

Academic Track in the Biological Science Major

CELL AND MOLECULAR BIOLOGY

Cell and molecular biologists study the molecular organization and control of cell function. Faculty involved in this program have interests ranging from molecular genetics to immunology, subcellular organization of cell structure, virology, and molecular evolution. Students following this academic track are generally preparing for careers in research, medicine, the allied health fields, teaching, or graduate study in genetics, cell, or molecular biology.

CURRICULUM: Genetics (PCB 3063), a required upper division biology course, should be taken as early as possible following completion of the major prerequisite courses. Cell Structure & Function (PCB 3134) and Molecular Biology (PCB 4024) are strongly recommended for all students interested in cell and molecular biology. Students who plan to pursue graduate study in cell or molecular biology are strongly encouraged to take a Directed Individual Study (BSC 4900) or Research Methods (BSC 4933) course. The following represents a list of other recommended elective courses offered by the department that are applicable to cell and molecular biology. Students should determine which elective courses to take based on educational interests and career goals.

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| BOT 4394 | Plant Growth and Development (3) | PCB 4233 | Immunology (3) |
| BSC 4833C | Radiation Biology (3) | PCB 4233L | Immunology Laboratory (1) |
| MCB 4403 | Prokaryotic Biology (3) | PCB 4253 | Animal Development (3) |
| MCB 4403L | Prokaryotic Biology Laboratory (2) | PCB 4253L | Animal Development Lab (1) |
| PCB 4024L | Molecular Biology Laboratory (1) | PCB 4514 | Adv. Genetics & Molecular Biology (3) |
| PCB 4063L | Experimental Genetics Laboratory (3) | | |

FACULTY: Undergraduate teaching and guidance is a large part of the commitment of our regular faculty in Biological Science. Our faculty value interaction and discussion with students and encourage individual discussion and research projects. The following faculty have expertise in cell and molecular biology:

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| Hank Bass | Molecular and cellular biology of meiosis in maize; meiotic telomere behavior |
| George Bates | Plant cell and molecular biology; gene transfer |
| Donald Caspar | Structural biology; virus assembly; protein adaptability |
| P. Bryant Chase | Biomechanics of cardiac and skeletal muscle |
| Wu-Min Deng | Molecular mechanism of cell polarization |
| Lloyd Epstein | Eukaryotic molecular genetics; RNA processing; catalytic DNA |
| Debra Fadool | Olfactory signal transduction; ion channel structure and function; neuromodulation |
| James Fadool | Developmental biology; cellular and genetic analysis of visual system development |
| Piotr Fajer | Molecular mechanisms of muscle contraction and calcium signaling |
| Betty Jean Gaffney | Structural biology; enzyme structure |
| Laura Keller | Molecular genetics; signal transduction and gene regulation |
| Thomas Keller | Cell and molecular biology of the cytoskeleton |
| Timothy Moerland | Biochemistry, biophysics, and physiology of muscle; response of muscle to disease and environment |
| William Outlaw, Jr. | Plant physiology; regulation of carbon metabolism |
| Robert Reeves | Bacterial and phage genetics; tRNA structure and expression |
| Thomas Roberts | Cell biology; cell motility |
| Kenneth Roux | Molecular immunology; immunogenetics; immunochemistry |
| Kenneth Taylor | Macromolecular structure of proteins; 3-D Electron Microscopy |

FACILITIES: The research facilities available within the Department of Biological Science allow for the performance of virtually any experiment in the field of cell and molecular biology. In addition to the standard equipment available in the laboratories of individual faculty members, the department also maintains a DNA sequencing laboratory; monoclonal antibody production laboratory; microscopy laboratory with transmission and scanning electron microscopes, confocal microscope, and fluorescence microscope; analytical laboratory with HPLCs, gel scanning densitometers, ultracentrifuges, and PCR equipment; computerized molecular modeling and gene database facility; and DNA synthesis and protein sequencing facilities (available through a cooperative liaison with the Department of Chemistry).