# MASTER OF SCIENCE IN CELL AND MOLECULAR BIOLOGY

The graduate program in Cell and Molecular Biology is an interdisciplinary, degree-granting program that comprises over 100 faculty members from 17 departments and 6 colleges who share common interests in cell and molecular biology. The M.S. program core includes coursework in molecular genetics, cell biology, and rigorous and ethical conduct of research. Students may also select additional courses in areas related to their interests. Two alternating graduate seminar series allow students to present their research and attend presentations by CSU faculty and nationally prominent scientists.

Core courses can typically be completed during the first year. The Plan A M.S. degree can be completed within two years. The Plan B M.S. degree can be completed within 3 semesters.

Most MS students are admitted with the support of a faculty advisor to oversee the research portion of their training. Current focus areas of research include but are not limited to, Cancer Biology; Gene Expression; Genome Structure, Evolution & Repair; Infectious Disease; Metabolism & Physiology; Microbiomes; Plant Molecular Biology, Prions & Neurobiology; Stem Cells & Development; Synthetic Biology and STEM Communication. Students are encouraged to complete coursework in computational/quantitative approaches, and an emphasis is placed on effective communication with various audiences. The CMB program supports a student association and aims to create an inclusive and welcoming culture for all.

Students interested in this program should refer to the Graduate and Professional Bulletin (http://catalog.colostate.edu/general-catalog/graduate-bulletin/) or the Cell and Molecular Biology website (http://www.cmb.colostate.edu/) for further details.

## Program Learning Objectives

Graduates from our program will have strong foundations in core cell and molecular biology principles, state-of-the-art training in technical laboratory and computational skills, and leadership and communication skills necessary for professional achievement. After completing the M.S. Plan A or Plan B program, students will#be able to:

- Demonstrate and apply detailed knowledge of the molecular processes by which genetic material is replicated, expressed, and regulated and/or the cellular processes involved in membrane formation, organelle biogenesis, cell communication/shape/motility and how these are linked with growth, aging, and death.
- Evaluate primary research papers in the field of cell and molecular biology, including discerning the major questions/hypotheses being addressed, critically interpreting the data presented, assessing whether the conclusions are adequately supported by evidence, and relating the findings to the broader context and significance in the field.
- Apply appropriate, ethical, and technically competent research practices to generate and analyze data and determine biological relevance.
- Write publication-quality scientific manuscripts in the field of cell and molecular biology based on research findings (Plan A version), proposal, or literature review (Plan B version).

## Institutional Learning Objectives

The curriculum for the program is aligned with CSU's institutional learning objectives (creativity, reasoning, communication, responsibility, and collaboration) in the following ways:

- First, through a combination of coursework and research experience, students will be trained to develop novel hypotheses that address fundamental questions in the field of cell and molecular biology and/or design creative approaches to test those hypotheses.
- Second, students will develop critical thinking and reasoning skills to interpret findings from the scientific literature and their own research data.
- Third, students will gain experience in multiple modes of science communication, including writing (research papers and literature reviews), oral presentations (talks at program seminars and research conferences), and visualization (figures in papers, talk slides, and poster presentations).
- Fourth, students will become responsible members of the scientific community through mentorship, workshops, and courses on ethical, rigorous, and reproducible conduct of research.
- Fifth, students will complete their studies within a collaborative and interdisciplinary environment with a curriculum designed to support cohorts of students distributed across colleges, departments and campuses at CSU.