DOCTOR OF PHILOSOPHY IN
THE FIELD OF GENOMICS AND
BIOINFORMATICS

The PhD in genomics and bioinformatics program is designed
to develop research scientists in areas where the principles and
methods of cell and systems biology, biochemistry and genetics are
applied to the study of human diseases.

Investigators in the program use the latest technologies in
genomics, proteomics, high-resolution imaging, bioinformatics and
pre-clinical (murine) trials. The training program includes research
opportunities in autism spectrum disorders, muscular dystrophies,
biomarkers, asthma, airway diseases, brain tumors, microRNA
processing, dysregulation of mitochondrial functions and protein
trafficking.

The program begins with interdisciplinary coursework in genes,
cells and systems in biomedical sciences, professional development
in scientific communication and science careers, and laboratory
rotations offered through GW’s Integrated Biomedical Sciences
program (https://ibs.smhs.gwu.edu/). After the first year of study,
students work with their research advisor to complete remaining
degree requirements, including the dissertation.

Program faculty are drawn largely from the GW School of Medicine
and Health Sciences, including scientists from the Children’s
Research Institute of Children’s National Health System.

Students have access to extensive research facilities and libraries
on campus and in the greater Washington, DC area. These include
the School of Medicine and Health Sciences, GW’s Gelman Library
and Himmelfarb Health Sciences Library, the Children’s Research
Institute, National Institutes of Health, and numerous other research
institutions.

This is a STEM-designated program.

Visit the Integrated Biomedical Sciences program website (https://ibs.smhs.gwu.edu/) for additional information.

ADMISSIONS

Admission deadlines:
- Fall – December 1

Standardized test scores:
- The GRE general exam is not required.
- The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor’s, master’s, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction.
- Minimum scores for the program are:
  - Academic IELTS: an overall band score of 7.0 with no individual score below 6.0; or
  - TOEFL: 600 on paper-based or 100 on Internet-based; or
  - PTE Academic: 68;

Recommendations:
- Three (3) recommendations required:

Prior academic records:
- Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission. If transcripts are in a language other than English, English language translations must be provided. The English translation alone should be uploaded into your application.

Prerequisite requirements:
- A bachelor’s degree in biological sciences, chemistry, or a related field.

Statement of purpose:
- In an essay of 250 – 500 words, state your purpose in undertaking graduate study in your chosen field. Include your academic objectives, research interests, and career plans. Also discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned on the application.

Interview:
- An interview is required.

Additional requirements:
- A Curriculum Vitae is required.

International applicants:
- Please follow this link - https://columbian.gwu.edu/international-graduate-applicants/ - to review the International Applicant Information carefully for details on required documents and English language requirements.

Supporting documents not submitted online should be mailed to:
- Columbian College of Arts and Sciences, Office of Graduate Studies
- The George Washington University
- 801 22nd Street NW, Phillips Hall 107
- Washington DC 20052

For additional information about the admissions process visit the Columbian College of Arts and Sciences Frequently Asked Questions (https://columbian.gwu.edu/graduate-admissions-faq/) page.

Contact:
- askccas@gwu.edu
- 202-994-6210 (phone)
Hours: 9:00 am to 5:00 pm, Monday through Friday

REQUIREMENTS

The following requirements must be fulfilled:

The general requirements stated under Columbian College of Arts and Sciences, Graduate Programs (https://bulletin.gwu.edu/arts-sciences/#degreeregulationtext).

The requirements for the Doctor of Philosophy Program (https://bulletin.gwu.edu/arts-sciences/#doctoraltext).

72 credits, including required core and elective courses. Successful completion of a grant-style qualifier examination is required for advancement to candidacy. In addition, students perform full-time research in faculty laboratories for the duration of their program.

Students are advised to complete 45 credits in the first two years of PhD study comprising required interdisciplinary core courses, required genomics core courses, electives, and advanced readings and research. Upon successful completion of a grant-style qualifier, students register for up to 27 credits of dissertation research through completion and successful oral defense of a written dissertation.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td><strong>Required interdisciplinary core</strong> <code>&lt;sup&gt;*&lt;/sup&gt;</code></td>
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<tr>
<td>BMSC 8210</td>
<td>Genes to Cells</td>
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<tr>
<td>BMSC 8212</td>
<td>Systems Physiology</td>
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<tr>
<td>BMSC 8215</td>
<td>Lab Rotations (Taken three times for a total of six credits)</td>
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<tr>
<td>BMSC 8216</td>
<td>Scientific Writing, Presentation Skills, and Seminar Planning</td>
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<tr>
<td>BMSC 8217</td>
<td>Ethics and Grant Writing</td>
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<tr>
<td>BMSC 8218</td>
<td>Career Options in the Biomedical Sciences</td>
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<tr>
<td>BMSC 8230</td>
<td>Molecular Basis of Human Disease</td>
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<tr>
<td>BMSC 8235</td>
<td>Applied Biostatistics for Basic Research</td>
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<tr>
<td></td>
<td><strong>Required genomics core</strong> <code>&lt;sup&gt;*&lt;/sup&gt;</code></td>
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<tr>
<td>GENO 8231</td>
<td>Introduction to Genomics, Proteomics, and Bioinformatics</td>
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<tr>
<td>GENO 8234</td>
<td>Genomics and Precision Medicine Seminar (Taken two times for a total of two credits)</td>
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<tr>
<td></td>
<td><strong>Electives</strong></td>
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<td>20 credits elective courses selected in consultation with graduate program advisor.</td>
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<tr>
<td>ANAT 6130</td>
<td>Clinically Oriented Human Embryology</td>
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Doctor of Philosophy in the Field of Genomics and Bioinformatics
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PHAR 6116</td>
<td>Pharmacogenomics and Personalized Medicine</td>
</tr>
<tr>
<td>PHAR 6205</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>PHAR 6206</td>
<td>Advanced Pharmacology</td>
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<tr>
<td>PHAR 6322</td>
<td>Advanced Professional and Communication Skills</td>
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<tr>
<td>PHAR 8211</td>
<td>Physiology</td>
</tr>
<tr>
<td>PHAR 8281</td>
<td>Molecular Pharmacology and Neurobiology of Excitable Tissues</td>
</tr>
<tr>
<td>PUBH 6276</td>
<td>Public Health Microbiology</td>
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<tr>
<td>PUBH 6278</td>
<td>Public Health Virology</td>
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<tr>
<td>PUBH 6861</td>
<td>Public Health Genomics</td>
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**Dissertation research (6-27 credits)**

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<tr>
<td>GENO 8999</td>
<td>Dissertation Research</td>
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*Required courses may be waived at the discretion of the graduate program director based on written documentation of prior equivalent coursework. Any waiver increases the number of electives required, by the number of credits waived.*