

The Department of Tropical Medicine has a long and proud history of contributions to parasitology and tropical medicine. Although the department had its origins in classical parasitology, its courses and research programs span the breadth of public health problems in the developing world.

Public health degrees offered by the department include the master of public health and tropical medicine (MPH&TM), the master of science in public health (MSPH) in parasitology, and the doctor of science (ScD) in parasitology. Faculty of the Department of Tropical Medicine also comprise the Department of Parasitology in the Tulane University Graduate School. Through that program, the department offers master of science (MS) and doctor of philosophy (PhD) degrees in parasitology for individuals pursuing academic or research careers.

Master of Public Health & Tropical Medicine (MPH&TM)

The MPH&TM program prepares health professionals with clinical backgrounds to deal with the important public health problems of tropical developing countries. By combining a core public health curriculum with coursework on the clinical, epidemiological, and control aspects of tropical diseases, this program prepares physicians to understand tropical medicine from various perspectives; it also prepares the participants to evaluate and plan disease prevention and control programs.

Graduates of the MPH&TM degree program are prepared to:

- Work overseas in disease control programs within tropical developing countries at the local, provincial, national or international level
- Evaluate epidemiologic, clinical, and laboratory data generated by disease control programs in tropical developing countries, and use those data to develop and test new programs to better serve the needs of those countries
- Train paramedical workers to carry out disease programs and evaluate the impact of those workers on disease control
- Teach the most important diagnostic and management aspects of clinical tropical medicine and traveler's health
- Explain the complex biologic, epidemiologic, environmental, social and behavioral aspects of health and disease in developing countries.

Clinical training is provided primarily in classroom and clinical settings in New Orleans, although work

experience abroad can be arranged at the option of the student. The MPH&TM curriculum contains all components of the Diploma course in Clinical Tropical Medicine and Traveller's Health, and the MPH&TM degree since 1998 is also recognized as an approved training program for students seeking certification in Clinical Tropical Medicine and Traveler's Health through the American Society of Tropical Medicine and Hygiene.

Employment opportunities include a wide range of positions with international health organizations and service agencies (WHO, UNICEF), medical missions, ministries of health, and overseas assignments with the military or the U.S. Public Health Service. Applicants must hold an appropriate clinical degree (MD, DO, DVM, NP, RN, PA) or its equivalent from a recognized institution and satisfy the requirements of the school for admission to an MPH program. This program is open to students in the Tulane University School of Medicine as a combined MD/MPH&TM degree.

The degree requires 36 or 45 credits of course work. Thirty-six hours of course work normally can be completed in one year. Students who choose the expanded MPH&TM curriculum in order to pursue greater depth of training and experience in a given area of interest typically complete 45 credits in 18 months. For instance, students interested in malaria control may elect additional courses such as medical entomology, malaria, parasitologic methods, and practical experience with the New Orleans Mosquito Control Board, a model vector control program with close ties to the school.

The practice experience requirement for the MPH&TM degree program is waived for medical students and physicians because of their clinical experience.

The Capstone experience for students in the MPH&TM program (the Capstone seminar course), focuses on the development of a plan of action or proposal to address an issue in tropical medicine. This will be done in groups of two to four students, and presented to other students and faculty in the latter part of the student's final semester. Other capstone options may be arranged with faculty approval.

Requirements

Core Requirements (12-13 credits)

BIOS 603*	Introductory Biostatistics	3
EPID 603*	Epidemiologic Methods I	3

One of the following:

ENHS 601	Issues in Environmental Health Science	2
ENHS603	Survey of Environmental Health	3
ENHS 604	Environmental Health for Developing Countries	3
ENHS 654	Occupational Health	2

One of the following:

HSMG 603	Principles of Health Systems Administration and Management	2
HSMG 604	Comparative Health Systems	3
HSMG 609	Program Management in Developing Countries	3
ENHS 605	Influence of Human Ecosystem on Population Behavior and the Practice of Public Health	3
CHSC 603	Health Behavior and Risk Reduction	2
HSMG 635	Organizational Behavior in Health Care	3
INHL 621	International and Comparative Aspects of Health and Behavior	2

**If a student has training or experience in biostatistics and/or epidemiology, these courses may be waived with permission of the Departments of Biostatistics or Epidemiology.*

Specialty Requirements (17 credits)

TRMD 605	Medical Helminthology	3
TRMD 607	Medical Protozoology	3
TRMD 631	Clinical Tropical Medicine	2
TRMD 632	Preventive Tropical Medicine	2
OR		
TRMD 635	Disease Control in Developing Countries	2
TRMD 633	Microbial Diseases of the Tropics	2
TRMD 634	Diagnostic Methods in Microbiology	1
TRMD 636	Clinical Tropical Medicine Case Presentations	1
TRMD 700	Tropical Medicine Seminar (two semesters)	1+1
TRMD 703*	Capstone Seminar	1

Suggested Electives

TRMD 606	Medical Entomology	3
TRMD 617	Immunology	3
TRMD 623	Methods in Cell Biology	3
TRMD 642	Tropical Virology	3
TRMD 708	Parasitologic Methods	2
TRMD 718	Immunoparasitology	2
TRMD 782	Malaria	2
BIOS 620	Microcomputer Applications in the Health Sciences	2
BIOS 708	Design of Experiments	3
EPID 611	Epidemiology of Sexually Transmitted Diseases	2
EPID 626	Survey Methodology	3
INHL 604	Health and Economic Development	3

**Courses may be waived if another approved Capstone is done.*

Diploma Course in Clinical Tropical Medicine and Traveler's Health

The training program in Clinical Tropical Medicine and Traveler's Health ("Diploma Course") is designed to provide a comprehensive educational experience for physicians and other health professionals seeking certification in Tropical Medicine and Traveler's Health through the American Society of Tropical Medicine and Hygiene (ASTM&H). The purpose of this program is to provide a structured curriculum with practical instruction in tropical medicine, including the pathophysiology, clinical features, diagnosis, treatment, and control of diseases prevalent in the tropics. All of the courses required for this program are also required for students in the master of public health and tropical medicine (MPH&TM) program.

By offering this program in the Fall semester, the Tulane Diploma Course has been able to take advantage of faculty and courses that were already established for the MPH&TM and MSPH programs. This strategy has also led to the development of new courses, developed exclusively for Diploma Course students, and to modification of the MPH&TM and MSPH programs. Applicants should hold the degree of doctor of medicine, doctor of osteopathic medicine, or its equivalent from a recognized institution. Applications from other qualified health professionals, such as registered nurses and physician's assistants, will be considered on a case-by-case basis. Like the MPH&TM program, the Diploma Course is open to students in the Tulane University School of Medicine.

The program requires the equivalent of a minimum of 15 credits of coursework, which can be completed in a single Fall semester. Because the Diploma Course does not award a master's degree in public health, there is no requirement for core courses, practice experience, or a Capstone experience. However, students may arrange to apply credit hours from the Diploma Course toward a MPH&TM degree or another MPH degree. (Students must then complete the remaining requirements for the MPH or MPH&TM in order to receive those degrees.) Courses leading to the Diploma in Clinical Tropical Medicine and Traveler's Health are not offered in the Spring or Summer semesters.

Equivalent Program Requirements

TRMD 605	Medical Helminthology	3
TRMD 607	Medical Protozoology	3
TRMD 631	Clinical Tropical Medicine	2
TRMD 633	Microbial Diseases of the Tropics	2

TRMD 634	Diagnostic Laboratory Methods in Microbiology	1
TRMD 635	Disease Control in Developing Countries	2
TRMD 636	Clinical Tropical Medicine Case Presentations	1
TRMD 700	Tropical Medicine Seminar	1
AND		
Optional participation at affiliated clinics, including TB Clinic, Sexually Transmitted Diseases Clinic, and the Tulane Traveler's Clinic.		

Master of Science in Public Health (MSPH)

This program is designed for individuals who are or who plan to become professional health workers, and who wish to acquire advanced training in parasitology. Graduates will have the necessary training to participate in the design, planning, coordination, and execution of laboratory and field investigations. Further, graduates will be qualified to assist in public education programs about the causes, prevention and control of parasitic disease. As described in the MPH&TM program, students may select courses related to malaria or other vector-borne diseases and their control. Graduates of the MSPH degree program will be able to:

- Assist in planning and carrying out field research projects on tropical diseases in endemic areas
- Assist in planning, implementing, and monitoring programs for the control of tropical diseases in endemic areas
- Instruct inhabitants of areas endemic for tropical diseases about the different infectious agents present in the community, how those infections are acquired, and relevant personal preventive measures, and community-wide control strategies
- Detect and identify parasites in clinical specimens
- Instruct technicians and technologists in the methods used and the skills required to detect and identify parasites, and to diagnose other important tropical infections in clinical specimens
- Supervise an infectious disease diagnostic laboratory in a hospital, clinic or local, regional or national governmental health agency.

Operational skills that will be acquired include the ability to perform laboratory procedures for the diagnosis of parasitic and other tropical infections, epidemiologic and demographic studies for the prevention and control of parasitic diseases and the critical analysis of information related to parasitic infections, techniques employed in experimental research and basic statistical treatment of data.

Many students who enter the MSPH program in parasitology do so with the intention of working toward

an advanced degree at a later time. This program provides a sound background for students who would like to work for advanced degrees in parasitology or other public health-related programs in the infectious diseases.

The degree requires a minimum of 36 credits of coursework. Because of scheduling and sequencing of courses, entry in the Fall semester is strongly encouraged. The practice experience for the MSPH degree program will be waived for students with previous clinical/health experience. Students without previous practical experience must complete one of the following practice experiences:

- A laboratory-based research project on a topic chosen by the student, carried out by the student under the direction of a faculty member, and evaluated by the faculty member. This must include a written report of the results.
- A field placement under the supervision of a health professional. This placement may be with a health agency, a clinical laboratory, or an individual health professional working on a project related to parasitology in the United States or abroad. The student will be evaluated on his/her work and on a written report describing that field experience.

Students enrolled in the MSPH degree program may choose one of the following Capstone options:

- A written report or thesis on a laboratory-based research project, or a field-based project or placement.
- A comprehensive examination.
- A practicum (300 contact hours).

Core Requirements (12-15 credits)

TRMD 601*	Biological Mechanisms of Human Disease	2
OR		
ENHS 602*	Introduction to Human Health and Disease	2
OR		
ENHS 629*	Human Homeostasis and Environmental Insult	2
<i>*Above courses waived for those with strong biological backgrounds</i>		
BIOS 603	Introductory Biostatistics	3
EPID 603	Epidemiologic Methods I	3
ENHS 601	Issues in Environmental Health	2
OR		
ENHS 603	Survey of Environmental Health	3
OR		
ENHS 604	Environmental Health for Developing Countries	3
OR		
ENHS 654	Occupational Health	2

HSMG 603	Principles of Health Systems Administration and Management	2
OR		
HSMG 615	Complementary and Alternative Medicine	2
OR		
ENHS 605	Influence of the Human Ecosystem on Population Behavior and the Practice of Public Health	3
CHSC 603	Health Behavior and Risk Reduction	2
OR		
HSMG 635	Organizational Behavior in Health Care	3
OR		
INHL 621	International and Comparative Aspects of Health and Behavior	2

Specialty Requirements (15 credits)

TRMD 605	Medical Helminthology	3
TRMD 606	Medical Entomology	3
TRMD 607	Medical Protozoology	3
TRMD 617	Immunology	3
TRMD 702	Parasitology Seminar (each semester)	1+1
TRMD 708	Parasitologic Methods	2

Recommended Electives

BIOS 604	Intermediate Biostatistics	3
BIOS 620	Microcomputer Applications in the Health Sciences	2
BIOS 708	Design of Experiments	3
EPID 609	Introduction to Infectious Diseases	2
TRMD 623	Methods in Cell Biology	3
TRMD 642	Tropical Virology	3
TRMD 708	Parasitologic Methods	2
TRMD 718	Immunoparasitology	2
TRMD 782	Malaria	2

Doctor of Science (ScD) in Parasitology

This program is designed for the individual whose career is oriented to the diagnostic or research laboratory, or to field studies in tropical disease. Graduates of the ScD degree program will be able to:

- Plan and carry out field research projects on various aspects of tropical diseases in the community.
- Plan, implement, and monitor programs for the control of tropical diseases in endemic areas.
- Analyze the results of their own research, as well as the research of others as reported in the literature.
- Direct an infectious disease diagnostic laboratory in a hospital, clinic or local, regional or national governmental health agency.
- Train laboratory personnel in the detection and identification of parasites in clinical specimens, the diagnosis of other tropical infectious diseases and the methodology employed.
- Train field workers in the techniques used for research projects and control programs.

Students seeking admission to the program should have an MSPH degree or equivalent and two years of training and/or experience in a field related to parasitology (other than the time spent in a degree program). A personal interview is required if the applicant is located in or near New Orleans.

Graduates are qualified to work as laboratory directors of control, training or research programs in parasitic and other tropical infectious diseases.

Completion of the degree requires a minimum of two years and normally three or more years of course work and dissertation research. Students will have satisfied core requirements for the MSPH degree, and the specialty requirements.

Both the practice and Capstone experiences will be fulfilled by the laboratory/field work and thesis requirements for the ScD degree program.

Additional Specialty Requirements (23 credits)

TRMD 702	Parasitology Seminar (each semester)	1
TRMD 718	Immunoparasitology	2
TRMD 782	Malaria	2
TRMD 799	Independent Study (minimum)	3
BIOS*	BIOS 604 or 708, 715	6
EPID605	Development of Protocols for Problem Solving	3
TOTAL		25

**Minimum of six credits in advanced biostatistics and 2 credits in advanced computer applications*

Suggested Electives*

TRMD 632	Preventive Tropical Medicine	2
TRMD 642	Tropical Virology	3
BIOS 622	Database Management in the Health Sciences	3
EPID 709	Introduction to Infectious Diseases	3
EPID 626	Survey Methodology	3
ENHS 603	Survey of Environmental Health	3
ENHS 651	Water Quality Management	3
HSMG 601	History and Organization of Health Service	2
HSMG 605	Health Systems Concepts	3
INHL 604	Health and Economic Development	3
INHL 605	Principles for Policies and Programs in Population, Health, and Nutrition in Developing Countries	2

**Total elective credits: sufficient to fulfill requirements for the degree.*

Faculty & Research Topics

John S. Beier, ScD

- Mosquito malaria parasite relationships that affect the transmission potential of anopheline mosquitoes
- Epidemiologic/ecologic field studies of malaria vectors and malaria parasite transmission
- Novel transmission blocking approaches for malaria control

Paul J. Brindley, PhD

Proteolytic enzymes of helminth parasites
 Molecular basis of host specificity of schistosomes and hookworms
 The schistosome genome, including its resident mobile genetic elements

Sharon Isern, PhD

Viral vector development
 Transgenesis of medically important parasites
 Molecular basis of virus and invertebrate host interactions

Mark A. James, PhD

Immunity and immunopathogenesis in parasitic infections
 Cytokine responses to malaria
 Use of synthetic malaria peptides for diagnosis and epidemiological surveillance

Donald J. Krogstad, MD

Molecular and genetic basis of resistance to chloroquine and quinine
 Techniques for the characterization of individual clones of malaria parasites
 Development of methods to study pathogenicity (parasite virulence)

Susan L.F. McLellan, MD, MPH

Development of digitized images for clinical and laboratory courses
 Travel and Tropical Medicine Clinic at Tulane University Hospital and Clinic
 GeoSentinel Project - surveillance for diseases in travelers

Scott F. Michael, PhD

Molecular epidemiology of viruses
 Cross-species transmission and origin of human viruses
 Molecular biology of virus replication

Richard A. Oberhelman, MD

Causes of diarrhea in daycare centers in both New Orleans and Mexico
 Impact of intestinal parasite infections on growth and development in rural pediatric populations
 Public health and probiotic strategies for control of pediatric diarrhea in developing countries
 Pediatric tuberculosis in developing countries

Latha Rajan, MD, MPH&TM

Distance learning
 Molecular diagnostic for sexually transmitted diseases
 HIV epidemiology

Margarita A. Sileo, MD, MPH&TM

National pediatric aids clinical trials group (PACTG) investigator
 Therapeutic drug trials
 Meningococcal conjugate vaccine clinical trials

Dawn M. Wesson, PhD

Ecology of arbovirus transmission
 Host-pathogen coevolution

Mark F. Wiser, PhD

Molecular and cellular biology of protozoan parasites and their interactions with host cells
 Host-parasite interactions