

# HUMAN GENETICS AND MOLECULAR BIOLOGY, PHD

## Ph.D. Program

The Johns Hopkins Predoctoral Training Program in Human Genetics educates students in human biology and all aspects of human genetics and genomics including health and disease.

The overall objective of the Human Genetics program is to provide our students with a strong foundation in basic science by exposure to a rigorous graduate education in genetics, genomics, molecular biology, cell biology, biochemistry and biostatistics as well as a core of medically-related courses selected to provide knowledge of human biology in health and disease.

The Human Genetics Program has partnering with the Johns Hopkins Bloomberg School of Public Health (JHSPH) and the National Human Genome Research Institute (NHGRI) to create the Maryland Genetics, Epidemiology, and Medicine Training Program (MD-GEM), funded by the Burroughs Wellcome Fund MD-GEM takes a multidisciplinary approach by combining the expertise of all three institutions, to foster the development of a new generation of scientists. Interested Human Genetics students can participate in this additional training.

This program is also offered as training for medical students in the combined M.D./Ph.D. program. Students apply to the combined program at the time of application to the M.D. program. (See section entitled Medical Scientist Training Program).

## Research Facilities

Research laboratories are well equipped to carry out sophisticated research in all areas of genetics. The proximity to renown clinical facilities of the Johns Hopkins Hospital, including the Department of Genetic Medicine, and Oncology Center provides faculty and students with access to a wealth of material for study. Computer and library facilities are excellent. Because the program in human genetics is a university-wide activity, supporting facilities are extensive.

## Financial Aid

The program is supported by a limited number of teaching assistantships and predoctoral training funds from the National Institutes of Health. These fellowships, which are restricted to United States citizens and permanent United States residents, cover tuition and provide monthly stipends and are awarded to essentially all students in the program. Students are encouraged, however, to apply for fellowships from outside sources (e.g., the National Science Foundation, Howard Hughes Medical Institute) before entering the program.

## Program Requirements

The courses include the required core courses: Molecular Biology and Genomics, Fundamentals of Genetics, Cell Structure Pathways and Regulation, Human Genetics, Bioinformatics, Evolution of the Concept of a Gene, Basic Mechanisms of Disease, Molecular Mechanisms of Disease and Statistics for Lab Scientists I & II listed in the entries of the departments of Cell Biology, Anatomy, Molecular Biology and Genetics, Biological Chemistry, Pathology, Medicine and Biology. Numerous elective courses are available and are listed under sponsoring departments.

The courses offered by the faculty of the program are listed below. All courses are open to graduate students from any university program as well as selected undergraduates with permission of the course director. Prerequisite: Introductory course in genetics.

Students must complete three research rotations before deciding on their thesis lab. They must also participate in the Responsible Conduct of Research sessions offered by the Biomedical Program; starting at year 3, students must attend at least two Research Integrity Colloquium lectures per year.

Our students participate in weekly journal clubs, department seminars, monthly Science & Pizza presentations as well as workshops given twice a year on diversity, identity and culture.

At the end of the second year, students take their Doctoral Board Oral Examination. Annual thesis committee meetings must be held following successful completion of this exam.

Average time for completion is 5.5 years.

Code	Title	Credits
ME.710.700	Advanced Topics in Human Genetics	
ME.710.702	Molecular Mechanisms Of Disease	
ME.710.737	Introduction to Computational Genetics	
ME.710.738	Human Genetics: Consequences of Mendelian Transmission	

Our graduates go on to positions in academia, law, medicine, teaching, government as well the private sector. We encourage our students to pursue whatever career they desire. They are encouraged to participate in the internship program providing by the Professional Development Career Office of the School of Medicine.