



EMORY
LANEY
GRADUATE
SCHOOL



GRADUATE DIVISION OF BIOLOGICAL AND BIOMEDICAL SCIENCES

MOLECULAR AND SYSTEMS PHARMACOLOGY

The Molecular and Systems Pharmacology (MSP) graduate program at Emory University has a lot to offer students interested in learning how the drugs of today work and how the novel therapeutics of tomorrow can revolutionize healthcare. The program also offers broad training in the biomedical sciences to prepare students for diverse careers in medical research.

Each year brings the development of exciting new therapeutics in the treatment of cancer, heart disease, AIDS, diabetes, psychiatric disorders, and other diseases. Pharmacology seeks to understand how such therapeutics work and uses this knowledge, along with techniques such as molecular modeling and computer-aided design, to drive the development of revolutionary new therapies and drugs. Pharmacology also includes toxicology, the study of the adverse effects of certain drugs and environmental pollutants.

STUDY WITH THE BEST

Emory University was recently rated by *The Scientist* magazine as the #1 university in the world in terms of impact in pharmacology and toxicology research. Particular strengths within the MSP program include neuropharmacology, cancer biology, AIDS research, cardiovascular pharmacology, toxicology, cellular signaling, and chemical biology. Trends in NIH funding rank Emory among the fastest growing medical centers in the USA. At Emory your thesis research will be

PROFESSIONAL DEVELOPMENT

The Laney Graduate School offers a range of programs that encourages students to develop their professional skills, engage with broader professional communities, and prepare for their careers.

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carried out with world-class investigators across all areas of the biomedical sciences in state-of-the-art research facilities.

INTERDISCIPLINARY APPROACH

Modern biological research is interdisciplinary and the MSP program is firmly committed to working across a wide range of disciplines. Our program encompasses diverse disciplines, including pharmacology, molecular biology, structural biology, biochemistry, genetics, cell biology, physiology, chemistry, toxicology, microbiology, neuroscience, and others. This cross-discipline approach provides our graduates with numerous possibilities for rewarding careers in research.

During their first year lab rotations, MSP students encounter state-of-the-art research on everything from behavioral responses to drugs of abuse at the Yerkes National Primate Research Center, to environmental causes of Parkinson's disease at the Collaborative Center for Parkinson's Disease Environmental Research, to determining the role of oxidative stress in cardiovascular function. Additionally, many of our investigators are involved in translational research and apply what is learned at the laboratory bench to the clinical setting.

MORE THAN A UNIVERSITY

Emory is one of the most elite and fastest-growing research universities in the world. Major research centers, such as the world headquarters of the U.S. Centers for Disease Control & Prevention (CDC) often collaborate with Emory faculty on research projects.

Many graduate students in the MSP program belong to the Georgia Biomedical Partnership (GBP, www.gabio.org), a non-profit organization that regularly brings together graduate students and post-doctoral fellows with scientists and CEOs from top biotechnology and pharmaceutical companies. These events are a great way for graduate students to learn about the career opportunities in industry and to also make connections with industry professionals.



FACULTY

The MSP program has over 40 faculty members. These mentors represent a wide range of science departments, such as Biochemistry, Cell Biology, Chemistry, Genetics, Microbiology, Immunology, Pathology, Pharmacology, and Physiology, as well as clinical departments such as Medicine, Neurology, Pediatrics, Psychiatry, Psychology, and Surgery.

Emory scientists do revolutionary work. Three Emory scientists, including MSP program faculty member Dr. Dennis Liotta, developed Emtriva, a new anti-HIV therapy which was recently sold to Gilead Sciences for \$525 million. This sum represents the largest intellectual property agreement ever in the history of American universities. The development of Emtriva is just one example of the many ways in which Emory scientists are at the forefront of pharmacological research.

Please visit our website for a complete list of our faculty, with contact information and research specialties, at www.pharm.emory.edu/MSP/faculty.html.

STUDENTS

The MSP program has approximately 55 students in residence, and typically accepts 8 – 12 new students each year. Our students come from a variety of backgrounds. Most have a strong undergraduate background in the biological, physical, or behavioral sciences and would like to pursue advanced study focused on drug action in biological systems.

Many are interested in broadening their career choices and looking beyond more traditional graduate programs. The Molecular and Systems Pharmacology Program exposes them to numerous diverse fields and provides training for basic scientific research, for commercially driven research, or for scientific aspects of regulatory and policy work.

Students graduating from the Emory Molecular and Systems Pharmacology Program continue their training at outstanding laboratories as postdoctoral fellows and continue on to successful careers in industry, academia, law, and government. Listed below are the current positions of a handful of recent MSP graduates:

- Post-Doctoral Fellow, Harvard University
- Post-Doctoral Fellow, University of North Carolina
- Post-Doctoral Fellow, University of Pennsylvania
- Post-Doctoral Fellow, Dana Farber Cancer Institute
- Post-Doctoral Fellow, University of California, Berkeley
- Post-Doctoral Fellow, University of California, Irvine
- Post-Doctoral Fellow, Johns Hopkins University
- Assistant Professor, Vanderbilt University
- Assistant Professor, Emory University
- Assistant Professor, Georgia Perimeter College
- Associate Professor, University of California, San Diego
- Scientific Advisor, Pabst Patent Group, LLP
- Scientific Advisor and Patent Agent, Merial
- Associate Scientist, Agensys Inc.
- Associate Director of Clinical Neuroscience, Pfizer
- Director of Research, SaluMedica
- Scientist, US Intelligence Service
- Staff Scientist, Avigen Corp
- Principal Scientist, Grifols Biologicals Inc.
- Health Scientist, Centers for Disease Control & Prevention
- Medical Science Writer, Articulate Science Inc.
- President & CEO, Rimidi Inc.



CURRICULUM

In the first year, MSP students attend classes focused on the fundamental principles of pharmacology, toxicology, biochemistry, and cell biology. They also get research experience through laboratory rotations.

In the second year and beyond, students focus on dissertation research in their chosen laboratory and also attend a handful of upper-level courses in their specialized areas of interest. These upper-level courses focus on a variety of topics such as signal transduction, receptors, ion channels, molecular toxicology, behavior, neuroscience, cancer biology, cardiovascular biology, and chemistry.

The program also offers students the opportunity to specialize in toxicology. The most important component of the toxicology specialty is training in laboratory research, first as a series of three research rotations, then in the dissertation laboratory. This training is complemented by core courses in toxicology, biochemistry, pharmacology, cell biology, molecular biology, and biostatistics. Specialized toxicology courses, seminars, and journal clubs are also available.

More information about courses and requirements can be found on our website, at http://biomed.emory.edu/PROGRAM_SITES/MSP/index.html.

Students typically complete an MSP doctoral education in 5 to 6 years.

CONTACT INFORMATION

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Chair, MSP Admissions Committee
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About Emory:

Emory University is one of the major biological research and medical referral centers in the Southeast and is among the fastest growing Medical Centers in the United States. Emory is consistently ranked in the top 20 institutions nationally for NIH research support and ranks at or near the top of institutions for students with NIH predoctoral fellowships. Emory is recognized as a leader in higher education in sustainability and has won numerous awards. The Best Colleges has placed Emory in the top 10 in the nation in the categories of greenest universities and the most beautiful college campuses.

The Graduate Division of Biological and Biomedical Sciences (GDBBS) has around 400 graduate students in eight interdisciplinary Ph.D. programs:

- Biochemistry, Cell and Developmental Biology
- Cancer Biology
- Genetics and Molecular Biology
- Immunology and Molecular Pathogenesis
- Microbiology and Molecular Genetics
- Molecular and Systems Pharmacology
- Neuroscience
- Population Biology, Ecology and Evolution

Over 330 world-renowned researchers mentor students admitted to these programs, giving them a unique opportunity to train with faculty at:

- American Cancer Society
- the U.S. Centers for Disease Control and Prevention
- Children's Healthcare of Atlanta, Inc.
- Emory College
- the Robert W. Woodruff Health Sciences Center
- the Rollins School of Public Health
- The Carter Center
- Veterans Administration Medical Center, Atlanta
- the Winship Cancer Institute
- the Yerkes National Primate Research Center

Financial support includes a tuition scholarship, health insurance and a competitive stipend (\$30,000 for the 2017 – 2018 academic year). Funding is guaranteed as long as the student is making satisfactory progress toward their degree. The average time to degree is typically around 5.5 to 6 years. Training is interdisciplinary and students have the flexibility to perform their thesis work with GDBBS faculty outside their chosen program. Students typically perform three rotations before affiliating with a faculty member for their dissertation research.

The application deadline is December 1st for the following fall semester.



Requests for Additional Information:

Recruitment and Admissions
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biomed.emory.edu
biomed.emory.edu/PROGRAM_SITES/MSP



LANEY GRADUATE SCHOOL DEGREE PROGRAMS

Anthropology	<i>Genetics and Molecular Biology</i>	Biomedical Engineering	Development Practice	Health Services Research and Health Policy	Nursing
Art History	<i>Immunology and Molecular Pathogenesis</i>	Biostatistics	Economics	Hispanic Studies	Nutrition and Health Sciences
Behavioral Sciences and Health Education	<i>Microbiology and Molecular Genetics</i>	Business	English	History	Philosophy
Bioethics	<i>Molecular and Systems Pharmacology</i>	Chemistry	Environmental Health Sciences	Islamic Civilizations Studies	Physics
Biological and Biomedical Sciences	<i>Neuroscience</i>	Clinical Psychology	Environmental Sciences	Mathematics	Political Science
<i>Biochemistry, Cell and Developmental Biology</i>	<i>Population Biology, Ecology, and Evolution</i>	Cognition and Development (Psychology)	Epidemiology	MD/PhD	Religion
<i>Cancer Biology</i>		Comparative Literature	Film and Media Studies	Music	Sociology
		Computer Science and Informatics	French	Neuroscience and Animal Behavior (Psychology)	Women's, Gender, and Sexuality Studies