Metabolism	3
ANSC 813	Domestic Animal Endocrinology	3
ANSC 828	Advanced Reproductive Biology	3
ANSC 830	Growth Biology	3
ANSC 875	Vitamins and Minerals	3
BIOC 673	Methods of Biochemical Research	3
BIOC 675	Computer Applications in Biochemistry and Molecular Biology	3
BIOC 683	Cellular Signal Transduction Processes and Metabolic Regulation	3
BIOC 716	Protein and Enzyme Biochemistry	3
BIOC 719	Molecular Biology of Gene Expression and Regulation	3
BIOC 723	Structural Basis of Membrane Transport and Signaling	3
BIOL 679	Biomedical Genetics and Genomics	3
CHEM 728	Physical Methods for Chemical and Biomolecular Research	2
CHEM 729	X-Ray Structure Determination	2
CPM 771	Modern Methods of Polymer Characterization	3
ECE 713	Introduction to Lab-on-a-Chip Technology	3
MICR 775		3
MICR 781	Advanced Bacterial Physiology	3

MICR 783	Advanced Bacterial Genetics and Phage	3
PLSC 684	Plant Tissue Culture and Biotechnology	3
PLSC 721	Genomics Techniques	2
PLSC 731	Plant Molecular Genetics	3
PPTH 759	Host-Parasite Genetics	3
PPTH 760	Fungal Genetics	4
PSCI 746	Neuropharmacology	3
PSCI 747	Cardiovascular Pharmacology	3
PSCI 762	Advanced Biopharmaceutics	2
PSCI 765	Cancer Cell Biology	2
ZOO 682		3

Admission and Application Requirements

- Graduate School admission and application requirements are found on the Admission Information (<http://catalog.ndsu.edu/graduate/admission-information/>) page.
- In addition, this program requires applicants to have the following undergraduate coursework:
 - **Biology** - One year of general biology with laboratory and one course in genetics are required. Cellular biology or cellular physiology, animal or plant physiology, and microbiology are recommended.
 - **Chemistry** - One year of general chemistry with laboratory and two sequential terms of organic chemistry with laboratory are required. Biochemistry is recommended.
 - **Mathematics** - Two terms of life sciences calculus are required.
 - **Physics** - Two sequential terms of general physics with laboratories (above the concept level) are required.
 - **Recommended** - introductory courses in computer science, statistics, and technical writing.
 - With program approval, students may take up to three courses within the first year of resident study to correct deficiencies in required courses.
- Applicants should include the following in their statement of purpose:
 - Identify at least one Cellular and Molecular Biology faculty member with whom they wish to study.
 - Identify areas of interest that align with one or more CMB faculty's research. If an applicant is open to a broad range of research, it is helpful to identify that as well (for example, working with plant genetics, any aspect of infectious disease, aspects of either cancer biology or therapeutics, etc.).
 - Students are only admitted to the program if a successful match with a CMB faculty member can be made.