

Cellular and Molecular Biology

Department Information

- **Program Coordinator:**
Katie Reindl, Ph.D.
- **Department Web Site:**
www.ndsu.edu/cellularmolecularbiology/ (<http://www.ndsu.edu/cellularmolecularbiology/>)
- **Application Deadline:**
February 15 is the deadline for applicants seeking consideration of financial assistance (fellowship, assistantships) for fall semester and July 1 for spring semester.
- **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 iBT 79, IELTS 6.5, Duolingo 105

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	Advanced Cell Biology	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 advisory 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	Molecular Virology	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	Advanced Mycology	4
PSCI 746	Neuropharmacology	3
PSCI 747	Cardiovascular Pharmacology	3
PSCI 762	Advanced Biopharmaceutics	2
PSCI 765	Cancer Cell Biology	2
ZOO 682	Developmental Biology	3

Research

In addition to didactic credits, students take research credits to fulfill their dissertation studies on a topic of significant and original work. They must pass an oral and written preliminary examination which signifies their matriculation to doctoral candidacy. They also present a public presentation of their work in conjunction with a final dissertation examination on their research to attain the doctoral degree.