MOLECULAR AND ENVIRONMENTAL TOXICOLOGY, PH.D.

Administrative Unit: Molecular and Environmental Toxicology
College/School: College of Agricultural and Life Sciences, School of Pharmacy, School of Medicine and Public Health
Admitting Plans: M.S., Ph.D.
Degrees Offered: M.S., Ph.D.
Minors and Certificates: Doctoral Minor

Molecular and environmental toxicology is a multidisciplinary subject that involves the study of mechanisms of action of environmental toxicants on humans and other organisms and the behavior of these toxicants in the environment. The UW–Madison Molecular and Environmental Toxicology Center’s graduate program provides students with expert knowledge in at least one specialty plus a broad understanding of other specialties that contribute to the resolution of environmental toxicology problems. The center is sponsored by the School of Medicine and Public Health as well as the College of Agricultural and Life Sciences, the School of Veterinary Medicine and the School of Pharmacy. The center links researchers in numerous academic departments who are working on problems in this area.

An interdisciplinary graduate program leading to the doctor of philosophy or a master of science in molecular and environmental toxicology is offered by the center under the direction of an executive committee composed of faculty affiliated with the center. The program offers two general approaches: mechanisms of pathobiology of chemically induced disease and environmental activities of chemicals. Each approach is subdivided into focal areas including metabolic and genetic toxicology, neurotoxicology, and immunotoxicology; and ecotoxicology, bioremediation, and distribution and assessment of environmental chemicals. All students participate in a core curriculum that addresses these various areas and that is supplemented by other advanced, specialized courses. Students perform research under the guidance of one of the center’s graduate faculty members.

Recipients of graduate degrees in molecular and environmental toxicology pursue careers in governmental agencies (policymaking, regulations, standard setting, or research), private industry (e.g., hazardous waste management, occupational safety, consumer affairs, research and development, or regulatory compliance), and the academic community (teaching and research). The center office maintains specific information concerning career placements.

FINANCING

Financial aid is provided to all students, usually in the form of grant-supported research assistantships, institutional fellowships, or advanced opportunity fellowships for minority or disadvantaged students. Students are encouraged to contact individual professors in their areas of interest to determine whether support is available for working in that lab.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

DOCTORAL DEGREES

Ph.D.

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

51 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

32 credits

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

At least half (26 credits of the required 51) must be in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (http://my.wisc.edu/ CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

Prior coursework that a student wants to have considered must be presented within the first month of UW–Madison residency. Core courses may be appealed, subject to Graduate Achievement Committee approval. Credit total of core course exemptions will need to be made up as electives. Elective credits may be appealed, subject to Graduate Achievement Committee approval; further electives will not need to be taken.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE

Core courses taken as an undergraduate will not need to be retaken, commonly including M&ENVTOX/MEDICINE/ONCOLOGY/PATH/PHM SCI/PHMCOL-M/POP HLTH 625 Toxicology I and M&ENVTOX/MEDICINE/PATH/PHM SCI/PHMCOL-M/POP HLTH 626 Toxicology II from the Pharm/Tox program and M&ENVTOX/AGRONOMY/ENTOM/F&W ECOL 634 Ecotoxicology: Impacts on Populations, Communities and Ecosystems in the F&W Ecol program. Equivalent number of didactic elective credits from graduate-level courses must be taken to fulfill the previously taken credits/courses.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL

Core courses taken as a UW–Madison University Special student will not need to be taken, commonly including M&ENVTOX/MEDICINE/ONCOLOGY/PATH/PHM SCI/PHMCOL-M/POP HLTH 625 Toxicology I and M&ENVTOX/MEDICINE/PATH/PHM SCI/PHMCOL-M/POP HLTH 626 Toxicology II, as a student prepares for the toxicology program. Equivalent number of didactic elective credits from graduate-level courses must be taken to fulfill the previously taken credits/courses.
A committee often accomplishes advising for the students in the early stages of their studies.

**ASSESSMENT AND EXAMINATIONS**

Doctoral students are required to take a comprehensive preliminary/oral examination after they have cleared their record of all Incomplete and Progress grades (other than research and thesis). Deposit of the doctoral dissertation in the Graduate School is required.

**TIME CONSTRAINTS**

Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

**LANGUAGE REQUIREMENTS**

Contact the program for information on any language requirements.

**ADMISSIONS**

To qualify for graduate study in molecular and environmental toxicology, applicants normally have a bachelor’s degree in a biological or physical science, with at least a 3.0 GPA (on a 4.0 scale). The following courses should be completed before entrance to the program: four semesters of chemistry, including at least one of organic (depending on the planned direction within the program, a semester of either analytical chemistry or biochemistry is highly recommended); one semester of math-based physics (a second semester is highly recommended); and three semesters of biology, including coverage of introductory genetics. One or more semesters of calculus is highly recommended. If applicants have not taken one semester of statistics, biometrics, or an equivalent course, and one semester of biochemistry equivalent to the UW–Madison Biochem 501 course, then these courses must be taken as part of the program and will fulfill elective credit requirements for the major. Students with a limited number of deficiencies may be admitted, but must eliminate these deficiencies early in their graduate study. Applicants are required to take the Graduate Record Exam (GRE). International students should also send scores of the Test of English as a Foreign Language (TOEFL), or International English Language Testing System (IELTS).

**LEARNING OUTCOMES**

**KNOWLEDGE AND SKILLS**

- Students will be able to teach science, engaging audiences and helping them to learn.
- Students will demonstrate a didactic knowledge of both molecular toxicology and environmental toxicology.
- Students will be able to design future experiments and present them as a proposal, which contains background information, experimental processes, and account for any set-backs.
- Students will be able to verbally communicate their science and do-so in a clear manner for a variety of audiences.
• Students will be able to write for a proper audience, revising and responding to reviewers as appropriate.

PROFESSIONAL CONDUCT
• Students will understand that science and research is based on trust - trust between scientists and colleagues, trust between scientists and policy makers, trust between scientists and advisory boards, and trust between scientists and society.

PEOPLE

Faculty: See Faculty (http://metc.wisc.edu/people_category/faculty) on program website.