

CELL AND MOLECULAR BIOLOGY: CANCER BIOLOGY, PHD

Cell and Molecular Biology

The Cell and Molecular Biology Graduate Group (CAMB) is an interdisciplinary graduate program, providing rigorous training in modern cell and molecular biology, preparing students for leadership careers in biomedical research. Within this integrated program are six discipline areas: Cancer Biology (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-cancer-biology-phd/>); Cell Biology, Physiology, and Metabolism (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-cell-biology-physiology-metabolism-phd/>); Developmental, Stem Cell and Regenerative Biology (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-developmental-stem-cell-regenerative-biology-phd/>); Gene Therapy and Vaccines (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-gene-therapy-vaccines-phd/>); Genetics and Epigenetics (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-genetics-epigenetics-phd/>); and Microbiology, Virology and Parasitology (<https://upenn-curr.courseleaf.com/graduate/programs/cell-molecular-biology-microbiology-virology-parasitology-phd/>). Program faculty include more than 300 scientists representing 35 departments from the Perelman School of Medicine, the Schools of Arts and Sciences, Dental Medicine, and Veterinary Medicine, Children's Hospital of Philadelphia, the Wistar Institute and Fox Chase Cancer Center. The research efforts of these scientists are diverse in their focus, experimental system, methodology, and represent the leading edge of basic and translational biomedical science.

Students from colleges and universities around the nation and the world are enrolled in the program, selecting one discipline area based on their scientific interests, yet have access to the full breadth of curricular and research opportunities provided by this large and diverse program. Our students participate in core courses in cell and molecular biology, specialized coursework in one or more discipline areas, and original hypothesis-driven thesis research. Upon completion of the PhD, they pursue successful research careers at top academic institutions, in the biotech and pharmaceutical industries, and in other biomedicine-related career paths.

For more information: <http://www.med.upenn.edu/camb/>

Cancer Biology

The Program in Cancer Biology provides students focused training in a number of areas of cancer biology ranging from basic mechanisms to translational applications. Program faculty conduct research in DNA repair, epigenetics, metabolic pathways, the tumor microenvironment, cancer cell autonomous processes, cancer genetics and cancer immunology. Students take core molecular and cell biology courses, biostatistics course and elective courses in cancer biology and undertake three laboratory rotations of their choosing. Students have the opportunity to take grant writing courses, present in research-in-progress seminars, engage in networking opportunities, mentor undergraduates and high school students in Philadelphia as well as participate in outreach opportunities.

For more information: <https://www.med.upenn.edu/camb/cb.html>

View the University's Academic Rules for PhD Programs (<http://catalog.upenn.edu/pennbook/academic-rules-phd/>).

Required Courses

Code	Title	Course Units
Coursework		
BIOM 5550	Regulation of the Genome	
BIOM 6000	Cell Biology	
CAMB 5120	Cancer Biology and Genetics	
BIOM 6100	Foundations in Statistics	
CAMB 6050	CAMB First Year Seminar	
Select two Cancer Biology program courses		
Select two electives		
Research		
CAMB 6990	Lab Rotation	
CAMB 8990	Pre-Dissertation Lab Rot	
CAMB 9950	Dissertation	

1

Or other statistics course with approval of the Graduate Group.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2023 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Sample Plan of Study

Code	Title	Course Units
Year 1		
<i>Fall</i>		
BIOM 6000	Cell Biology	
CAMB 5120	Cancer Biology and Genetics	
CAMB 6050	CAMB First Year Seminar	
CAMB 6990	Lab Rotation	
<i>Spring</i>		
BIOM 5550	Regulation of the Genome	
CAMB 5120	Cancer Biology and Genetics	
BIOM 6100	Foundations in Statistics	
CAMB 6990	Lab Rotation	
CAMB 6990	Lab Rotation	
<i>Summer</i>		
CAMB 8990	Pre-Dissertation Lab Rot	
Year 2		
<i>Fall</i>		
CAMB 8990	Pre-Dissertation Lab Rot	
CAMB 5300	The Cell Cycle, Genome Integrity and Cancer	
	or CAMB 70: Stress Responses in Metabolism and Cancer	
Elective		
<i>Spring</i>		
CAMB 8990	Pre-Dissertation Lab Rot	

CAMB 6320 Cell Control by Signal Transduction
Pathways
or CAMB 701 Tumor Microenvironment

Elective

Year 3 and Beyond

CAMB 9950 Dissertation