Molecular Genetics and Microbiology Department

Chair
David Thanassi, Life Sciences Building 280C (631) 632-4549

Graduate Program Director
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Graduate Program Coordinator
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Degree Awarded
Ph.D. in Molecular Genetics and Microbiology

Web Site
http://www.mgm.stonybrook.edu/index.shtml

Application
https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=sunysb-gs

Molecular Genetics and Microbiology Department

Graduate study in Molecular Genetics and Microbiology offers a diversified course of study leading to the Ph.D. degree. The major areas of study are the basic mechanisms of viral, bacterial, and fungal pathogenesis, immunology, and cancer biology.

Studies are directed toward an understanding of cell biology, molecular genetics, immunology, and microbial pathogenesis and are designed to prepare a student to become an effective research scientist.

Admission Requirements of Molecular Genetics and Microbiology

Pre-doctoral trainees in Molecular Genetics and Microbiology are admitted to the Graduate School of Stony Brook University by application to the Program.

In addition to the minimum Graduate School requirements, the following elements are considered when making admissions decisions:

A. Undergraduate performance in science courses.
B. Percentile on the Graduate Record Examination (GRE) General Test.
C. Three letters of recommendation.

The program does not require, but prefers to see, evidence of research activity at the time of application. Whenever possible, prospective students are invited to Stony Brook for interviews with the Program faculty.

All students who are accepted into the Molecular Genetics and Microbiology Program are accepted with full support. The level of support for 2019 is $29,000 per calendar year plus full tuition scholarship. Health insurance is provided for all students as a fringe benefit.

Facilities of Molecular Genetics and Microbiology Department

The Department of Molecular Genetics and Microbiology occupies the second floor of the Life Sciences Building as well as space on the lower level, first and third floors of the Life Sciences Building. Program faculty members’ laboratories are also located on the first, second and third floors of the Centers for Molecular Medicine (CMM) and within other departments at Stony Brook University and Cold Spring Harbor Laboratory. Approximately 47,000 square feet of research space are available within the Department of Molecular Genetics and Microbiology. Each research laboratory is fully equipped, and, in addition, the Department provides access to a variety of communal central facilities and services. These include a flow cytometry facility, glassware washing and sterilization facility, analytical equipment lab, deconvolution microscopy facility, environmental rooms, and darkrooms. Major items of equipment are organized into these central facilities, which are readily available to trainees. The Centers for Molecular Medicine, a state-of-the-art research and teaching facility, serves as a physical and intellectual bridge between investigators in the adjacent Life Sciences Building and the nearby University Health Sciences Center. The Health Sciences Library and Barry S. Coller Learning Center, located in the Health Sciences Center, contains collections of biological and medical books and journals presently totaling 262,000 volumes, including more than 3,200 journal titles. In addition, the Health Sciences Library provides access to more than 2,300 full-text electronic journals. Other campus libraries include the Frank Melville, Jr. Memorial Library

Requirements for the Ph.D. Degree in Molecular Genetics and Microbiology

The predoctoral training program offers its students the opportunity to study questions in virology, bacteriology, mycology, immunology, biochemistry, cancer biology, and cell and developmental biology utilizing the experimental approaches of the molecular biologist and geneticist.

Instruction and course planning involve faculty members from the Department of Molecular Genetics and Microbiology and selected members from the Departments of Biochemistry and Cell Biology, Medicine, Pathology, Physiology and Biophysics, and Pharmacology, and from Cold Spring Harbor Laboratory. The general philosophy of the Program is that a successful research career in the diverse and heterogeneous area of molecular biology requires a broadly-based background, familiarity with at least all of the above areas, and a frame of mind that is receptive to new approaches.
The Department of Molecular Genetics and Microbiology has an active seminar program of outside speakers who present topics relevant to molecular genetics and microbiology, and there is a yearly retreat in which ongoing research in the Department and recent progress in the field are presented and discussed. This retreat is held early in the fall in order to introduce new students to the faculty, to other students, and to the areas of ongoing research within the Department. The Department also presents a colloquium periodically on human diseases, with outstanding scientists from throughout the world presenting their current work on the selected topic. Students in the program are encouraged to attend all of these programs as part of their training.

In addition to the minimum requirements of the Graduate School, the following are required:

**A. Course Requirements**

It is the policy of the Department of Molecular Genetics and Microbiology that a student must obtain a grade of B or higher in each course. The decision to have students who receive a final grade below 3.0 re-take a course will be made by the Program’s Executive Committee on a case-by-case basis.

**First Year**

*Fall*
- MCB 520 Graduate Biochemistry I
- HBM 503 Molecular Genetics
- HBM 509 Experimental Molecular Genetics and Microbiology (laboratory rotations)*
- HBM 690 Molecular Genetics and Microbiology Seminar
- GRD 500 Integrity in Science

*Spring*
- HBM 522 Biology of Cancer
- MCB 656 Cell Biology
- HBM 510 Experimental Molecular Genetics and Microbiology (laboratory rotations)*
- HBM 690 Molecular Genetics and Microbiology Seminar
- HBM 692 Experimental Methods in Molecular Genetics and Microbiology
- Teaching Practicum

*Students rotate through three different laboratories over the course of their first year. At the end of that year, students must identify and enter the laboratory in which they will conduct their graduate and dissertation research.*

*Summer*
- HBM 800 Full-time Summer Research

**Second Year**

*Fall*
- HBM 640 Molecular Mechanisms of Microbial Pathogenesis
- HBP 533 Immunology
- HBM 599 Graduate Research
- HBM 690 Molecular Genetics and Microbiology Seminar
- HBM 691 Readings in Molecular Genetics and Microbiology Literature

*Spring*
- HBM 599 Graduate Research
- HBM 690 Molecular Genetics and Microbiology Seminar
- HBM 693 Research Proposal Preparation in Molecular Genetics and Microbiology

*Summer*
- HBM 800 Full-time Summer Research

**Third Year Until Completion**
Students register for HBM 599 Graduate Research every fall and spring semester until they advance to candidacy at which time they register for HBM 699 Dissertation Research every fall and spring semester. Students register for HBM 800 Full-time Summer Research every summer until graduation.

B. Qualifying Exam
After the successful completion of all required courses, the student must write and defend a research proposal in an area distinct from his/her graduate research for the qualifying exam.

C. Dissertation Proposal Exam
Within 10 months of passing the qualifying exam, each student submits a written proposal of his or her dissertation research (similar to an NIH grant proposal) and orally defends the proposal before his or her dissertation committee shortly thereafter.

D. Advancement to Candidacy
After successfully completing all required and elective courses, the qualifying exam, and the dissertation proposal exam, the student will be recommended to the Graduate School for advancement to candidacy.

E. Attendance and Participation in Student Seminar
After being advanced to candidacy, the student is expected to register for HBM 690 every fall and spring semester and participate actively in the seminar series. Students who perform their graduate and dissertation research off-campus are expected to participate in a similar seminar series at their off-campus location.

F. Ph.D. Dissertation
The research for the Ph.D. dissertation is conducted under the supervision of the dissertation committee, which is appointed by the Program and approved by the Dean of the Graduate School. A formal public oral defense of the dissertation is scheduled, at which the student presents his or her research and is questioned by members of the dissertation committee and other members of the audience. A closed oral examination before the dissertation committee follows the seminar.

G. Teaching Practicum
It is expected that each graduate student completing a doctoral degree will have functioned as a teaching assistant during at least one semester of his or her graduate studies.

H. Publication Requirement
All students must be the first author of at least one publication of original research in order to graduate. Students may schedule the dissertation defense, with the approval of the dissertation advisor and advisory committee, once the first-author manuscript has been submitted for publication.

Faculty of Molecular Genetics and Microbiology Department

Toll Distinguished Professors
Benach, Jorge, Ph.D., 1971, Rutgers University: Pathogenesis of spirochetal infections and their host responses. Distinguished Professors
Wimmer, Eckard, Ph.D., 1962, University of Gottingen, Germany: The molecular biology of poliovirus replication and the molecular basis of picornaviral pathogenesis.

Professors
Bliska, James B., Ph.D., 1987, University of California, Berkeley: Molecular and cellular basis of bacterial-host interactions.
Carter, Carol A., Ph.D., 1972, Yale University: HIV and retroviral assembly and replication.
Del Poeta, Maurizio, M.D., 1992, University of Ancona, Italy: Role of sphingolipids in mediating signaling pathways and fungal pathogenesis.
Fries, Bettina1, M.D., 1991, Albert Ludwig Universitaet Freiburg, Germany: Staphylococcal enterotoxin B; Cryptococcal neoformans pathogenesis
Hearing, Patrick, Ph.D., 1980, Northwestern University: Viral molecular genetics; eukaryotic transcriptional regulation; gene therapy.
Konopka, James B., Ph.D., 1985, University of California, Los Angeles: G-protein coupled receptor signal transduction; fungal pathogenesis (Candida albicans).
Li, Ellen1, M.D., Ph.D., 1986, Washington University: Inflammatory bowel diseases.
Marshall, Nancy Reich, Ph.D., 1983, University at Stony Brook: Signaling switches in gene expression by hormones or viral infection.
Thanassi, David, Ph.D., 1995, University of California, Berkeley: Secretion of virulence factors by bacterial pathogens; pilus biogenesis by uropathogenic E. coli.

**Associate Professors**

Bhaduri-McIntosh, Sumita, M.D., Ph.D., 1991, Byramjee Jeejeebhoy Medical College: Epstein-Barr virus-host interactions

Carpino, Nicholas, Ph.D., 1997, University at Stony Brook: Positive and negative regulation of T cell receptor signaling.

Hearing, Janet C., Ph.D., 1984, University at Stony Brook: Influenza virus drug development.

Karzai, Wali, Ph.D., 1995, Johns Hopkins University: Structure and function of RNA-binding proteins and biochemical studies of the SmpBSSrA quality control system.

Krug, Laurie, Ph.D., 2001, Emory University: Virus-host interactions during chronic gammaherpesvirus infection.


van der Velden, Adrianus, Ph.D., 2000, Oregon Health and Science University: Salmonella pathogenesis.

**Assistant Professors**

Kumar, Pawan, DVM, PhD, 2009, University of Southampton, UK: Immunology and intestinal microbiota.

Seeliger, Jessica, Ph.D., Stanford University: Membrane biosynthesis, structure and behavior in bacterial pathogenesis

Sheridan, Brian, Ph.D., 2008, University of Pittsburgh: Mucosal immunity to microbial pathogens

**Adjunct Faculty**

Stillman, Bruce W., Professor, Ph.D., 1979, Australian National University: Mechanism of eukaryotic DNA replication. Research Faculty

Boon, Elizabeth, Associate Professor, Ph.D., 2002, California Institute of Technology: Biofilms.

Hannun, Yusuf, Professor, M.D. American University in Beirut, Lebanon, 1983: lipid mediators of cancer cell signaling.

Kew, Richard, Associate Professor, Ph.D., 1986, Stony Brook University: Leukocyte chemotaxis; inflammation; pulmonary immunopathology.

Krainer, Adrian, Professor, Ph.D., 1986, Harvard University: Posttranscriptional control of gene expression; alternative splicing; splicing in genetic diseases and cancer; antisense therapeutics.

London, Erwin, Professor, Ph.D., 1979, Cornell University: Membrane protein folding and lipid interaction.

Moll, Ute, Professor, M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Neiman, Aaron, Professor, Ph.D., 1994, University of California, San Francisco: Vesicle trafficking and intracellular signaling in yeast.

Obeid, Lina, Professor, M.D., 1983, American University in Beirut, Lebanon: signaling lipids in cell stress and disease.

Tonge, Peter J., Professor, Ph.D., 1986, University of Birmingham: Enzyme mechanisms and rational drug design.

Vakoc, Christopher, Assistant Professor, M.D., Ph.D., 2007, University of Pennsylvania: chromatin regulators and oncogenic signal transduction cascades.


Number of teaching, graduate, and research assistants, fall 2018: 23

- Joint appointment, Department of Medicine
- Joint appointment, Department of Pathology
- Joint appointment, Department of Pediatrics
- Joint appointment, Department of Biochemistry and Cell Biology
- Joint appointment, Department of Pharmacological Sciences
- Cold Spring Harbor Laboratory
- Department of Chemistry

Stony Brook University Graduate Bulletin: www.stonybrook.edu/gradbulletin
MOLECULAR GENETICS AND MICROBIOLOGY (HBM)

- Department of Medicine
- Department of Pathology
- Department of Biochemistry and Cell Biology
- Department of Pharmacological Sciences

NOTE: The course descriptions for this program can be found in the corresponding program PDF or at COURSE SEARCH.