DRISKILL GRADUATE TRAINING PROGRAM IN LIFE SCIENCES

https://www.feinberg.northwestern.edu/sites/dgp/index.html

Degree Types: PhD

The Walter S. and Lucienne Driskill Graduate Training Program in Life Sciences (https://www.feinberg.northwestern.edu/sites/dgp) (DGP) combines graduate study in biochemistry and structural biology, cancer biology, cell biology, developmental biology, genetics and genomics, immunology, microbiology, neurobiology, pharmacology, systems biology, and biomedical informatics into a single program. More than 140 faculty members are available as dissertation research advisors, and their interests cover a wide range of research in contemporary biomedical and life sciences.

The DGP provides each student the flexibility needed to design a personal course of study, pursue individual research interests, and choose an appropriate thesis advisor. The wide range of research opportunities within the DGP serves students well - both those who enter graduate school committed to a specific research field and those who begin with many potential interests. Flexibility and ease in pursuing diverse interests are the hallmarks of graduate training in the DGP.

Degrees Offered

- Driskill Graduate Training Program in Life Sciences PhD (https://catalogs.northwestern.edu/tgs/driskill-graduate-training-life-sciences/driskill-graduate-training-program-life-sciences-phd)
- Life Sciences and Clinical Investigation Dual Degree MS/PhD (https://catalogs.northwestern.edu/tgs/life-sciences-clinical-investigation-dual-degree/life-sciences-clinical-investigation-dual-degree-ms-phd)

Driskill Graduate Training Program in Life Sciences Courses

IGP 401-0 Biochemistry I (1 Unit)
Structures and properties of proteins, nucleic acids, and polymers, complex and simple carbohydrates, and lipids; thermodynamic principles applied to biologic systems; molecules; structural correlates and functional expressions.

IGP 403-0 Advanced Immunology (1 Unit)
Topics in immunology. Discussion of current experimental papers.

IGP 405-0 Cell Biology (1 Unit)
Structure and function of cells and their organelles. Morphological, molecular, and physiological approaches to solving cell-biological problems.

IGP 410-0 Molecular Biology (1 Unit)
Topics in molecular biology and the mechanisms of gene and cellular regulation. Prerequisites: Past or simultaneous enrollment in IGP 401-0 or equivalent.

IGP 420-0 Introduction to Pharmacology (1 Unit)
This lecture-based course begins with an introduction to the basic principles of pharmacology, namely pharmacodynamics (what the drug does to the body) and pharmacokinetics (what the body does to the drug). The subsequent topics apply these basic pharmacological principles to a discussion of the normal physiology, the pathophysiological processes that produce disease, and the targeted pharmacological treatment of disease. This integrated physiological, pharmacological and clinical approach will be applied to the following global topics in sequence: Neuropharmacology (Peripheral and Central Nervous Systems), Antimicrobial and Anticancer Chemotherapy, Cardiovascular and Renal Physiology and Pharmacology, Endocrine and Immunopharmacology.

IGP 422-0 Introduction to Translational Research (1 Unit)
This course is intended to introduce basic life sciences and clinical research graduate students to the thought processes involved in human disease research and its translation into therapy by providing an overview of disease processes, how they are treated, how basic biological science is used to develop those treatments, and the role of various stakeholders in the translational research pipeline. At the end of this course the student should understand the medical rationale for studying basic pathomechanisms and how to utilize that rationale to design studies and grant proposals. In addition, the student will obtain background knowledge for further, disease- or organ-specific upper-level courses.

IGP 425-0 Topics in Drug Discovery (1 Unit)
Key precedents and contemporary topics in drug discovery research in academia and industry. Principles of drug design and action, pharmacogenetics, macromolecular target identification and characterization, bioassays and animal models of disease, study design and information management.

IGP 430-0 Genetics (1 Unit)
Genetics of prokaryotic and eukaryotic organisms; gene regulation and variation; chromosome structure and behavior; linkage and recombination; quantitative and population genetics; biochemical and developmental genetics; and manipulation of genes in organisms, including humans.

IGP 433-0 Advanced Microbial Pathogenesis (1 Unit)
Properties of microorganisms important in the pathogenesis genesis of infectious diseases. Emphasis on molecular aspects of virulence as they relate to host-parasite interactions.

IGP 435-0 Signal transduction and human diseases (1 Unit)
Integrated discussion of different superfamilies of signaling receptors and their effectors. Pathways discussed include G-protein linked, growth factors and cytokines, nuclear receptors and transcription factors.

IGP 436-1 Drugs and the Brain (1 Unit)
Graduate neuropharmacology course with a mix of didactic instruction (33%) and in-depth classroom discussion of primary research papers (66%). The course is not a survey course, but rather will cover selected topics in neuropharmacology with the goals of 1) informing the student of the latest neuropharmacology knowledge, 2) inculcating a rigorous approach to examination of the scientific literature, and 3) encouraging best practices in experimental design.

IGP 440-0 Immunology (1 Unit)
An integrated view of contemporary immunology: antigens, antibodies, humoral and cell-mediated immune responses, cellular interactions, and regulation of immune responses.

IGP 442-0 Microbiology (1 Unit)
Structure and function, taxonomy and replication of infectious agents. Host-parasite interactions and microbial diseases.
The molecular basis of natural history course will examine important examples from Nature and use the approaches of biochemistry, molecular biology and genetics to categorize and analyze the natural products produced by bacteria, plants and animals and examine how they have impacted human history. Most 2 hour sessions will be devoted to a particular topic. After an introduction by faculty, course participants will examine the subject further through the discussion of assigned papers from the literature or other texts. Some sessions will also be devoted solely to presentations of topics by the students. All students will submit and essay on a topic covered by the course or a related topic in natural history.

IGP 494-0 Colloquium on Integrity in Biomedical Research (0 Unit)

Required by National Institutes of Health (NIH) but does not count as one of the required IGP courses.

IGP 495-0 Science and Society (0 Unit)

Exploration of the foundations of modern science and discussion of how these ideas impact social issues in the biomedical sciences (creationism, abortion, euthanasia, eugenics, cryogenics, replacement therapies, animal rights).

IGP 496-1 Introduction to Life Science Research (0 Unit)

Provides first-year IGP students with tools to develop the knowledge base and skill set necessary for competent research.

IGP 496-2 Introduction to Life Science Research (0 Unit)

Provides first-year IGP students with tools to develop the knowledge base and skill set necessary for competent research.

IGP 496-3 Introduction to Life Science Research (1 Unit)

Provides first-year IGP students with tools to develop the knowledge base and skill set necessary for competent research.

IGP 499-0 Independent Study (1-3 Units)

SEE DEPT FOR SECTION AND PERMISSION NUMBERS.

IGP 500-0 Research (1-3 Units)

Independent investigation of selected problems pertaining to thesis or dissertation.