

# Molecular Medicine Ph.D. Program

Sponsored by the  
Cleveland Clinic Lerner College of Medicine  
of Case Western Reserve University

Funded in collaboration with the  
Howard Hughes Medical Institute



## WHAT IS THE MOLECULAR MEDICINE PH.D. PROGRAM?

The Molecular Medicine Ph.D. Program is a unique collaborative graduate training opportunity that integrates medical knowledge into graduate training. The goal of this program is to produce scientists trained in translational research – basic or applied research relevant to human health and disease that can lead to new understanding of disease, clinical and diagnostic tools, medications, and therapies. This program is consistent with National Institutes of Health Roadmap directives.

Students train rigorously to apply basic science discoveries to human health and to the causes and treatments of human disease. The mastery of competencies necessary to translate scientific observations from the research bench to clinical care is the focus of this Ph.D. program. Graduates will be well prepared to collaborate with physicians and for the challenge of using molecular and cellular biology to advance human health.



## WHAT ORGANIZATIONS ARE INVOLVED IN THIS PROGRAM?

The Department of Molecular Medicine of the Cleveland Clinic Lerner College of Medicine (CCLCM) of Case Western Reserve University was created to integrate research activities of Cleveland Clinic scientists in the Lerner Research Institute, home to the laboratory-based research at the Cleveland Clinic, into the Case community. The Molecular Medicine Ph.D. program is offered through the Case School of Graduate Studies. The Ph.D. trainers and clinical co-mentors are from the Cleveland Clinic, Case, and other area hospitals/health science centers. The program is administered on the Cleveland Clinic campus. The core curriculum courses are taught on the Cleveland Clinic campus, with advanced electives available on both the Cleveland Clinic and Case campuses. Students may perform their thesis research at either campus with an approved trainer in the program.



The Case School of Medicine was founded in 1843, and has been at the forefront of medical education and research. There are 14 basic science departments with numerous advanced degree programs offered.

*U.S. News & World Report* consistently ranks the Cleveland Clinic among the nation's top 10 medical centers. The Lerner Research Institute is home to laboratory-based and translational research at the Cleveland Clinic. The Institute's more than 150 Faculty inves-

tigators have appointments in the Department of Molecular Medicine of CCLCM. Research at the Institute focuses on disease-oriented programs, including cancer, cardiovascular, neurologic, musculoskeletal, eye, allergic and immunologic, metabolic, and infectious diseases.

## WHY IS THE MOLECULAR MEDICINE PH.D. PROGRAM UNIQUE?

- Focus on translational research in which students train in a collaborative environment that applies basic research for the understanding, prevention, and treatment of human diseases
- Coursework begins with the study of human physiology and disease and continues to integrate clinical correlates throughout the curriculum
- Exposure to clinical research literature, methods, and statistics
- The opportunity to work with both a Research Thesis Advisor and a Clinical Mentor
- Coursework includes an independent study “Clinical Experience” developed with the Clinical Mentor to participate in clinical case and research presentations, and other clinical activities connected to the student’s disease focus
- Support, including tuition and stipend, by the prestigious Howard Hughes Medical Institute



## HOW DO I APPLY FOR THE PH.D. PROGRAM IN MOLECULAR MEDICINE?

You can apply online at:

<http://www.lerner.ccf.org/molecmed/>

Once your application is complete, your information will be forwarded to the Admissions Committee of the Department of Molecular Medicine. An interview and tour will be scheduled for competitive applicants.

## WHAT COURSES WILL I TAKE?

The Molecular Medicine Ph.D. Program starts in July. You will take a course in Human Physiology and Disease as a foundation for molecular medicine research and discovery. You also will start the first of three lab rotations that continue throughout the year, which will assist you in choosing your thesis lab and expose you to a wide variety of protocols and biological systems. Also continuing through the year, you will attend the weekly Frontiers in Molecular Medicine research seminars by program mentors and advanced students, as well as student-led journal clubs.



During the fall and spring semesters, you will take the “Fundamentals of Molecular Medicine” core course that is divided into six modules:

- Biochemistry
- Metabolism and Pharmacology
- Nucleic Acids and Gene Regulation
- Mammalian Genetics
- Cell Biology
- Infection and Immunity

At the start of the second year, you will take “Principles of Clinical Research for the Ph.D. Investigator” to learn about clinical trials, statistics, and regulatory and ethical issues. You will also select your Thesis Research

Mentor, a Clinical Mentor, and your Thesis Committee. In the fall semester of your second year you will take the independent study Clinical Experience course, organized with your Clinical Mentor, to observe clinical settings and gain experience in the disease which is the subject of your thesis research. During your second year you will also take elective coursework that complements your thesis research topic, work in your thesis lab, participate in a journal club, and take a qualifying exam. Subsequent years are largely devoted to your research and your thesis.

## WHO WILL BE ON MY PH.D. THESIS COMMITTEE?

A Thesis Committee will be appointed by the end of the second summer with consultation between the Research Advisor and the Graduate Program Director. The Thesis Committee will be comprised of the Research Advisor, Clinical Mentor, and two other Case Faculty members.

## WILL I HAVE FINANCIAL SUPPORT?

All students accepted into the Molecular Medicine Ph.D. Program will receive a stipend and free tuition throughout their graduate training. Health insurance will be provided through Case.

## WHAT ABOUT STUDENT ORGANIZATIONS?

Molecular Medicine Ph.D. students can participate in the student programs at both Case and the Cleveland Clinic's Lerner Research Institute. The Lerner Research Institute's Graduate Student Activities Committee plans and provides academic and social functions for all graduate students working in labs at the Cleveland Clinic. New graduate students are encouraged to join this group to facilitate both social and professional networking in the Institute's research community.



## WHAT ABOUT GRADUATION?

Upon successful completion of all coursework, research requirements, and thesis (including defense of your research project), you will graduate with a Ph.D. in Molecular Medicine from Case.

## WHERE DO I GO FOR DETAILS REGARDING THE PH.D. PROGRAM, LIVING IN CLEVELAND, CASE, THE CLEVELAND CLINIC AND THE LERNER RESEARCH INSTITUTE?

Case and the Cleveland Clinic are located near each other in University Circle, five miles east of downtown Cleveland. University Circle is the cultural, medical, and education center of Cleveland and Northeast Ohio and is home to many of Cleveland's finest museums and the world-renowned Cleveland Orchestra. University Circle's research institutions, Case, University Hospitals, and the Cleveland Clinic have made Cleveland one of the major biomedical research centers in the country. Located on the shores of Lake Erie, Cleveland is one of the most affordable cities in the Midwest.

To apply online and for other helpful links regarding Case and the Cleveland Clinic Lerner Research Institute, please visit:

<http://www.lerner.ccf.org/molecmed/>

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