



University of California, Santa Barbara
Program Learning Outcomes

B.S. in Cell and Developmental Biology

Students graduating with a B.S. in Cell and Developmental Biology should be able to:

Knowledge

1. Apply the processes and methods of scientific inquiry, including the search and retrieval of scientific information, the formulation of scientific hypotheses, the design and conduct of experiments, and the analysis and interpretation of data.
2. Use the fundamental tools and knowledge of mathematics and the physical sciences needed for studying and understanding biological phenomena.
3. Understand fundamental concepts concerning the properties, structures and functions of biological molecules, metabolic pathways and bioenergetics.
4. Explain the principles of inheritance from molecular mechanisms to population level consequences.
5. Describe the principles and mechanisms of evolution at the molecular, micro and macro levels, and the role of evolution as the central unifying concept in biology.
6. Recognize the scope of biological diversity and the phylogenetic relationships among major groups of organisms.
7. Discuss the interactions between organisms and their environments, and the consequences of these interactions in natural populations, communities, and ecosystems.
8. Describe in-depth the structure, function, and behavior of cells, and their assembly and interactions as the building blocks of multicellular organisms.
9. Explain the processes and genetic mechanisms underlying development, cellular differentiation, and reproduction in complex eukaryotes.
10. Explain the structures of subcellular organelles and their functions.

Research and Laboratory Skills

11. Construct hypotheses to explain cell and developmental biological phenomena and design effective experimental strategies to test the hypotheses.
12. Conduct procedures widely used by cell and developmental biologists to visualize and analyze cells and draw appropriate conclusions from the results.
13. Read, process, and communicate ideas from the scientific literature.