

CELL AND MOLECULAR BIOLOGY, PHD: GENETICS AND EPIGENETICS

Cell and Molecular Biology

The Cell and Molecular Biology Graduate Group (CAMB) (<https://www.med.upenn.edu/camb/>) is an interdisciplinary graduate program, providing rigorous training in modern cell and molecular biology. Within this integrated program are six discipline areas: Cancer Biology (CB) (<https://www.med.upenn.edu/camb/cb.html>); Cell Biology, Physiology, and Metabolism (CPM) (<https://www.med.upenn.edu/camb/cpm.html>); Developmental, Stem Cell, and Regenerative Biology (DSRB) (<https://www.med.upenn.edu/camb/dsrb.html>); Genetics and Epigenetics (G&E) (<https://www.med.upenn.edu/camb/ge.html>); Gene Therapy and Vaccines (GTV) (<https://www.med.upenn.edu/camb/gtv.html>); and Microbiology, Virology, and Parasitology (MVP) (<https://www.med.upenn.edu/camb/mvp.html>). Program faculty include 476 scientists from the Perelman School of Medicine, the Schools of Arts and Sciences, Engineering, Dental Medicine, Veterinary Medicine, the Children's Hospital of Philadelphia, and the Wistar Institute. The research efforts of these extraordinary scientists are diverse in their focus, experimental system, methodology, and represent the leading edge of basic and translational biomedical science.

Currently, 440 graduate students from colleges and universities around the nation and the world are enrolled in the program. Students select one discipline area based on their scientific interests yet have access to the full breadth of curricular and research opportunities provided by our 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.

Our mission is to provide an exceptional mentored training experience to every student, providing a foundation for successful careers as leaders in biomedical research. We welcome prospective students who are dedicated to the search for new knowledge.

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

Genetics and Epigenetics

The Program in Genetics and Epigenetics (G&E) provides a focused and interdisciplinary education in key areas of modern biology. The curriculum covers model organism and human genetics, transcriptional and post-transcriptional gene regulation, RNA biology, and epigenetic mechanisms involved in development, neural function, cancer, metabolism, and chromatin architecture. Genomics and bioinformatics are fully integrated, ensuring a strong foundation in data-driven approaches. Faculty from the University of Pennsylvania, the Children's Hospital of Philadelphia, and the Wistar Institute offer mentorship within a vibrant and collaborative research environment. The program also emphasizes training in computational and systems biology, equipping participants with essential tools to explore complex questions in genetics, epigenetics, and genomics.

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

Required Courses

Code	Title	Course Units
Core Coursework		
BIOM 5550	Regulation of the Genome	1
BIOM 6000	Cell Biology	1
BIOM 6100	Foundations in Statistics ¹	1
CAMB 6050	CAMB First Year Seminar ²	1
	or CAMB 5420 Topics in Molecular Medicine	
Genetics and Epigenetics Concentration		
BIOM 5350	Introduction to Bioinformatics	1
	or CAMB 7140 DIYtranscriptomics	
CAMB 5500	Genetic Principles	1
CAMB 6950	Scientific Writing	0.5
Select two CAMB electives between 4000-9999		2
Select one open elective between 5000-9999		1
Research		6.5
CAMB 6990	Lab Rotation	
CAMB 8990	Pre-Dissertation Lab Rot	
CAMB 9950	Dissertation	
Total Course Units		16

University PhD Benchmarks

In addition to Program requirements, the following milestones must be completed:

Code	Title	Course Units
Qualifying Evaluation		
Candidacy Examination		
Dissertation Defense/Oral Exam		
Dissertation Deposit		

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

¹ Or other statistics course with approval of the Graduate Group.
² CAMB 6050 must be taken by PhD only students; CAMB 5420 is only taken by Combined Degree students.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2025 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		
Fall		

BIOM 6000	Cell Biology
CAMB 6050	CAMB First Year Seminar
CAMB 6990	Lab Rotation
<i>Spring</i>	
BIOM 5550	Regulation of the Genome
CAMB 5500	Genetic Principles
CAMB 6990	Lab Rotation
CAMB 6990	Lab Rotation
<i>Summer</i>	
CAMB 8990	Pre-Dissertation Lab Rot
Year 2	
<i>Fall</i>	
BIOM 6100	Foundations in Statistics
CAMB 8990	Pre-Dissertation Lab Rot
Elective	
<i>Spring</i>	
CAMB 6950	Scientific Writing
CAMB 8990	Pre-Dissertation Lab Rot
BIOM 5350	Introduction to Bioinformatics
Elective	
Year 3 and Beyond	
CAMB 9950	Dissertation