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

- **English Proficiency Requirements:**
  TOEFL iBT 71, IELTS 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOC 701</td>
<td>Comprehensive Biochemistry I (required)</td>
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<tr>
<td>BIOC 702</td>
<td>Comprehensive Biochemistry II (required)</td>
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<tr>
<td>BOT 820</td>
<td>Advanced Cell Biology</td>
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<td>Select one of the following:</td>
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<tr>
<td>BIOC 719</td>
<td>Molecular Biology of Gene Expression and Regulation</td>
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<tr>
<td>MICR 783</td>
<td>Advanced Bacterial Genetics and Phage</td>
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<td>PLSC 731</td>
<td>Plant Molecular Genetics</td>
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<tr>
<td>BIOC 674</td>
<td>Methods of Recombinant DNA Technology (required)</td>
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<td>PLSC 684</td>
<td>Plant Tissue Culture and Biotechnology</td>
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<tr>
<td>ANSC 899</td>
<td>Doctoral Dissertation</td>
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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:

### Molecular Biology

- ANSC 773 Energy Metabolism
- ANSC 774 Nitrogen Metabolism
- ANSC 875 Vitamins and Minerals
- BIOC 716 Protein and Enzyme Biochemistry
- BIOC 723 Structural Basis of Membrane Transport and Signaling
- BIOL 679 Biomedical Genetics and Genomics
- PSCI 746 Neuropharmacology
- PSCI 747 Cardiovascular Pharmacology
- PSCI 762 Advanced Biopharmaceutics
- PPTH 759 Host-Parasite Genetics
- PPTH 759 Host-Parasite Genetics

### Cellular Biology

- ANSC 813 Domestic Animal Endocrinology
- ANSC 828 Advanced Reproductive Biology
- ANSC 830 Growth Biology
- BIOC 683 Cellular Signal Transduction Processes and Metabolic Regulation
- MICR 775 Molecular Virology
- MICR 781 Advanced Bacterial Physiology
### 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.