

Concentration in

Cell Biology and Development

The fields of cell and developmental biology aim to discover the functions and activities of cells, and how these cells function in concert to develop functional organisms. Cells vary incredibly in form and function, from free-living bacterial spirochetes to meter-long motor neurons. Cell biology focuses on the molecules and macromolecular structures in cells and their respective functions, the biochemistry of the reactions underlying a cell's function, and the ways in which cells interact and communicate with each other. Developmental Biology asks how single unspecialized cells differentiate and become more specialized and how groups of cells in multicellular organisms undergo morphogenesis, the process of anatomical structure formation. Fundamentally, the field of Developmental Biology seeks to understand the mechanisms by which organisms go from fertilized egg to functional, reproductive adult.

Courses in this concentration will explore the elaborate architecture of eukaryotic cells, the genetic and molecular basis of cell differentiation and morphogenesis, and the molecular biology of basic cell functions and organismal development. This concentration will provide excellent preparation for students interested in pursuing an allied health career or graduate studies in cell/molecular/developmental biology, direct entry into a research or technical position, or other careers. It is also a good choice for students who simply wish to understand how life works at the cellular level.

GENERAL BIOLOGY COURSE REQUIREMENTS FOR THE BIOLOGY BS DEGREE

- 1. BIOL 2000 Molecules and Cells**
- 2. BIOL 2010 Ecology and Evolution**
- 3. BIOL 2040 Investigations in Molecular Cell Biology**
- 4. Category A: Genetics and Genomics. Choose one course from the following**
 - BIOL 3050 Genetics
 - BIOL 3060 Introduction to Genetics
 - BIOL 3150 Introduction to Genomics
- 5. Category B: Physiology and Organismal Biology. Choose one course from the following**
 - BIOL 3030 Comparative Vertebrate Physiology
 - BIOL 3210 Plant Biology
 - BIOL 4110 Ornithology
 - BIOL 4330 Human Physiology
 - BIOL 4450 Behavioral Ecology
- 6. One Advanced Experience course (see current listing on the Biology Checklist)**

ADDITIONAL COURSE REQUIREMENTS TO COMPLETE A CONCENTRATION IN CELL BIOLOGY AND DEVELOPMENT

- 1. BIOL 3040 Cell Biology**
- 2. BIOL 4050 Evolution and Development OR BIOL 3320 / 4320 Developmental Biology**
- 3. Choose THREE additional courses from the following list**

BIOL 3320 or BIOL 4320 Developmental Biology
BIOL 4050 Evolution and Development
BIOL 4120 Inflammation and Disease
BIOL 4220 Research in Molecular Cell Biology
BIOL 4290 Metabolic Regulation and Human Disease
BIOL 4350 Biological Chemistry or
CHEM 4461 Biochemistry I
BIOL 4400 Molecular Biology
BIOL 4510 Cancer Biology
BIOL 4520 Molecular Biology of Exercise
BIOL 4540 Neuroscience

BIOL 4580 Cellular Biochemistry
BIOL 4890 Investigations in Cellular Re-programming
BIOL 5010 Nobel Prize winning research
BIOL 5040 Topics in Developmental Biology
BIOL 5130 Environmental Disruptors of Development
BIOL 5180 Seminar in Cellular Dynamics
BIOL 5200 Glycobiology and Human Disease
BIOL 5220 Movement in Biology
BIOL 5250 Topics in Nutrition and Metabolism
BIOL 5390 Molecular basis of Disease
BIOL 5420 Cancer as a Metabolic Disease
BIOL 5450 Advanced Lab for Cell Imaging

See the following faculty for advice about course selection and/or post-graduate research in this concentration:

Emrah Altindis
Anthony Annunziato
David Burgess
Tom Chiles

Rebecca Dunn
Eric Folker
Marc-Jan Gubbels
Laura Hake

Vicki Losick
Tom Seyfried
Danielle Taghian
Kenneth Williams