CELL AND MOLECULAR BIOLOGY: GENETICS AND EPIGENETICS, 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/

Genetics and Epigenetics
The Program in Genetics and Epigenetics provides students an opportunity to undertake concentrated study in the areas of model organism genetics, human genetics, transcriptional and post-transcriptional gene regulation, epigenetics, genomics and bioinformatics. Program faculty include members of the Genetics Department, Epigenetics Program, and other basic science and clinical departments at Penn, The Children's Hospital of Philadelphia, and the Wistar Institute. Students also have the opportunity to undertake training in the application of computational and modeling approaches in genetics, epigenetics and genomics.

For more information: https://www.med.upenn.edu/camb/ggr.shtml

View the University’s Academic Requirements for PhD Degrees (http://catalog.upenn.edu/pennbook/academic-rules-phd/).

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Course Units</th>
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<tbody>
<tr>
<td>BIOM 555</td>
<td>Regulation of the Genome</td>
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<tr>
<td>BIOM 600</td>
<td>Cell Biology</td>
<td></td>
</tr>
<tr>
<td>BIOM 611</td>
<td>Statistics in Experimental Design and Analysis</td>
<td></td>
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<tr>
<td>CAMB 550</td>
<td>Genetic Principles</td>
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<tr>
<td>CAMB 605</td>
<td>CAMB First Year Seminar</td>
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<tr>
<td>GCB 535</td>
<td>Introduction to Bioinformatics</td>
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Select three electives

Research

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CAMB 699</td>
<td>Lab Rotation</td>
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<tr>
<td>CAMB 899</td>
<td>Pre-dissertation Research</td>
<td></td>
</tr>
<tr>
<td>CAMB 995</td>
<td>Dissertation</td>
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</table>

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 2020 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Sample Plan of Study

<table>
<thead>
<tr>
<th>Code</th>
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<th>Course Units</th>
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Year 1

Fall

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Course Units</th>
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<tbody>
<tr>
<td>BIOM 600</td>
<td>Cell Biology</td>
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<tr>
<td>CAMB 605</td>
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<td>CAMB 699</td>
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Spring

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<td>BIOM 555</td>
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<tr>
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<tr>
<td>CAMB 699</td>
<td>Lab Rotation</td>
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Summer

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<td>CAMB 899</td>
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Year 2

Fall

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<tr>
<td>CAMB 899</td>
<td>Pre-dissertation Research</td>
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<tr>
<td>Elective</td>
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Spring

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<th>Code</th>
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<th>Course Units</th>
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<tbody>
<tr>
<td>CAMB 695</td>
<td>Scientific Writing</td>
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</tr>
<tr>
<td>CAMB 899</td>
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<tr>
<td>GCB 535</td>
<td>Introduction to Bioinformatics</td>
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<tr>
<td>Elective</td>
<td>Year 3 and Beyond</td>
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<tr>
<td>CAMB 995</td>
<td>Dissertation</td>
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