

Graduate Student Handbook

Tropical Medicine Graduate Program
Revised July, 2011

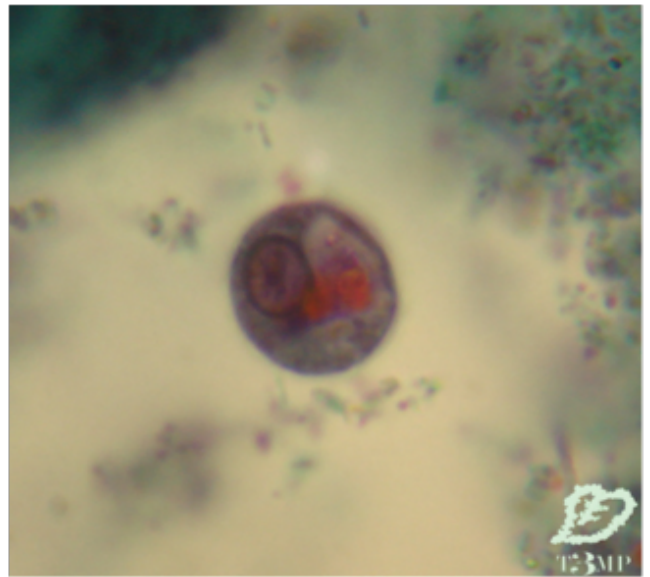


Department of Tropical Medicine, Medical Microbiology & Pharmacology
John A. Burns School of Medicine • University of Hawai'i at Manoa

651 Ilalo Street, BSB 320
Honolulu, HI 96813
Phone (808) 692 - 1617
Fax (808) 692 - 1979



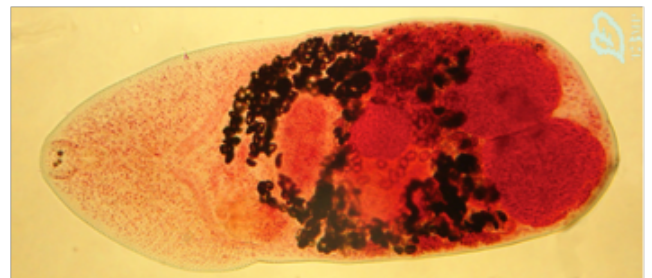
Angiostrongylus cantonensis, male larvae



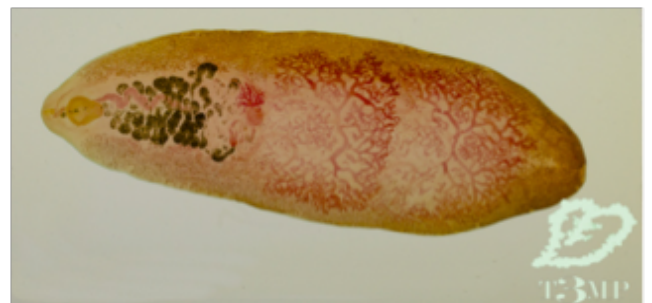
Entamoeba histolytica trophozoite



Clonorchis ovum



Metagonimus yokogawa, adult fluke



Fasciolopsis, adult fluke



Trichuris ovum



Clonorchis, adult fluke

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Introduction

This handbook sets forth the basic policies, requirements and procedures for graduate students pursuing degrees in Tropical Medicine. You should read this very carefully so that you are clear about your responsibilities as a student and the responsibilities of the program to you. If you have any questions about any of the information presented herein, please contact the graduate chair, Dr. Sandra Chang (email: sandrac@hawaii.edu /ph: 808. 692.1607). The earlier you clarify any matter of concern to you, the less likely it will create any problems for you later. We wish you great success in pursuing your educational goals and hope that this handbook provides you with a good tool in meeting those goals.



Tropical Medicine graduate students, Fall 2010: kneeling: Wen-Yang Tsai, Winifrida Kidima, Panpim Thongsripong, Esther Volper, Amanda Pires, Chih-Yun Lai, Yeung Tutterrow ; standing: Mukesh Kumar, Argon Steel, James Kelley, Shogo John Miyagi, Rebecca Kanenaka, Kelsey Roe, Anna Babakhanyan, Sody Munsaka, Madhuri Namekar, Kae Pusic.

Program Overview

Tropical Medicine is the study of infectious diseases that occur more commonly in tropical regions of the world. However, in today's era of globalization and modern transportation, diseases that were once confined to the tropics have spread geographically and now play a significant role in the 20th century global resurgence of infectious diseases. As such, research in the area of Tropical Medicine has greatly increased in importance in the past 20 years.

The Department of Tropical Medicine and Medical Microbiology at the John A. Burns School of Medicine was founded in 1972. In 2004, it merged with the Department of Pharmacology to become the Department of Tropical Medicine, Medical Microbiology and Pharmacology. The department offers graduate programs leading to the MS and PhD degrees in Biomedical Sciences (Tropical Medicine). A major goal of the Tropical Medicine graduate program is to provide Hawaii and its neighboring Asian and Pacific nations with the expertise needed to conduct tropical infectious diseases research. Tropical Medicine faculty performs studies on dengue, West Nile, HIV/AIDS, hepatitis, viral and bacterial encephalitis, malaria, and Kawasaki disease. A multidisciplinary approach is taken which encompasses the fields of immunology, microbial pathogenesis, epidemiology, pharmacology, laboratory diagnostics, socio-ecological systems, and human, microbial and vector ecology. Pharmacology faculty research includes pharmacokinetics, pharmacodynamics, molecular studies of drug metabolism, and reproductive pharmacology. Certain research projects seek to answer fundamental questions associated with the transmission dynamics and pathogenesis of these diseases while others encompass translational studies to improve approaches for tropical disease diagnosis, treatment, and prevention. These studies can be laboratory-based, field-based, clinic-based, or include a combination of all three.

The field of Tropical Medicine requires knowledge of virology, bacteriology, parasitology, entomology, immunology, cell and molecular biology, epidemiology, ecology, bioinformatics, behavioral science and clinical medicine. In this respect, the Tropical Medicine program at UHM provides learning opportunities in a range of disciplines available in few other university departments. The department participates in joint research projects with several community hospitals and collaborates closely with the State of Hawai'i Department of Health, providing instruction and expertise in bioterrorism preparedness and infectious disease diagnosis using the latest technologies. In addition to local collaborations, department faculty have partnered with several international institutions in the Pacific, Southeast Asia and Africa to conduct field research in infectious diseases.

Faculty

Regular Graduate Faculty

V. R. Nerurkar, PhD (Department Chair) – pathogenesis of infectious diseases, delineating cellular and molecular mechanisms underlying microbe-host interaction

J. Barbour, PhD – HIV immunology

S. N. Bennett, PhD – molecular evolution and epidemiology of emerging infectious diseases

S. P. Chang, PhD (Graduate Program Chair) – immunology, molecular biology, malaria vaccine development, malaria metabolomics

M.L. Chapagain, PhD – pathogenesis of viral encephalitis, microbe: host interactions

A. Collier, PhD – pharmacology, pharmacokinetics, reproductive pharmacology

A. R. Diwan, PhD – medical virology, chemotherapy, vaccines (emeritus)

E. Furusawa, MD, PhD – viral chemotherapy (emeritus)

W. L. Gosnell, PhD – host parasite interactions, malaria, immunology

G. S. N. Hui, PhD – parasitology, immunology, cell biology

P. H. Kaufusi, PhD - pathogenesis of West Nile virus

K. J. Kramer, PhD – parasitology, epidemiology, leptospirosis, HIV serodiagnosis

F. D. Miller, PhD – epidemiology of infectious diseases

L. Ndhlovu, MD, PhD – HIV immunology

D. W. Taylor, Ph.D. – malaria immunology, maternal and child health

S. Verma, PhD – molecular pathogenesis of flavivirus infections, including West Nile virus

W-K. Wang, MD, ScD – immunology and pathogenesis of dengue virus infections

K. Yamaga, PhD – immunological mechanisms of diseases (emeritus)

Cooperating Graduate Faculty

J. M. Berestecky, PhD – enteric bacteria

L. Chang, MD – application of advanced neuroimaging techniques to study brain changes associated with HIV, substance abuse, brain development and aging

G. Erdem, MD – molecular epidemiology of group A streptococcal and staphylococcal infections; complications of strep infections like acute rheumatic fever

Y. Lu, PhD – gene therapy for HIV-1 infection, aquaculture virology

M. E. Melish, MD – staphylococcal infection and toxins, clinical infectious disease, Kawasaki syndrome

B. Shiramizu, MD – pathobiology of HIV-associated disorders

E. K. Tam, MD – inflammation, immunologic mechanisms of pulmonary diseases, genetic and environmental determinants of asthma

R. Yanagihara, MD – emerging and re-emerging infectious diseases

Affiliate Graduate Faculty

F. Mercier, PhD – neurovirology

C. F. T. Uyehara, PhD – developmental and cardiovascular pharmacology

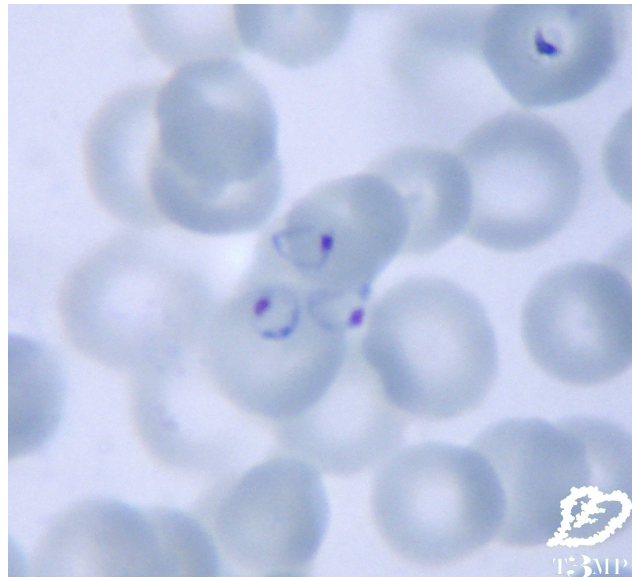
Administrative Staff

Sheila Kawamoto, Administrative & Fiscal Support Specialist

Cori Watanabe, Junior Specialist

Becky Nakama, Institutional Support

Justin Forsythe, Institutional Support



MS and PhD Program Requirements

Master's Plan A (Thesis)

- Preliminary conference with graduate program chair
- Appointment of interim advisor
- Pre-Candidacy Progress (Form I) (complete relevant sections)
 - Preliminary conference with interim academic adviser
 - Identification and remediation plan for deficiencies (if applicable)

Diagnostic Evaluation

- First or early in the second semester of residence
- Open book, short essay exam to evaluate background in infectious disease microbiology & immunology
- Used to advise the student on course of study and areas needing improvement

General (Qualifying) Examination

- Second semester of residence
- General exam (closed book, short essay answers with oral followup) with questions composed by TRMD faculty
- Evaluates student's knowledge base of Tropical Medicine core course content (general medical microbiology, virology, bacteriology, parasitology, immunology, and bioinformatics)
 - Students must pass all sections of the exam
- Used to evaluate student progress and advise on course of study to correct weaknesses

Pass:

- advancement to candidacy for MS degree
- a student whose exam and overall academic performance has been exceptional may be recommended for continuation to the PhD program upon completion of the MS degree or for transfer to the PhD program

Fail:

- Failed sections or the entire exam may be repeated once within 6 months of the date of the first exam
- A student who fails the general examination a second time will be dismissed from the program
- Pre-Candidacy Progress (Form I) (complete relevant section and submit to Graduate Division)
 - Successful completion of qualifying examination

Coursework requirements

- (see section on Tropical Medicine Curriculum for course details)
- 30 credit hours (must be taken for an A-F letter grade)
- 18 hrs approved course work including TRMD core courses and excluding 699 and thesis 700
- Minimum 12 hrs in courses numbered 600-798
- registration in thesis 700 during last semester; at least 9 cr. hrs of 699/700

Master's Thesis Committee

- Selection of permanent advisor by end of first year (chair of thesis committee)
- Preparation of individualized timeline for MS Plan A degree (see sample on p. 40)
- Appointment of two other members of TRMD graduate faculty to committee
 - <http://www.hawaii.edu/graduate/wa/selectmember.php>

Master's Plan A (Thesis) cont'd

Advance to Candidacy

-Submission of thesis topic and proposal to thesis committee for their review and approval

Format of written thesis proposal to be specified by thesis committee but should consist of sections on background and significance, specific aims, research design and methods, and preliminary studies.

Thesis proposal should be presented as a departmental seminar

Should be completed by the end of the third semester

-Obtain certification, approvals and guidance as needed:

Committee on Human Studies

www.hawaii.edu/irb/; 539-3955

Environmental Health & Safety Office

www.hawaii.edu/ehso/; 956-8660

Institutional Animal Care and Use Committee

www.hawaii.edu/ansc/IACUC/; 956-4446

-Submission of Advance to Candidacy Form II to Graduate Division

Committee approval of thesis proposal

Submission of all required approval documents

Form II must be submitted prior to registering for Thesis 700

Final Examination

-Research seminar and oral examination covering thesis research and related areas
Conducted by thesis committee; seminar open to all graduate faculty, students and general public

-To be held at least three weeks before the end of the term during which the degree is conferred

-A student failing the final examination may repeat it once at the discretion of the thesis committee.

-A student who fails the examination a second time will be dismissed from the program.

-Thesis Evaluation (Form III)

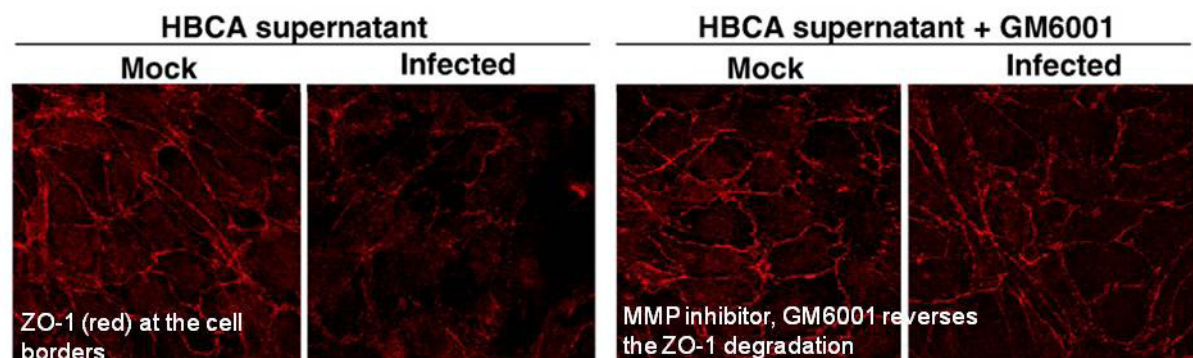
Certification of final oral exam and thesis defense by thesis committee

-Thesis Submission (Form IV)

Approval of the written thesis by thesis committee

Replaces signature page of thesis document

Matrix metalloproteinases derived from WNV-infected human astrocytes (HBCA) degrades ZO-1 of vascular endothelial cells *in vitro*



Master's Plan B (Non-Thesis)

Tropical Medicine MS students are admitted into the MS Plan A program; conversion to MS Plan B may only be made in unusual circumstances and requires program approval

Preliminary conference with graduate program chair

- Appointment of interim advisor
- Pre-Candidacy Progress (Form I) (complete relevant sections)
 - Preliminary conference with interim academic adviser
 - Identification and remediation plan for deficiencies (if applicable)

Diagnostic Evaluation

- First or second semester of residence
- Open book, short essay exam to evaluate background in infectious disease microbiology & immunology
- Used to advise the student on course of study and areas needing improvement

General (Qualifying) Examination

- Second semester of residence
 - General exam (closed book, short essay answers with oral followup) with questions composed by TRMD faculty
 - Evaluates student's knowledge base of Tropical Medicine core course content (general medical microbiology, virology, bacteriology, parasitology, immunology, and bioinformatics)
- Used to evaluate student progress and advise on course of study to correct weaknesses

Pass:

- Advancement to candidacy for MS degree
- A student whose exam and overall academic performance has been exceptional maybe recommended for continuation to the PhD program upon completion of the MS degree or for transfer to the PhD program

Fail:

- Failed sections or the entire exam may be repeated once within 6 months of the date of the first exam
- A student who fails the general examination a second time will be dismissed from the program

Pre-Candidacy Progress (Form I) (complete relevant section and submit to Graduate Division)

- Successful completion of qualifying examination

Coursework requirements

(see section on Tropical Medicine Curriculum for course details)

- 30 credit hours (must be taken for an A-F letter grade)
- 18 hrs approved course work including TRMD core courses and excluding 699 and thesis 700
- Minimum 12 hrs in courses numbered 600-798
- registration in thesis 700 during last semester; at least 9 cr. hrs of 699/700

Master's Plan B Committee

- Permanent adviser; selected by end of the first year
- Two other members of TRMD faculty
 - (refer to <http://www.hawaii.edu/graduate/wa/selectmember.php>)
- Preparation of individualized timeline for MS Plan B degree (see sample on p. 40)

Master's Plan B (Non-Thesis) cont'd

Study Program and Research Project proposal

- Meet with committee to decide on study program before end of second semester
 - Additional courses
 - Research project proposal
- Obtain certification, approvals and guidance as needed:
 - Committee on Human Studies
 - www.hawaii.edu/irb/; 539-3955
 - Environmental Health & Safety Office
 - www.hawaii.edu/ehso/; 956-8660
 - Institutional Animal Care and Use Committee
 - www.hawaii.edu/ansc/IACUC/; 956-4446
- Completion and internal filing of modified Advance to Candidacy Form II

Final examination

- Comprehensive written and oral examination; demonstrate basic knowledge of the various fields encompassed by Tropical Medicine
 - To be conducted by candidate's advisory committee
 - To be given at least three weeks before the end of the term in which the degree is conferred
- Presentation of research seminar and written paper covering research project
- Completion and internal filing of modified Progress Report Form III
 - Certification of completion of research seminar and written paper

Doctor of Philosophy

Preliminary conference with graduate program chair

- Appointment of interim advisor
- Pre-Candidacy Progress (Form I) (complete relevant sections)
- Preliminary conference with interim academic adviser
- Identification and remediation plan for deficiencies (if applicable)

Diagnostic Evaluation

- First or second semester of residence
- Open book, short essay exam to evaluate background in infectious disease microbiology & immunology
- Used to advise the student on course of study and areas needing improvement

Doctor of Philosophy cont'd

General (Qualifying) Examination

- Second semester of residence
- General exam (closed book, short essay answers with oral follow-up) with questions composed by TRMD faculty
- Evaluates student's knowledge base of Tropical Medicine core course content in general medical microbiology, virology, bacteriology, parasitology, immunology, and bioinformatics.
- *See Curriculum page 14 for list of core courses*
- Used to evaluate student progress and advise on course of study to correct weaknesses

Pass:

Advancement to candidacy for PhD degree

Marginal Pass:

A student whose examination and overall academic performance are inadequate to recommend for PhD candidacy may, at the discretion of the examination committee, be recommended to convert to a terminal Master's degree program

Fail:

Failed sections or the entire exam may be repeated once within 6 months of the date of the first exam

A student who fails the general examination a second time will be dismissed from the program

Pre-Candidacy Progress (Form I) (complete relevant section and submit to Graduate Division)

Successful completion of qualifying examination

Coursework requirements

All PhD candidates, other than graduates of the TRMD MS program, are required to enroll in the TRMD core curriculum in order to prepare for the General (Qualifying) Examination. Additional courses which, based on the recommendations of their adviser and dissertation committee, are essential to prepare them for a research career in their area of specialization

Teaching experience

Candidates should gain teaching experience by serving as a teaching assistant in a graduate or undergraduate course, or in the medical education curriculum

PhD Dissertation Committee

- Selection of permanent advisor by end of first year (chair of dissertation committee)
- Preparation of individual timeline for PhD degree (see sample on p.41)
- Appointment of at least two other members of TRMD graduate faculty to committee
- Appointment of one outside member to committee
- Appointment of remaining committee members from TRMD or other UH graduate faculty;
- Although allowable, committees larger than five members are discouraged

For eligible committee member see:

<http://www.hawaii.edu/graduate/wa/selectmember.php>

Doctor of Philosophy cont'd Advance to Candidacy

-Submission of dissertation topic and proposal to thesis committee for their review and approval

Format of written thesis proposal may be similar to the document prepared for the comprehensive examination but should specify the actual scope of the dissertation research project

Dissertation proposal should be presented as a departmental seminar

Should be completed by the end of the third semester

-Obtain certification, approvals and guidance as needed:

Committee on Human Studies

www.hawaii.edu/irb/; 539-3955

Environmental Health & Safety Office

www.hawaii.edu/ehso/; 956-8660

Institutional Animal Care and Use Committee

www.hawaii.edu/ansc/IACUC/; 956-4446

-Advance to Candidacy (Form II)

Appointment of dissertation committee

Committee approval of research topic and proposal

Results of the comprehensive exam

Submission of all required approval documents

Form II must be submitted to Graduate Division prior to registering for Dissertation 800

Final Examination and Dissertation Defense

-Administered by the dissertation committee upon completion of the dissertation research in the form of a seminar presentation, defense and oral examination

-Committee evaluation is based on the following criteria:

Student's proficiency in the area of specialization within the field of Tropical Medicine as commensurate with the expectations of the PhD degree

Production of a body of work which is on par with program expectations for the specific degree

The ability of the student to effectively communicate and defend this body of work

-A majority of the committee must vote to pass the student in order for student to pass the exam.

-The exam may be repeated once.

-Failure to pass the final examination after two attempts will result in dismissal from the graduate program.

-Complete at least 6 wks before end of semester in which degree granted

Dissertation Evaluation (Form III)

-Signed by doctoral committee members who participate in final defense, including proxies

Approval of dissertation document and student's defense

-Submit no later than 3 wks prior to dissertation due date

Dissertation Submission (Form IV)

-Replaces signature page of dissertation

Approval of the content and form of the final dissertation document

-Signed by dissertation committee chair and majority of committee, including committee member(s) who may have been absent at the defense

-Due date specified in the Academic Calendar

Academic Policies

Undergraduate and graduate students in the School of Medicine must adhere to the academic policies of UH Manoa. A summary description of these policies may be found in the online catalog:

<http://www.catalog.hawaii.edu/about-uh/campus-policies/campus-policies.htm>

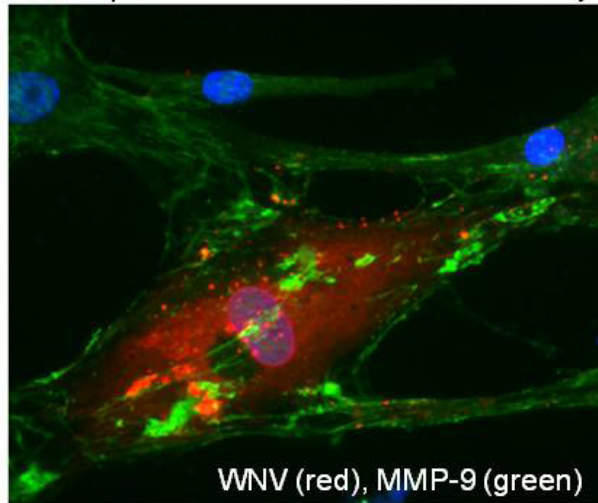
UH Mānoa Student Conduct Code

<http://www.hawaii.edu/student/conduct/>

Graduate Academic Grievance Procedures

<http://www.hawaii.edu/graduate/policies/html/grievance.htm>

WNV infection induces matrix metalloproteinase-9 in human astrocytes



Curriculum

Prerequisites: All students are required to have a background of undergraduate courses in medical microbiology, molecular and cell biology, organic chemistry and biochemistry, physics, and mathematics. An introductory course in immunology (e.g. MICR 461) is highly recommended.

The required and/or recommended courses for Tropical Medicine MS and PhD programs are divided into three groups:

Group I - Tropical Medicine Core Courses

The core curriculum for both MS and PhD students is as follows:

Semester	Course Title	Credit Hrs
<i>Fall Semester Yr 1:</i>		
TRMD 603	Infectious Disease Microbiology I: Parasitology	3
TRMD 604	Concepts in Immunology and Immunopathogenesis	2
TRMD 653	Bioinformatics for Infectious Disease	2
<i>Spring Semester Yr 1:</i>		
TRMD 605	Infectious Disease Microbiology II: Virology	3
TRMD 608	Infectious Disease Microbiology III: Bacteriology & Mycology	3
<i>Fall or Spring Semester Yr 1:</i>		
TRMD 606	Tropical Medicine Laboratory Rotation	var
<i>Fall or Spring Semester, Yr 1 or 2:</i>		
CMB 626 or MICR 614	Research Ethics	1-2
<i>Fall and Spring Semesters each yr:</i>		
TRMD 690	*Seminar in Tropical Medicine & Public Health	1
<i>Fall or Spring Semesters each yr:</i>		
TRMD 601	Directed Reading (Journal Club)	1

* Student must enroll for a grade (A-F) and make a presentation once per academic year (as well as attend all seminars). Student may enroll for Cr/NCr during the other semester of that academic year.

Group II - Tropical Medicine Elective Courses

To be selected by the student and his/her graduate committee according to the student's interests and needs.

TRMD 607	Neurovirology
TRMD 609	Advances in Medical Immunology
TRMD 610	Infection and Immunity
TRMD 650	Ecological Epidemiology
TRMD 652	Advanced Genetics & Evolution of Infectious Diseases
TRMD 653	Bioinformatics and Molecular Evolution
TRMD 671	Advanced Medical Parasitology
TRMD 672	Advanced Medical Virology
TRMD 673	Advanced Medical Bacteriology
TRMD 695	Plan B Master's Project
TRMD 699	Directed Reading/Research
TRMD 700	Thesis Research
TRMD 705	Special Topics in Tropical Medicine
TRMD 800	Dissertation Research

Group III - Elective Courses in Related Fields

Asian Studies (ASAN)	
600	Asian Studies Seminar
Biochemistry (BIOC)	
441	Basic Biochemistry
644	Metabolic Biochemistry
Cell & Molecular Biology (CMB)	
606	Introduction to Neurosciences
621	Cell Molecular Biology I
622	Cell Molecular Biology II
625	Advanced Topics in Genetics
640	Neuropharmacology
650	Population Genetics
654	Genetics Seminar
671	Techniques in Genetics
705	Special Topics in Neurosciences
Geography (GEOG)	
410	Human Role in Environmental Change
411	Paleoenvironmental Change
388	Introduction to GIS
489	Applied Geographic Information Systems
654	Seminar in Geography of S.E. Asia
665	Seminar in Geography of the Pacific

Group III - Elective Courses in Related Fields cont'd

Interdisciplinary Studies (IS)

650	Principles of Applied Evolutionary Ecology
651L	Laboratory in Applied Evolutionary Ecology
652L	Laboratory in Applied Evolutionary Ecology

Microbiology (MICR)

461	Immunology
463	Microbiology of Pathogens
470	Microbial Pathogenesis
490	Virology
601	Molecular Cell Biology
625	Advanced Immunology
630	Microbial Genome
632	Advanced Microbial Physiology
680	Advances in Microbial Ecology
681	Host-Parasite Relationships
685	Molecular and Cellular Bacterial Pathogenesis

Molecular Biosciences & Bioengineering (MBBE)

601	Molecular Cell Biology
621	Metabolic Engineering
625	Biosensor Principles and Applications
650	DNA and Genetic Analysis
651	Signal Transduction and Regulation of Gene Transcription
683	Advanced Bioinformatics Topics for Biologists
687	Advanced Lab Techniques

Pharmacology (PHRM)

601	General Pharmacology
602	Systematic Pharmacology
604	Neuropharmacology

Plant & Environmental Protection Sciences (PEPS)

486	Insect-Microbe Interactions
641	Insect Physiology
661	Medical and Veterinary Entomology
662	Systematics and Phylogenetics
671	Insect Ecology
675	Biological Control of Pests
686	Insect Transmission of Plant Pathogens

Group III - Elective Courses in Related Fields cont'd

Public Health Sciences (PH)

650	Ecological Epidemiology
652	Interdisciplinary Seminar
655	Biostatistics I
656	Biostatistics II
658	Computer Applications in Public Health
663	Principles of Epidemiology I
664	Principles of Epidemiology II
666	Seminar in Infectious Disease Control
669	Epidemiological Study Design Critique
690	Introduction to Global Health
692	Clinical Epidemiology
747	Statistical Methods in Epidemiological Research

Zoology (ZOOL)

487	Molecular Ecology
619	Seminar on Science Teaching
631	Biometry
632	Advanced Biometry
642	Cellular Neurophysiology
652	Population Biology
690	Conservation Biology

PhD Comprehensive Exam

The Tropical Medicine PhD Comprehensive Examination will consist of the preparation and defense of a research proposal based on the student's dissertation research project. This examination should be administered by the end of the second year of the student's PhD training. The exact format of the proposal is to be specified by the dissertation committee; however it should generally follow the format of a grant proposal to a major funding agency such as the National Institutes of Health or the National Science Foundation. The proposal should be prepared in consultation with the student's research advisor but should include at least one innovative objective that is not included as part of an existing grant or a proposal developed by the advisor. The student's written proposal will be submitted to the members of the student's dissertation committee and an oral examination based on the written proposal will be carried out by the committee. The content of this oral examination may include fundamental concepts underlying the hypotheses addressed in the proposal, technical or experimental design issues, and any other topics which the committee feels are pertinent to the student's understanding of his/her research area. A majority of the committee must vote to pass the student in order for student to pass the exam. The exam may be repeated once. Failure to pass the comprehensive exam after two attempts will result in dismissal from the graduate program. (see pages 11-12 for information)

Guidelines for preparation of the Comprehensive Exam Proposal:

The following guidelines are based on restructured application instructions for NIH R01 grant applications.

For more details and examples of successful R01 proposals, please refer to the following websites:

<http://grants.nih.gov/grants/funding/phs398/phs398.pdf>

Sample R01 applications:

<http://funding.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx>

Comprehensive Exam Proposal Guidelines

Project Summary and Relevance

-State the proposal's broad, long-term objectives and specific aims, making reference to the health relatedness of the project (i.e., relevance to the mission of the agency). Describe concisely the research design and methods for achieving the stated goals. This section should be informative to other persons working in the same or related fields and insofar as possible understandable to a scientifically or technically literate reader. Avoid describing past accomplishments and the use of the first person.

-The second component of the Description is Relevance. Using no more than two or three sentences, describe the relevance of this research to public health. In this section, be succinct and use plain language that can be understood by a general, lay audience.

Specific Aims

State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will field that the proposed project addresses.

Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will changed if the proposed aims are achieved.

Innovation

-Explain how the application challenges and seeks to shift current research or clinical practice paradigms.

-Describe any novel theoretical concepts, approaches or methodologies, instrumentation or intervention(s) to be developed or used, and any advantage over existing methodologies, instrumentation or interventions.

Approach

-Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed and interpreted.

-Preliminary Studies: Discuss the PD/PI's preliminary studies, data, and/or experience pertinent to this application. Preliminary data can be an essential part of a research grant application and help to establish the likelihood of success of the proposed project.

-Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.

-Describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

-Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised. A discussion on the use of Select Agents should be provided.

(If an applicant has multiple Specific Aims, then the applicant may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.)

Protection of Human Subjects

-Describe and justify the proposed involvement of human subjects, inclusion of women and minorities, and inclusion of children in the work outlined in the Research Strategy section.

-Describe the characteristics of the subject population, including their anticipated number, age range, and health status if relevant.

-Describe sources of material, potential risks to subjects (physical, psychological, financial, legal, or other), and protection against risks

-Describe and justify the sampling plan, as well as the recruitment and retention strategies, informed consent, and the criteria for inclusion or exclusion of any subpopulation.

-Explain the rationale for the involvement of special vulnerable populations, such as fetuses, neonates, pregnant women, children, prisoners, institutionalized individuals, or others who may be considered vulnerable populations. Note that 'prisoners' includes all subjects involuntarily incarcerated (for example, in detention centers) as well as subjects who become incarcerated after the study begins.

Vertebrate Animals

If vertebrate animals are involved in the project, address each of the five points below. This section should be a concise, complete description of the animals and proposed procedures.

- Provide a detailed description of the proposed use of the animals for the work outlined in the Research Strategy section. Identify the species, strains, ages, sex, and numbers of animals to be used in the proposed work.
- Justify the use of animals, the choice of species, and the numbers to be used. If animals are in short supply, costly, or to be used in large numbers, provide an additional rationale for their selection and numbers.
- Provide information on the veterinary care of the animals involved.
- Describe the procedures for ensuring that discomfort, distress, pain, and injury will be limited to that which is unavoidable in the conduct of scientifically sound research. Describe the use of analgesic, anesthetic, and tranquilizing drugs and/or comfortable restraining devices, where appropriate, to minimize discomfort, distress, pain, and injury.
- Describe any method of euthanasia to be used and the reason(s) for its selection. State whether this method is consistent with the recommendations of the American Veterinary Medical Association (AVMA) Guidelines on Euthanasia. If not, include a scientific justification for not following the recommendations.

Select Agent Research

If any of the activities proposed in the application involve the use of Select Agents at any time during the proposed project period, either at the applicant organization or at any other Project/Performance Site, address the following three points for each site at which Select Agent research will take place.

- Identify the Select Agent(s) to be used in the proposed research.
- Provide the registration status of all entities* where Select Agent(s) will be used.
If the Project/Performance Site(s) is a foreign institution, provide the name(s) of the country or countries where Select Agent research will be performed.

*An "entity" is defined in 42 CFR 73.1 as "any government agency (Federal, State, or local), academic institution, corporation, company, partnership, society, association, firm, sole proprietorship, or other legal entity."

- Provide a description of all facilities where the Select Agent(s) will be used.
Describe the procedures that will be used to monitor possession, use and transfer of the Select Agent(s).

Describe plans for appropriate biosafety, biocontainment, and security of the Select Agent(s).

Describe the biocontainment resources available at all performance sites.

Student Learning Outcomes

Master of Science in Biomedical Sciences (Tropical Medicine)

1. Demonstrate a fundamental knowledge base in the major subdisciplines of the field of Tropical Medicine: bacteriology, virology, mycology, parasitology, immunology, molecular epidemiology, and infectious disease ecology and bioinformatics.
2. Demonstrate a mastery of technical and experimental methodologies required to conduct research in the field of Tropical Medicine.
3. Demonstrate the ability to plan, execute, interpret, and evaluate experimental studies in Tropical Medicine.
4. Demonstrate skills required for instruction, assessment and mentoring of undergraduate and MS level students.
5. Demonstrate proficiency in written and verbal communication skills in classroom lectures and other teaching formats and in professional seminars and presentations.
6. Demonstrate sufficient mastery and scientific maturity to assess the work of peers in related fields.

Doctor of Philosophy in Biomedical Sciences (Tropical Medicine)

1. Demonstrate an advanced knowledge base in the major subdisciplines of the field of Tropical Medicine: bacteriology, virology, mycology, parasitology, immunology, molecular epidemiology, and infectious disease ecology and bioinformatics.
2. Demonstrate a mastery of technical and experimental methodologies required to conduct research in the field of Tropical Medicine.
3. Demonstrate the ability to plan, execute, interpret, and evaluate experimental studies in Tropical Medicine.
4. Demonstrate skills for instruction, assessment and mentoring of undergraduate, MS and PhD level students.
5. Demonstrate skills to verbally communicate scientific concepts and results in classroom lectures and other teaching formats and in professional seminars and presentations.
6. Demonstrate written communication skills as required in various professional duties including manuscript preparation for scientific publication, preparation of research grant applications, preparation of lecture notes, development of introductory and advanced courses in related disciplines.
7. Demonstrate sufficient mastery and scientific maturity to assess the work of peers in related fields.
8. Develop administrative skills to manage a research laboratory, supervise technical and professional staff, and assume responsibilities and provide leadership as a faculty member.

MS/PhD Curriculum Map									
		Intended Student Learning Outcomes*							
Course or Activity	1 Tropical Medicine Knowledge Base	2 Mastery of Research Methods	3 Experimental Design & Execution	4 Instructional and mentoring skills	5 Verbal communication skills	6 Written communication skills	7 Peer evaluation & assessment	8 Research laboratory administration skills	
TRMD 603, 604, 605, 608, 653	I, A*			I, R	R		R		
TRMD 606		I	I			I			
TRMD 607, 609, 650, 652, 671, 672, 673, 705	R, A	R, A	R	I	R				
TRMD 690	R	R	R	R	R, A	I	I		
TRMD 601 (Journal Club), 699 (Dir Reading)	R, M	R	R	R	R		R		
TRMD 699 (Dir Research)		R, M	R, M		R	R		I	
TRMD 700		R, A	R, A		R, A	R		R	
TRMD 800		M*, A	M, A		M, A	M		R	
Supervision of undergrad, grad students				R			R	I	

*I)=introduced; "R"=reinforced and opportunity to practice; "M"=mastery at the senior or exit level; "A"=assessment evidence collected (Exams??)

Tropical Medicine (TRMD) Course Descriptions

TRMD 499 Reading and Research (V) Directed reading and research in laboratory; diagnostic aspects of bacterial, parasitic, and viral infections. Pre: consent.

TRMD 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

TRMD 545 Topics in Tropical Medicine (V) Elective for fourth-year medical students for advanced study of selected topics within the field of tropical medicine and medical microbiology. Pre: fourth-year standing.

TRMD 595 (Alpha) Selected Topics in Infectious Diseases (1) Elective for medical students; (B) infectious diseases; (C) parasitology; (D) epidemiology; (E) immunology. MD majors only. CR/NC only. Pre: MDED 554 or consent. Fall only.

TRMD 599 (Alpha) Selected Research Topics in Infectious Diseases (1) Research elective for medical students; (B) infectious diseases; (C) parasitology; (D) epidemiology; (E) immunology. MD majors only. CR/NC only. Pre: MDED 554 or consent. Fall only.

TRMD 601 Tropical Medicine Journal Club (1) Discussion of current literature relevant to Tropical Medicine. Repeatable.

TRMD 603 Infectious Disease Microbiology I: Medical Parasitology (3) Epidemiology, pathogenesis, immunobiology and diagnostic aspects of human parasitic infections; principles of host-pathogen interactions; public health aspects of parasitic infections. Repeatable one time. A-F only. Pre: MICR 351 or equivalent. (Fall only)

TRMD 604 Concepts in Immunology and Immunopathogenesis (2) Immunological concepts relating to infectious diseases and host pathogen interactions. Repeatable one time. A-F only. Pre: MICR 461 (or equivalent) or consent. (Cross-listed as PH 665)

TRMD 605 Infectious Disease Micro II (3) This course will cover different families of animal viruses of importance to human diseases. The genome, structure, and replication cycle of viruses, as well as host immune responses, epidemiology, clinical features and animal models will be covered and integrated to understand the pathogenesis of diseases caused by different viruses and intervention strategies of therapy and vaccine. Repeatable one time. A-F only. Pre: MICR 351 and TRMD 604; or consent. Spring only. (Cross-listed as PH 667)

TRMD 606 Tropical Medicine Laboratory Rotations (V) Practical experience in use of equipment and procedures in infectious disease and immunology research; introduction to research in tropical medicine. Repeatable unlimited times. Pre: 604 (or concurrent), or consent. (Cross-listed as PH 668)

TRMD Course Descriptions cont'd

TRMD 607 Neurovirology (1) Seminar course on neuroinvasive viruses giving basics of viruses causing nervous system diseases and discussing recent advances in the research field of neurovirology. Pre: MICR 351 or equivalent; or consent. Fall only.

TRMD 608 Infectious Disease Micro III (3) This course will cover the basic structure, physiology and genetics of pathogenic bacteria as well as the host response to these organisms. Major bacterial diseases will be covered in depth to correlate bacterial structure, physiology, epidemiology and host response to these microorganisms to understand the pathogenesis of the diseases they cause. Repeatable one time. A-F only. Pre: MICR 351 and TRMD 604; or consent. Fall only.

TRMD 609 Advances In Medical Immunology (3) Presentations/discussions of current literature concerning recent advances in immunology relevant to disease and to disease processes. Pre: consent. (Alt. years: spring)

TRMD 610 Infection and Immunity (2) This course will provide a detailed description of specific pathogens (bacterial, viral, parasitic and fungal) and their interactions with the human immune system, including innate and acquired immunity.

TRMD 650 Advanced Epidemiological Ecology of Infectious Diseases (2) Applications of population biology, pathogen/host life history, and population genetics to infectious disease epidemiology, including micro- and macroparasites, and implications to disease control and prevention of strategies. A-F only. Pre: 604 (or concurrent) and 605 (or concurrent), or consent. (Alt. years: spring)

TRMD 652 Advanced Genetics and Evolution of Infectious Diseases (2) An evolutionary perspective to examine the interactive responses between infectious agents and the immune system. Topics will include natural selection, life history evolution, population genetics of pathogens and hosts, and anti-microbial resistance. A-F only. Pre: 604 (or concurrent) and 605 (or concurrent), or consent. (Alt. years: spring)

TRMD 653 Bioinformatics for Infectious Diseases (1) Combined lecture/computer lab course on bioinformatic tools used in genomics, including sequence assembly, search algorithms, alignment, phylogenetics, and molecular evolution/epidemiology. Focus will be on infectious disease examples. Open to nonmajors. A-F only. Pre: 604 (or concurrent) and 605 (or concurrent) or consent. Fall only.

TRMD 671 Advanced Medical Parasitology (2) Consideration of ultrastructure, physiology, biochemistry, in-vitro cultivation and host-parasite relationship of parasites of medical importance. A-F only. Pre: consent. (Alt. years: fall)

TRMD 672 Advanced Medical Virology (2) In-depth study of the major groups of viruses pathogenic for human; virus replication, host range, pathogenesis, immunology, and epidemiology. Pre: 605 or equivalent, or consent. (Alt. years: fall)

TRMD 673 Advanced Medical Bacteriology (2) Role of bacteria in infectious diseases, with emphasis on clinical aspects and identification of etiological agents. Pre: 605 or equivalent, or consent.

TRMD 690 Seminar in Tropical Medicine and Public Health (1) Weekly discussion and reports on current advances in tropical medicine and public health. (Cross-listed as PH 755)

TRMD 695 Plan B Master's Project (3) Independent study for students working on a Plan B Master's project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. Pre: graduate standing in TRMD.

TRMD 699 Directed Research (V) Directed research in medical microbiology (bacteriology, parasitology, virology). Pre: consent.

TRMD 700 Thesis Research (V) Research for master's thesis. Approval of department faculty required.

TRMD 705 Special Topics in Tropical Medicine (1) Advanced instruction in frontiers of tropical medicine and public health. Repeatable. (Cross-listed as PH 756)

TRMD 800 Dissertation Research (V) Research for doctoral thesis. Approval of department faculty is required.

Pharmacology (PHRM) Course Descriptions

PHRM 201 Introduction to General Pharmacology (2) Drugs discussed with emphasis on sites and mechanism of action, toxicity, fate, and uses of major therapeutic agents. Pre: mammalian physiology and dental hygiene major. NI DB

PHRM 203 General Pharmacology (3) Similar to 201 but wider in scope of drugs discussed. Intended for undergraduates in the health sciences and related fields. Pre: mammalian physiology. NI DB

PHRM 499 Directed Reading and Research (V) Directed reading and research in experimental pharmacology. Repeatable unlimited times. Pre: consent.

PHRM 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Repeatable unlimited times. Pre: master's Plan B or C candidate and consent.

PHRM 595 Principles of Pharmacology (1) Pharmacology elective course for medical students. MD students only. CR/NC only. Pre: MDED 554 or consent. (Fall only)

PHRM 599 Research in Pharmacology (V) Pharmacology research elective for medical students. MD majors only. CR/NC only. Pre: MDED 551 or consent.

PHRM 601 General Pharmacology (3) Pharmacodynamics, receptor theory, modeling, clinical trials and the FDA will be covered. Concepts in ADME/T and clinical research are also considered. Pre: consent.

Pharmacology (PHRM) Course Descriptions Cont'd

PHRM 602 Systemic Pharmacology (9) Provides instruction at an organ systems/functional level covering major organ and functional systems of the human body. Concepts in pharmacological research at the animal, organ system and whole human level will also be considered. Repeatable one time. Pre: consent.

PHRM 640 Neuropharmacology (2) Physiology and pharmacology of central and peripheral nervous systems, focusing on synaptic chemistry and signaling. A-F only. Pre: CMB 606, or consent from the course director. (Cross-listed as CMB 640)

PHRM 699 Directed Research (V) Repeatable unlimited times.

PHRM 700 Thesis Research (V) Repeatable unlimited times.

PHRM 800 Dissertation Research (V) Repeatable unlimited times.

Scholarships, Awards and Tuition Waivers

Graduate Assistantships

Teaching Assistantships

Teaching assistants (TAs) usually have a 9-month appointment that corresponds with the academic year. The specific duties of a TA vary depending on the needs of the department and on the qualifications and experiences of the TA. All TAs serve under the direction and supervision of a regularly appointed member of the faculty. They may teach a section of a multi-section course or a laboratory section of a course. In addition, they may assist a faculty member in grading assignments or exams, advising students, or performing course-related administrative duties. Occasionally, an experienced TA may be assigned as the instructor of a course. In such a case, the TA must meet all the qualifications required of a lecturer for the course, or have completed a relevant training program. All new TAs are required to attend a training session offered by the Office of Faculty Development and Academic Support — Center for Teaching Excellence.

University policy stipulates that in a course taught by a TA, the determination of final grades is the responsibility of the supervising faculty. However, since the TA plays a significant role in determining grades, the supervising faculty and the TA should thoroughly discuss course grading policies and procedures. To ensure fairness to all students enrolled in the course, grading policies and procedures should be announced in the beginning of the semester. TAs should be knowledgeable about official university policies on credits and grades, disciplinary actions, and academic grievance procedure. They should also be aware of the various student services available at the Office of Student Affairs, so that they may refer students to the appropriate resources when necessary.

Research Assistantships

Research assistants (RAs) usually have an 11-month appointment. In general, a RA supports the research activities of a faculty who is the principal investigator of a funded project. The specific duties of a RA vary depending on the needs of the project and on the qualifications and experiences of the RA. The duties may be directly or tangentially related to the RA's program of study, while results from the research project may be incorporated into a thesis or dissertation as relevant. Some RAs exercise a great degree of independence while performing their duties; others carry out specific tasks that leave little room for independent judgment. RAs should be knowledgeable about official university policies on research and publication.

Tuition Exemption

GAs with 0.50 FTE appointments receive a full tuition exemption. New GAs with 11-month appointment must be employed for at least 12 weeks during the first semester in order to receive the tuition exemption. Tuition exemptions apply only to fall and spring semesters, and may NOT be used for Outreach College and Distance Education courses. Summer Session tuition exemptions, when available, are issued by the Outreach College. GAs are responsible for the payment of fees. GAs who resign before serving at least three-quarters of a semester are liable for repayment of tuition exemptions.

Health Plan

GAs with 0.50 FTE appointment who serve for a minimum of three months are eligible for health plan benefits. For more information, contact the personnel officer in the department or unit of hire.

Parking Permit

To purchase parking permits, GAs need to obtain first a memo from their department or unit of hire. They then present the memo along with all other required documents to the Parking and Transportation Services.

Graduate Division Achievement Awards

A limited number of merit-based Graduate Division Achievement Scholarships are available to qualified Tropical Medicine graduate students.

Eligibility & How to Apply

To be eligible, a student must be a student in the master's or doctoral program and have a cumulative GPA of 3.5 or above. Students apply through their graduate programs. Awards are competitive. US citizens and permanent residents may apply for funding related to support any aspect of their education and training while non-residents may only apply for tuition support.

Award Amount

The award amount varies, depending on the purpose of the award and funding availability. Minimum award is \$500.

Award Conditions

Award recipients must maintain an enrollment of six credits or more of degree-related courses and a cumulative GPA of 3.5 or above, for the entire period of the award. Recipients will be liable to reimburse UHM for the full amount of the award, if they fail to meet the award conditions or if for any other reason the award becomes invalid.

Award Distribution Procedure

The Graduate Division allocates achievement scholarships to graduate programs, which in turn distribute the awards to qualified students via BANNER and STAR at the time of registration. For scholarships made to international students, the total amount of awards distributed via BANNER and STAR may not exceed the total cost of tuition and fees.

Joseph E. Alicata Award in Tropical Medicine

The Joseph E. Alicata Award was established in 1981 by Dr. Joseph Alicata and Mrs. Earleen Alicata to encourage the study of Tropical Medicine and Infectious Diseases and to reward outstanding scholastic achievement by graduate students in this field of study. It commemorates the lifetime achievements of Dr. Alicata in parasitology and public health as a professor at the University of Hawaii and a commissioned officer of the US Public Health Service.

There are two merit-based mechanisms for distribution of the Alicata Award:

1. A partial graduate assistantship to selected, incoming PhD students during their first year of graduate training,
2. An achievement award to graduating PhD students during the final semester of their graduate education.

In both cases the award amount varies depending on the purpose of the award and funding availability.



2011 recipients of Alicata Award James Kelley, Esther Volper, and Yeung Tutterow (second from left to right) receive congratulations from Dr. Chang (left).

WICHE Program

The Tropical Medicine graduate program participates in the Western Regional Graduate Program (WRGP), administered by the Western Interstate Commission on Higher Education (WICHE). The program enables legal residents of WICHE member states to enroll in selected out-of-state graduate programs at reduced tuition rates. Below is a list of WICHE member states.

- Alaska
- Arizona
- California
- Colorado
- Hawai'i
- Idaho
- Montana
- Nevada
- New Mexico
- North Dakota
- Oregon
- South Dakota
- Utah
- Washington
- Wyoming

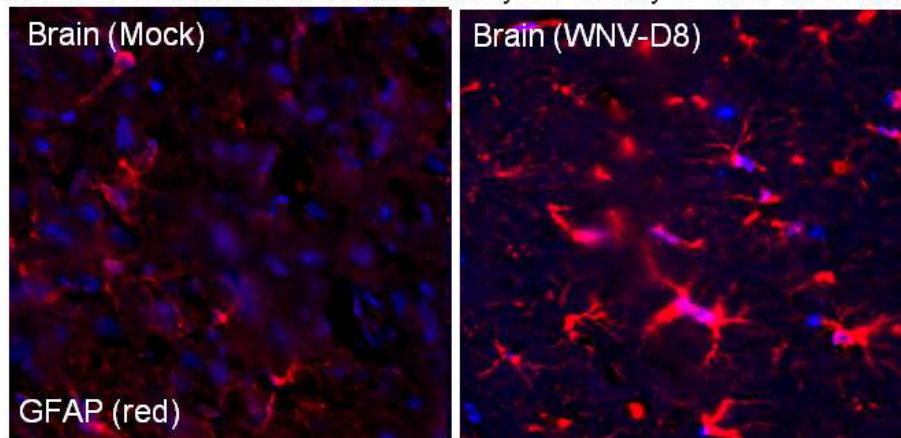
Through WRGP, legal residents of WICHE member states may enroll in selected out-of-state graduate programs at resident tuition rates. They apply directly to the institutions of their choice and identify themselves as WICHE WRGP applicants. WICHE WRGP applicants applying to UHM are required to meet the GPA requirement of 3.5 or higher, or otherwise possess certain exceptional abilities as affirmed by the UHM graduate program to which they apply.

Other Funding Opportunities

In addition to the mechanisms described above, there are a number of intramural and extramural funding opportunities available to Tropical Medicine graduate students. For more information on these resources, consult the Graduate Division funding opportunities site:

<http://manoa.hawaii.edu/grad/financial-matters/funding-opportunities>

WNV induces activation of brain astrocytes at day 8 after infection in mice



Useful Links

Graduate Division Sites

Home Page

<http://manoa.hawaii.edu/graduate/>

Graduate Division Policies

<http://manoa.hawaii.edu/graduate/content/current-students>

Graduate Assistant Information

<http://manoa.hawaii.edu/graduate/content/graduate-assistants>

Graduate Academic Grievance Procedures

<http://manoa.hawaii.edu/graduate/content/academic-grievance>

UH Mānoa Student Conduct Code

http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code/

Graduate Division Facebook Page

<http://www.facebook.com/uhmgd>

Graduate Division Forms

<http://manoa.hawaii.edu/graduate/content/forms>

Other Useful Sites

John A Burns School of Medicine (JABSOM) website

<http://jabsom.hawaii.edu/jabsom/>

Department of Tropical Medicine, Medical Microbiology & Pharmacology website

<http://t3mp.jabsom.hawaii.edu/en/>

Department's Facebook Page

<http://www.facebook.com/pages/Department-of-T3MP-at-JABSoM/158846894127939>

UH Manoa online catalog:

<http://www.catalog.hawaii.edu/>

Get a UH username:

<https://sunsys.its.hawaii.edu/acctmgmt/>

Course Registration:

<http://www.hawaii.edu/myuh/manoa/>

Financial Aid:

<http://www.hawaii.edu/fas/>

Other Useful Sites cont'd

Health Insurance:

<http://www.hawaii.edu/shs/studentinsurance.htm>

Graduate Student Organization:

<http://gso.hawaii.edu/>

Health Sciences library:

<http://www.hawaii.edu/hslib>

JABSOM Bulletin (catalog):

<http://jabsom.hawaii.edu/JABSOM/about/jabsom10-11.pdf>

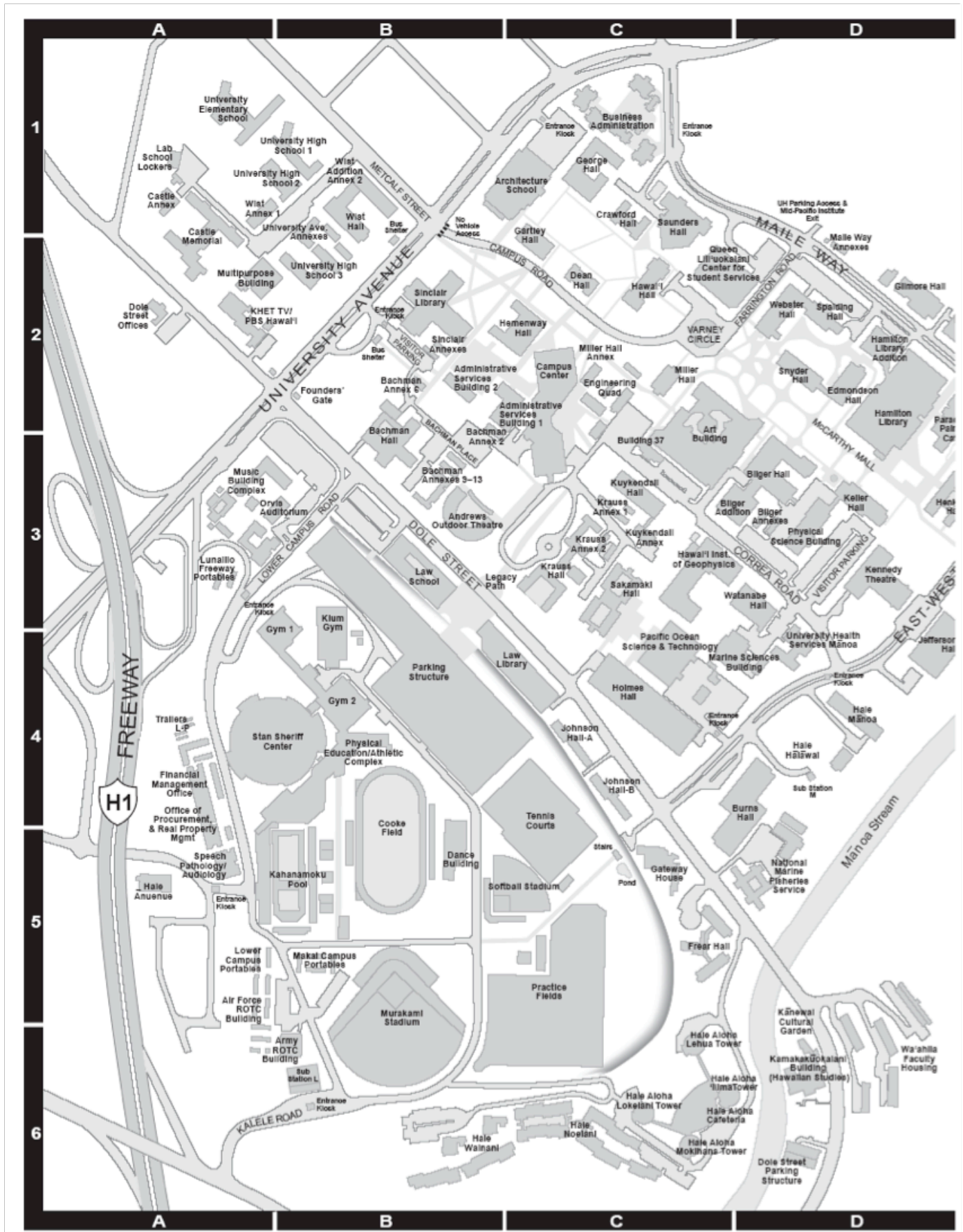
American Society of Tropical Medicine & Hygiene (ASTMH):

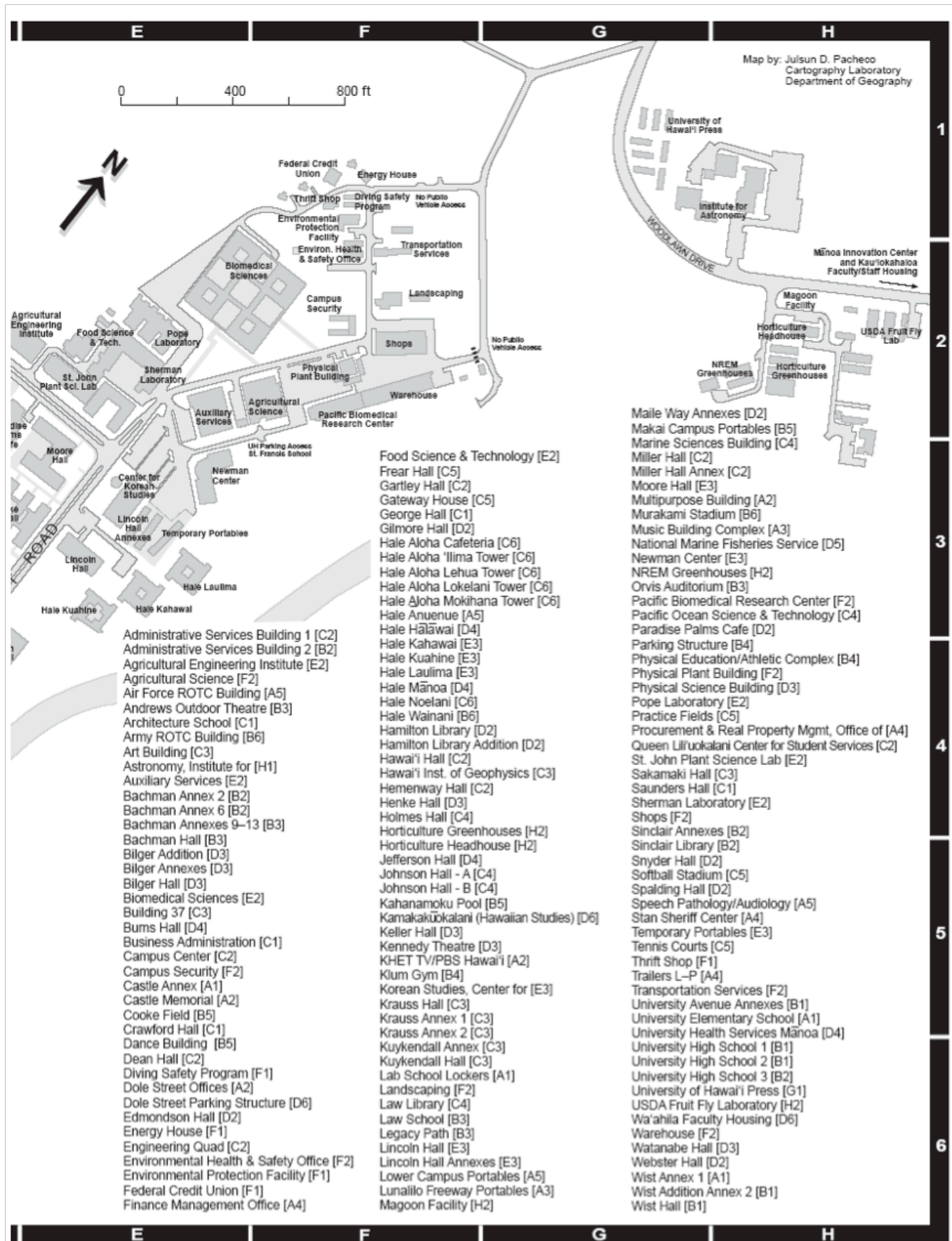
<http://www.astmh.org/>

Map to John A. Burns School of Medicine Kaka'ako Campus



651 Ilalo St., Honolulu, HI 96813
<http://jabsom.hawaii.edu/jabsom/about/map.php>





GRADUATE FACULTY DESCRIPTIONS & CONTACT INFORMATION

Name	Rank and Department	Research Interests
Jason D Barbour, Ph.D. (Univ. of California, San Francisco), jbarbour@hawaii.edu	Associate Professor Tropical Medicine	HIV, immunology, pathogenesis, epidemiology, genetics, clinical outcomes, bioinformatics, HIV drug resistance
Shannon N. Bennett, Ph.D. (Univ. of British Columbia, Canada), sbennett@hawaii.edu	Associate Professor Tropical Medicine	Virus evolution and molecular epidemiology; Dengue virus evolutionary dynamics; arbovirus-vector interactions
Sandra Perreira Chang, Ph.D. (Oregon Health Sciences University), sandrac@hawaii.edu	Professor Tropical Medicine	Malaria immunity & vaccine development, molecular evolution of <i>P. falciparum</i> , malaria metabolomics
Moti L. Chapagain, M.B.B.S., M.H.P.E.D., M.S., Ph.D. (Tribhuvan Univ, Kathmandu, Nepal; Univ of NSW, Sydney, Australia; Univ. of Hawaii), moti@hawaii.edu	Assistant Research Professor Tropical Medicine	Pathogenesis of WNV-associated encephalitis and progressive multifocal leukoencephalopathy; JCV-host cells interactions, NCCR rearrangement and BBB transmigration.
Abby Collier, Ph.D. (University of Auckland Medical School), acollier@hawaii.edu	Assistant Professor Pharmacology	Pharmacokinetics, pharmacodynamics, molecular studies of drug metabolism, reproductive pharmacology and teratogenesis
Arwind R. Diwan, Ph.D. (Univ. of London, School of Hygiene & Tropical Medicine), arwind@hawaii.edu	Professor Tropical Medicine (retired, emeritus)	Chemotherapy of virus diseases; viral vaccines; oncogenic viruses; slow virus infections; hepatitis; AIDS
Eiichi Furusawa, MD/Ph.D (Osaka, Japan), 956-3168	Professor Pharmacology (retired, emeritus)	Pharmacology of natural products, viral and cancer chemotherapy
William L. Gosnell, Ph.D. (Univ. of Hawaii), gosnell@hawaii.edu	Junior Researcher Tropical Medicine	Pathophysiology and immunology of parasitic infections particularly <i>P. falciparum</i> and neglected tropical diseases (NTD)
George S.N. Hui, Ph.D. (Univ. of Hawaii), ghui@hawaii.edu	Researcher Tropical Medicine	Immunology of parasitic infections, immunomodulators for parasite vaccines, cell biology of protozoan parasites
Pakieli Kaufusi, Ph.D. (Univ. of Hawaii), pakieli@hawaii.edu	Junior Researcher Tropical Medicine	Molecular aspects of West Nile virus replication to understand disease pathogenesis and development of an anti-WNV therapy.
Kenton J. Kramer, Ph.D. (Univ. of Hawaii), Kramer@hawaii.edu	Associate Professor Tropical Medicine	Parasitic diseases of the Pacific; amebic infections in Hawaii; Community Medicine Program for Health Promotion; epidemiologic/immunologic methods of malaria control
F. DeWolfe Miller, Ph.D. (Univ. Michigan), dewolfe@hawaii.edu	Professor Tropical Medicine	Infectious disease epidemiology
Lishomwa C Ndhlovu, M.D., Ph.D. (Tohoku University, Sendai, Japan), Indhlovu@hawaii.edu	Assistant Professor Tropical Medicine	HIV immunology
Vivek R. Nerurkar, Ph.D. (U. of Bombay, India), nerurkar@hawaii.edu	Professor and Chairperson Tropical Medicine	Pathogenesis of infectious diseases; cellular & molecular mechanisms underlying microbe-host interaction.
Leslie Q. Tam, Ph.D. (Univ. of Hawaii), taml@hawaii.edu	Professor Tropical Medicine (retired, emeritus)	<i>P. falciparum</i> merozoite surface & rhoptry antigens; bacterial cell wall adjuvants
Diane Wallace Taylor, Ph.D. (University of Hawaii), dwtaylor@hawaii.edu	Professor Tropical Medicine	Maternal and neonatal immunity to malaria
Saguna Verma, Ph.D. (Devi Ahilya University, India), saguna@hawaii.edu	Assistant Professor Tropical Medicine	To understand mechanisms associated with (i) host innate and inflammatory responses and (ii) blood-brain barrier disruption in WNV infection to develop effective therapies that ameliorate WNV-associated pathology

Wei-Kung Wang, M.D., D.Sc. (Harvard School of Public Health), wangwk@hawaii.edu	Professor Tropical Medicine	Molecular virology of dengue virus (structural proteins and virus-like particles) and humoral immune responses after dengue virus infection
Karen M. Yamaga, Ph.D. (Univ. of Hawaii), yamaga@hawaii.edu	Professor Tropical Medicine (retired, emeritus)	Immunological mechanisms of diseases; pathogenesis of rheumatoid arthritis
COOPERATING GRADUATE FACULTY		
John Berestecky, Ph.D. (Univ. of Hawaii), johnb@hawaii.edu	Associate Professor Kapiolani Community College	Epidemiology & pathogenesis of Campylobacter enteritis, immune response of Hawaiian Green Turtles, identification of plant pathogens using monoclonal antibodies
Mona Bomgaars, MD, MPH mbomgaars@hawaii.rr.com	Hansen's Disease Branch State Dept. of Health (retired)	Hansen's disease and international health, disaster medicine
Linda Chang, M.D. M.S., FAAN (Georgetown University), lchang@hawaii.edu	Professor Medicine (Neurology)	Application of advanced neuroimaging techniques to study brain changes associated with HIV, substance abuse, brain development and aging
Guliz Erdam, M.D. (Hacettepe University Faculty of Medicine, Turkey), guliz@hawaii.edu	Professor Pediatrics	Molecular epidemiology of group A streptococcal & staphylococcal infections; complications of strep infections like acute rheumatic fever.
Yuanan Lu, Ph.D. (University of Hawaii), ylu@pbrc.hawaii.edu	Professor Public Health Sciences	Novel gene therapy for HIV-1 infection in the central nervous system; Marine drugs and their antiviral activities; Test and development of a novel, rapid method for pathogen and pathogen indicator detection in environmental waters
Marian E. Melish, M.D. (Univ. of Rochester), marianm@kapiolani.org	Professor Pediatrics	Staphylococcal infection and toxins; clinical infectious disease; Kawasaki's syndrome
Bruce Shiramizu, M.D. (Univ. Utah, Salt Lake City) bshiramiz@hawaii.edu	Professor Medicine and Pediatrics	Pathobiology of HIV-associated disorders; human papilloma virus-associated cancers
Elizabeth K. Tam, M.D. (Univ. of California, San Francisco), tameliza@hawaii.edu	Professor Medicine	Genetic & environmental determinants of respiratory disease (eg. asthma); volcanic air pollution & modulators of respiratory health; genetics & tobacco smoke in lung disease.
Richard Yanagihara, M.D. (Univ. of Cincinnati), yanagiha@pbrc.hawaii.edu	Professor Pediatrics	Transdisciplinary investigations of emerging & re-emerging infectious diseases; use of infectious agents to trace ancient & recent movements of human populations.

Sample TRMD MS Plan A (Thesis) Timeline

Fall, Year 1	Spring, Year 1	Fall, Year 2	Spring, Year 2
Preliminary conference with graduate chair; appointment of interim advisor	Appointment of permanent advisor & thesis committee; first meeting with thesis committee	Submission of thesis topic & proposal to thesis committee; progress meeting(s) with thesis committee Obtain regulatory approvals for thesis research	Progress meeting with thesis committee Oral examination of thesis research by thesis committee
<u>Core Courses:</u> TRMD 603: IDM I (Parasitology) TRMD 604: Immunology TRMD 653: Bioinformatics TRMD 690: TRMD Seminar (Attend; CR/NC)	<u>Core Courses:</u> TRMD 605: IDM II (Virology) TRMD 608: IDM III (Bacteriology & Mycology) TRMD 690: TRMD Seminar (Presentation of thesis proposal; letter grade)	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar (Presentation of thesis research; letter grade)
TRMD 606: TRMD Lab Rotation	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 700: Thesis Research
Fall or Spring: CMB 626 or MICR 614: Research Ethics TRMD 699: Dir. Reading (Journal Club)		Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	
December: Diagnostic Exam	August: Qualifying Exam		
	Completion of Form I: Pre-candidacy progress	Completion of Form II: Advance to Candidacy	Completion of Form III: Certification of final oral exam and thesis defense Completion of Form IV: Committee Approval of Written Thesis
	Poster Presentation at Local Conference	Fall or Spring: Poster or Oral Presentation at National Conference	
		Write and submit manuscript on thesis research	

Sample TRMD PhD Timeline

(Duration of training may be from 3-5 years depending on individual circumstances)

Year 1	Year 2	Year 3	Year 4	Year 5
Fall	Fall	Fall	Fall	Fall
Preliminary conference with graduate chair; appointment of interim advisor	Progress meeting(s) with dissertation committee	Progress meeting(s) with dissertation committee	Progress meeting(s) with dissertation committee	Progress meeting(s) with dissertation committee
Core Courses: TRMD 603: IDM I (Parasitology) TRMD 604: Immunology TRMD 653: Bioinformatics TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar
TRMD 606: TRMD Lab Rotation	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research
Fall or Spring: CMB 626 or MICR 614: Research Ethics TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)
December: Diagnostic Exam				
		Write & submit research manuscripts		
Spring	Spring	Spring	Spring	Spring
Appointment of permanent advisor & dissertation committee; first meeting with committee	Submission of thesis topic & proposal to committee for approval Submission of comprehensive examination proposal to committee Obtain regulatory approvals for research	Progress meeting(s) with dissertation committee	Progress meeting(s) with dissertation committee	Progress meeting(s) with dissertation committee
Core Courses: TRMD 605: IDM II	Elective, Advanced Courses	Elective, Advanced Courses	Elective, Advanced Courses	TRMD 690: TRMD Seminar (Dissertation)

Core Courses: TRMD 605: IDM II (Virology) TRMD 608: IDM III (Bacteriology & Mycology) TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	Elective, Advanced Courses TRMD 690: TRMD Seminar	TRMD 690: TRMD Seminar (Dissertation Seminar & Defense)
TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 800: Dissertation Research (requires prior submission of Form II)
Fall or Spring: CMB 626 or MICR 614: Research Ethics TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)	Fall or Spring: TRMD 699: Dir. Reading (Journal Club)
August: Qualifying Exam	Comprehensive Exam: review of written grant proposal and oral examination by committee			Final Examination and Dissertation Defense: seminar presentation, defense and oral examination
Completion of Form I: Pre-candidacy progress	Completion of Form II: Advance to Candidacy			Completion of Form III: Dissertation Evaluation Completion of Form IV: Approval of Written Dissertation
Poster Presentation at Local Conference	Oral or Poster Presentation at Local or National Conference	Oral or Poster Presentation at Local or National Conference	Oral or Poster Presentation at Local or National Conference	Oral or Poster Presentation at National Conference
	Write & submit research manuscripts			
Summer	Summer	Summer	Summer	
TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research	TRMD 699: Directed Research	

Notes: