RESEARCH OPPORTUNITIES

Students in the Cellular and Molecular Biology Program are encouraged to perform independent undergraduate research.

Faculty Research Interests:
Mike Abler | Molecular techniques and classical genetics to explore the roles of RNA-degrading enzymes in plant metabolism.
Scott Cooper | Molecular techniques to study the regulation of blood clotting in hibernating ground squirrels.
Anne Galbraith | Molecular biology, genetics, and some biochemistry to understand the roles of DNA replication proteins in yeast meiosis.
Tisha King-Heiden | Use of a variety of physiological, behavioral and molecular techniques to better understand how environmental contaminants influence development and health in fish.
Jennifer Klein | Molecular biology, biochemistry, biophysical spectroscopy and computational simulations to understand muscle and cytoskeletal protein dynamics.
Sumei Liu | Microscopy and molecular techniques to study the effects of stress on the intestinal nervous system.
Jennifer Miskowski | Genetics, microscopy, and molecular techniques to investigate the cellular processes involved in development of the worm, C. elegans.
Tony Sanderfoot | Molecular and bioinformatics tools to study the secretory pathway in green plants.
Brad Seebach | Electrophysiology, pharmacology and molecular approaches to study circuits in the developing, mammalian spinal cord that support walking.
Jaclyn Wisinski | Use biochemistry and microscopy techniques to understand G-proteins regulation of platelet aggregation and hormone secretion.
Amy Yu | Genetics and molecular biology to understand tissue specific regulation of circadian rhythms in the fruit fly, Drosophila melanogaster.
BIOLOGY MAJOR
CELLULAR & MOLECULAR BIOLOGY CONCENTRATION

WHAT DOES THE CELLULAR AND MOLECULAR BIOLOGY PROGRAM AT UW-L HAVE TO OFFER?

In their course work, students use state of the art equipment and learn current techniques employed in cell and molecular biology research labs. The curriculum provides a balance between classic fundamental concepts and the latest breakthroughs. In Genetics, students use PCR and other diagnostic tests as well as classical Mendelian experiments to understand inheritance. In Cell Biology, students use immunofluorescence microscopy and cell culture techniques to explore factors that regulate cell growth and development. Molecular Biology has a lab in which students perform the latest techniques to measure gene transcription in different tissues. New electives expose students to the latest molecular techniques used in medicine, plant biotechnology and human genetics. The combination of theory and application makes students competitive in both the job market and in acceptance to graduate programs.

CURRICULUM

BIOLOGY REQUIREMENTS:
39 CREDITS

REQUIRED:
BIO 105  General Biology (4)
BIO 203  Organismal Biology (4)
BIO 306  Genetics (4)
BIO 307  Ecology (3)
BIO 315  Cell Biology (4)
BIO 435  Molecular Biology (3)
BIO 436  Molecular Biology Lab (1) OR
BIO 468  Human Molec Genetics Lab (1)
BIO 440  Bioinformatics (2)
BIO 491  Capstone in Biology (1)

ELECTIVES:
At least 13 credits from the following:
BIO 202  Intro Bio Data Analysis Interp
BIO 312  Human Anat & Phys I
BIO 313  Human Anat & Phys II
BIO 337  Plant Phys
BIO 406  Parasitology
BIO 408  Developmental Biology
BIO 410  Human Cadaver Dissection
BIO 412  Mycology
BIO 424  Endocrinology
BIO 428  Adv Nut Hlth Prof
BIO 429  Evolution
BIO 432  Biology of Cancer
BIO 433  Radiation Biology
BIO 436  Molecular Biology Lab
BIO 443  Molec Mech Disease & Drug Imaging
BIO 449  Microscopy & Biological Imaging
BIO 450  Internship in Biology*
BIO 463  Aquatic Animal Health
BIO 466  Human Molecular Genetics
BIO 468  Human Molecular Lab
BIO 479  Biology Laboratory Asst*
BIO 489  Independent Study*
BIO 495  Service Learn Biol*
BIO 499  Undergraduate Research*
MIC 230  Fundamentals of Micro
MIC 406  Immunology
MIC 420  Intro Virology
MIC 421  Virology Lab
MIC 427  Indus/Ferment Micro
MIC 303-305  Organic Chemistry
CHM 315  Survey of Organic OR
CHM 301  Quantitative Analysis
CHM 300  Survey of Organic OR
CHM 325  Survey of Biochem. OR
CHM 417, 418  Biochemistry

SURE PROGRAMS

Many major universities around the country offer Summer Undergraduate Research Experience (SURE) Programs for students from universities like UW-L. So in addition to research opportunities at UW-L, these SURE programs give students exposure to research in other dynamic settings.

WHAT IS CELLULAR AND MOLECULAR BIOLOGY?

Cellular and Molecular Biology are fields of biology that focus on understanding living processes at a molecular level. Many of the most exciting biological discoveries in the past 20 years have occurred in these fields. These discoveries have identified some of the genes responsible for cancer, the events regulating how a cell divides and how organisms develop from a single cell. These discoveries have helped to drive the current boom in biotechnology.

CAREER OPPORTUNITIES

Over 90% of CMB students obtain jobs in research or go on to graduate school.

Industry
Students graduating from this program will be well-trained for entry-level positions in many areas of industry. Biotechnology is used increasingly in the development and production of new drugs, agricultural products and diagnostic tests.

Graduate School
This program prepares students for graduate school in many disciplines of biology including biochemistry, cell biology, genetics, plant biology, molecular biology and immunology.

Medical School and Health Care
Medicine is becoming increasingly molecular in nature. As we discover the genetic causes of many diseases, new treatments and tests are developed. Future doctors and healthcare professionals will need to have a strong grasp of molecular biology to make diagnoses and prescribe treatments.

Environmental Applications
Many of the current testing methods used in environmental research use molecular techniques. These include research involving population studies, toxicology, endangered species and evolution.

Internships
During the school year there are several internships available at local biotechnology companies. In addition, students are encouraged to perform internships outside of La Crosse during the summer.

CHEMISTRY REQUIREMENTS:

CHM 103  General Chemistry I
CHM 104  General Chemistry II
CHM 301  Quantitative Analysis
CHM 300  Survey of Organic OR
CHM 303-305  Organic Chemistry
CHM 325  Survey of Biochem. OR
CHM 417, 418  Biochemistry

MATH REQUIREMENTS:

MTH 145  Elem. Statistics
MTH 175  Applied Calculus OR
MTH 207  Calculus I

*M A T H  R E Q U I R E M E N T S :*  2 credits of these courses can count toward the major.