

# 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

See Biochemistry, Molecular, Cellular & Developmental Biology Graduate Group (<https://catalog.ucdavis.edu/departments-programs-degrees/biochemistry-molecular-cellular-developmental-biology/biochemistry-molecular-cellular-developmental-biology-ms/>).

### Advising

Biology Academic Success Center (BASC) in 1023 Katherine Esau Science Hall (formerly Sciences Laboratory Building); 530-752-0410, cbsundergrads@ucdavis.edu.

Code	Title	Units
<b>Preparatory Subject Matter</b>		
<i>Biological Science</i>		18
BIS 002A & BIS 002B & BIS 002C & BIS 002D	Introduction to Biology: Essentials of Life on Earth and Introduction to Biology: Principles of Ecology & Evolution and Introduction to Biology: Biodiversity & the Tree of Life and Introduction to Biology: Principles of Cell Biology & Physiology	
<i>Chemistry</i>		15
Choose the 002 or 004 series: <sup>1</sup>		

CHE 002A & CHE 002B & CHE 002C	General Chemistry and General Chemistry and General Chemistry	
<b>OR</b>		
CHE 004A & CHE 004B & CHE 004C	General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering	
Choose the 008 series or 118 series or 128 series & 129A-B: <sup>2</sup>		6-13
CHE 008A & CHE 008B	Organic Chemistry: Brief Course and Organic Chemistry: Brief Course	
<b>OR</b>		
CHE 118A & CHE 118B & CHE 118C	Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences	
<b>OR</b>		
CHE 128A & CHE 128B & CHE 128C & CHE 129A & CHE 129B	Organic Chemistry and Organic Chemistry and Organic Chemistry and Organic Chemistry Laboratory and Organic Chemistry Laboratory	
<i>Mathematics</i>		
Choose the 017 or 021 series: <sup>3</sup>		8-12
MAT 017A & MAT 017B & MAT 017C	Calculus for Biology & Medicine and Calculus for Biology & Medicine and Calculus for Biology & Medicine	
<b>OR</b>		
MAT 021A & MAT 021B & MAT 021C	Calculus and Calculus and Calculus (Recommended)	
<i>Physics</i>		
Choose the 007 or 009 series: <sup>4</sup>		12-15
PHY 007A & PHY 007B & PHY 007C	General Physics and General Physics and General Physics	
<b>OR</b>		
PHY 009A & PHY 009B & PHY 009C	Classical Physics and Classical Physics and Classical Physics	
Preparatory Subject Matter Subtotal		59-73
<b>Depth Subject Matter</b>		
<i>Biological Science</i>		
BIS 101	Genes & Gene Expression	4
BIS 102	Structure & Function of Biomolecules	3
BIS 103	Bioenergetics & Metabolism	3
BIS 104	Cell Biology	3
<i>Statistics</i>		
Choose STA 100 or 130A & 130B:		4-8
STA 100 or STA 130A & STA 130B	Applied Statistics for Biological Sciences and Mathematical Statistics: Brief Course and 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 or MCB 163	Developmental Biology Developmental Genetics	3-4
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 (Discontinued)	
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/PLB 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	
PLB 111	Plant Physiology	
PLB 111D	Problems in Plant Physiology	
PLB 113	Molecular & Cellular Biology of Plants	

PLB 113D	Problems in Molecular & Cellular Biology of Plants	
MMI 188A or MMI 188B	Human Immunology Human Immunology	3-4
No more than 4 units of research (193, 194H, 199) may be used for credit in this category.		
Depth Subject Matter Subtotal		47-53
<b>Total Units</b>		<b>106-126</b>

- <sup>1</sup> 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.
- <sup>2</sup> 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 128C-CHE 129A-CHE 129B; CHE 118A-CHE 118B-CHE 128C-CHE 129B.
- <sup>3</sup> With BASC advisor approval, these combinations also satisfy the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C; MAT 017A-MAT 021B.
- <sup>4</sup> With BASC advisor approval, these combinations also satisfy the Physics requirement: PHY 007A-PHY 009A-PHY 049\*-PHY 007C; PHY 009A-PHY 009B-PHY 049\*-PHY 007C. \*PHY 049 requires approval from the PHY Department to enroll.