CELL BIOLOGY, BACHELOR OF SCIENCE

College of Biological Sciences

The Cell Biology Major Program

The Cell Biology major provides students with a comprehensive understanding of the cell, the basic structural and functional unit of all living organisms.

The Program

To understand living organisms, the biologist must understand the cell. Hence, cell biology lies at the core of the biological sciences. Students taking this major gain a solid foundation in biological principles. The major emphasizes how cellular organization and function contribute to the development, maintenance, and reproduction of adult organisms. The major illustrates the ways in which principles derived from the physical sciences, genetics, biochemistry, molecular biology, and physiology are integrated in the study of living cells and emphasizes the experimental nature of the study of cell biology.

Career Alternatives

The major provides an excellent background for students wishing to enter postgraduate and professional programs in biological, health sciences or veterinary sciences; for students pursuing careers involving teaching or research in the biological sciences; for students interested in careers in the biotechnological or pharmaceutical industries; or for students interested in careers related to the administrative, legal, or commercial aspects of biomedical science.

Faculty Advisor

F.J. McNally (fjmcnally@ucdavis.edu), Ph.D.

Graduate Study


Advising

Biology Academic Success Center (BASC) (https://basc.biology.ucdavis.edu/) in 1023 Sciences Laboratory Building; 530-752-0410.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td><strong>Preparatory Subject Matter</strong></td>
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<tr>
<td><strong>Biological Science</strong></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td></td>
<td>15</td>
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<tr>
<td>Choose the 002 or 004 series:</td>
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<tr>
<td><strong>Depth Subject Matter</strong></td>
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<tr>
<td><strong>Biological Science</strong></td>
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<tr>
<td>BIS 101</td>
<td>Genes &amp; Gene Expression</td>
<td>4</td>
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<tr>
<td>BIS 102</td>
<td>Structure &amp; Function of Biomolecules</td>
<td>3</td>
</tr>
<tr>
<td>BIS 103</td>
<td>Bioenergetics &amp; Metabolism</td>
<td>3</td>
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<tr>
<td>BIS 104</td>
<td>Cell Biology</td>
<td>3</td>
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</table>

Students may be able to complete their Physics requirement by blending the PHY 007 & PHY 009 series. For more details about how to do so and course placement, students will need to follow up with the PHY department. Students will also need to follow up with a BASC advisor to discuss their plans.

Preparatory Subject Matter Subtotal: 59-73
### Statistics
Choose STA 100 or 130A & 130B: 4-8
- **STA 100** Applied Statistics for Biological Sciences
- or **STA 130A & 130B** Mathematical Statistics: Brief Course

### Molecular & Cellular Biology

#### MCB 121
Advanced Molecular Biology 3

#### MCB 140L
Cell Biology Laboratory 5

Choose two: 6
- **MCB 143** Cell & Molecular Biophysics
- **MCB 144** Mechanisms of Cell Division
- **MCB 145** Assembly & Function of Cell Signaling Machinery

#### MCB 150
Developmental Biology 3-4

or **MCB 163** Developmental Genetics

Choose at least 10 units: 10
- **CHE 107A** Physical Chemistry for the Life Sciences
- **CHE 107B** Physical Chemistry for the Life Sciences
- **EVE 100** Introduction to Evolution
- **MIC 101** Introductory Microbiology
- **MIC 102** Introductory Microbiology
- **MIC 103L** Introductory Microbiology Laboratory
- **MIC 170** Yeast Molecular Genetics
- **MIC 172** Host-Parasite Interactions
- **MIC 175** Cancer Biology
- **MCB 120** Molecular Biology & Biochemistry Laboratory Associated Lecture
- **MCB 120L** Molecular Biology & Biochemistry Laboratory
- **MCB 123** Behavior & Analysis of Enzyme & Receptor Systems
- **MCB 124** Macromolecular Structure & Function
- **MCB 126** Plant Biochemistry
- **MCB 138** Undergraduate Seminar in Biochemistry
- **MCB 139** Undergraduate Seminar in Biochemistry
- **MCB 143** Cell & Molecular Biophysics
- **MCB 144** Mechanisms of Cell Division
- **MCB 145** Assembly & Function of Cell Signaling Machinery
- **MCB 148** Undergraduate Seminar in Cell Biology
- **MCB 150** Developmental Biology
- **MCB 160L** Principles of Genetics Laboratory
- **MCB 162** Human Genetics & Genomics
- **MCB 163** Developmental Genetics
- **MCB 164** Advanced Eukaryotic Genetics
- **MCB 178** Undergraduate Seminar in Molecular Genetics
- **MCB 182** Principles of Genomics
- **MCB 191** Introduction to Research
- **NPB 100** Neurobiology
- **NPB 101** Systemic Physiology
- **PMI 126** Fundamentals of Immunology
- **PMI 126L** Immunology Laboratory

#### PMI 128
Biology of Animal Viruses

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PLB 111</td>
<td>Plant Physiology</td>
<td></td>
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<tr>
<td>PLB 111D</td>
<td>Problems in Plant Physiology</td>
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<tr>
<td>PLB 113</td>
<td>Molecular &amp; Cellular Biology of Plants</td>
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<tr>
<td>PLB 113D</td>
<td>Problems in Molecular &amp; Cellular Biology of Plants</td>
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#### MMI 188A
Human Immunology 3-4

or **MMI 188B** Human Immunology

No more than 4 units of research (193, 194H, 199) may be used for credit in this category.

### Total Units
106-126

1. With BASC advisor approval, these combinations also satisfy the Chemistry requirement: CHE 004A-CHE 002A (3 units with no lab)-CHE 002B-CHE 002C; CHE 004A-CHE 004B-CHE 002C.
2. With BASC advisor approval, these combinations also satisfy the Organic Chemistry requirement: CHE 118A-CHE 008B; CHE 128A-CHE 128B-CHE 008B; CHE 128A-CHE 118B-CHE 118C; CHE 128A-CHE 128B-CHE 129A-CHE 118C; CHE 118A-CHE 128B-CHE 129A-CHE 129B; CHE 118A-CHE 118B-CHE 128C-CHE 129B.
3. With BASC advisor approval, this combination also satisfies the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C; MAT 017A-MAT 021B.
4. PHY 049 will require approval from the PHY Department to enroll.