

Department of Tropical Medicine, Medical Microbiology & Pharmacology

The Department of Tropical Medicine, Medical Microbiology & Pharmacology at the John A Burns School of Medicine has trained many US and international students in tropical infectious disease research since the establishment of its graduate program in 1976. Key research areas include infectious disease immunology, pathogenesis, and vaccine and drug development for dengue, malaria, and HIV/AIDS, and basic, genomic and epidemiological research on emerging infectious diseases caused by hantaviruses, West Nile virus, Zika virus, and Nipah virus.

The mission of the department is *"to provide the future leaders in infectious diseases a world-class transdisciplinary research, training and teaching program that focuses on basic, translational, and field research on microbial diseases of global public health importance and with special interests to Hawaii and the Asia-Pacific region"*. In keeping with this mission, its faculty members have long-standing international collaborative research projects in Egypt, Cameroon, Peru, Australia, Singapore, Malaysia, Thailand, Viet Nam, Philippines, South Korea, China, India, and US-Affiliated Territories in the Pacific.

The goal of the department to serve as a regional translational science center of research excellence for new, emerging and re-emerging infectious diseases is promoted by the Pacific Center for Emerging Infectious Diseases Research, supported by the Centers of Biomedical Research Excellence (COBRE) at the National Institute of General Medical Sciences, NIH. The department is equipped with an insectary and a Biosafety Level 3 containment laboratory for in vitro research and animal studies, and has a BSL3 training program in place for students who study pathogens requiring this level of containment. Quantitative training and support for trainees is provided by faculty of the Biostatistics and Data Management Core. Recently the department established a CLIA certified diagnostic laboratory for diseases unique to Hawaii.

For information on international research for medical students, contact Dr. Vivek Nerurkar (nerurkar@hawaii.edu).

Researchers:**Vivek R. Nerurkar, PhD, Chair**

Dr. Nerurkar joined the University of Hawaii at Manoa in 1994 to develop the Research Centers in Minority Institutions Program, NCCR supported Retrovirology Activity following a five-year appointment as a Visiting Fellow and Visiting Associate of the NINDS, NIH. His major area of research interest is in infectious diseases, specifically the study of pathogenesis of orphan diseases and orphan microbial agents. Over the past two decades he has conducted research in the diverse but related areas of virology, specifically neurovirology. Email: nerurkar@hawaii.edu

Sandra Chang, PhD, Graduate Chair

Dr. Chang is a Professor of Tropical Medicine and Chair of the Tropical Medicine Graduate Program. She joined the department in 1986 as an Assistant Researcher in the malaria vaccine development program and currently is principal investigator on research projects on malaria immunology and vaccine development and metabolomic analysis of *P. falciparum*-infected erythrocytes. Dr. Chang teaches graduate courses in infectious disease immunology and immunopathogenesis and lectures on topics related to immunology and vaccination for graduate and medical students. Email: sandrac@hawaii.edu

William Gosnell, PhD, Program Director for the Certificate in Tropical Medicine.

My academic interests have ranged across the field of medical microbiology but always focusing primarily upon the immunologic response in human infectious diseases. I am particularly interested in the area of host-parasite interactions relating to immunity to disease and its implications for diagnostic and treatment modalities. To date I am actively working in three different, but related areas with some of the most widespread infectious diseases in the world, malaria and human helminthiasis. Email: gosnell@hawaii.edu

George Hui, PhD

My research is on the development of blood stage malaria vaccines; and studies on the use of different vaccine adjuvants for the malaria vaccines. Specifically, we focus on the design of vaccines based on the Merozoite Surface Protein 1 (MSP1) by defining critical T and B epitopes of the molecule. We also evaluate the use of a variety of immunological adjuvants to enhance vaccine potency and at the same time define the critical pathway for adjuvants' mode of action. Our approaches also study the use of nanoparticle platforms for antigen delivery. Beside research, I am also the director of a biomedical sciences research training for high school and college bound students (STEP-UP Program, <http://stepup.niddk.nih.gov>),

supported by NIDDK/NIH. The project recruits minority and disadvantage students from the Pacific Regions, Alaska and Puerto Rico into university/college research laboratories to engage in health related research under the mentorships of university faculty. Email: ghui@hawaii.edu

Kalpana Kallianpur, PhD

Dr. Kallianpur's research interests include the use of magnetic resonance imaging (MRI) to study the effects of HIV on brain structure and function. She has demonstrated associations between brain atrophy and the peripheral HIV DNA reservoir, and is currently examining resting-state functional brain networks in relation to HIV-related cognitive decline and other complications of HIV disease. Dr. Kallianpur joined the Hawaii Center for AIDS in 2008 and the Department of Tropical Medicine in 2016. Email: kalpana@hawaii.edu

Pakieli Kaufusi, PhD

Dr Kaufusi research explores the pathogenicity and pathophysiology of West Nile and dengue viruses. Email: pakieli@hawaii.edu.

Kenton Kramer, PhD

Dr. Kramer is interested in the epidemiology and diagnosis of parasitic infections in the Pacific. He is the contact person for medical students seeking research opportunities for the Department. Email: kramer@hawaii.edu

Axel Lehrer, PhD

Dr. Lehrer joined the department in 2013 following a career in the biotechnology industry. In his current position, Dr. Lehrer assists with education and training of biomedical students and is the Project Manager of the recombinant Filovirus vaccine project and is currently working on an Ebola vaccine as well as a SARS CoV-2 vaccine. lehrer@hawaii.edu

Bruce Shiramizu, MD

Dr. Shiramizu joined the University of Hawaii at Manoa in 1997 as an investigator in the Hawaii Center for AIDS. His research interests include studying the role of HIV-1 in causing neurological problems and cancer; and childhood cancers. Email: bshirami@hawaii.edu

Angela Sy, PhD

Research areas: health disparities, community based participatory research, Asians and Pacific Islanders, cancer prevention, colorectal cancer screening. Email: sya@hawaii.edu

Saguna Verma, PhD

Dr. Verma is a formally trained virologist and immunologist with expertise in the studies of RNA virus/host interactions and innate immunity. Her long-term research goal is to understand inflammatory pathways contributing to

the neuropathogenesis related to flaviviruses to ultimately develop effective therapies to ameliorate the associated pathology. Email: saguna@hawaii.edu

Wei-Kung Wang, MD, ScD

Currently, no antiviral or vaccine against dengue virus (DENV) is available to treat or prevent infections with the four serotypes of DENV, the leading cause of arboviral diseases worldwide. Dr. Wang demonstrated that the level and rate of decline of DENV load and virus-containing immune complexes correlated with disease severity, and reported for the first time the quasispecies nature of DENV in humans and mosquitoes. Recently, he focused on the precursor membrane (prM)/envelope (E) proteins of DENV, virus-like particles and antibody responses. He reported the highly conserved stem regions of prM/E proteins are involved in two important steps of replication and are potential targets of antivirals. Moreover, his lab developed a high-throughput dot blot assay for epitope mapping of anti-E antibodies by alanine-substitution mutants of the surface-exposed E residues. These findings have significant implications for dengue pathogenesis and vaccine development. Email: wangwk@hawaii.edu

Angel Yanagihara, PhD

The overall objective of our research program is the systematic biochemical and pathophysiological characterization of novel toxins and bioactive compounds from venomous marine invertebrates of regional importance. ayanagh@hawaii.edu

Cecilia Shikuma, MD

Cecilia M. Shikuma, MD is Director of the Hawai'i Center for AIDS, a University of Hawai'i Board of Regents' approved Center of Excellence for HIV research, training and care. She is also Professor of Medicine and the Edwin C. Cadman Endowed Chair, JABSOM, University of Hawai'i – Mānoa (UHM). She received both her BS and MD from UHM, and completed her Infectious Disease fellowship at the Los Angeles County (LAC) – University of Southern California (USC) Medical Center. She is the recipient of numerous HIV-related research grants from the National Institute of Health to research chronic, non-infectious complications of HIV including lipodystrophy, cardiovascular disease, peripheral neuropathy and HIV-associated dementia. Email: shikuma@hawaii.edu

Richard Yanagihara, MD, MPH

Formerly a tenured intramural NIH investigator, Dr. Richard Yanagihara joined the Research Centers in Minority Institutions (RCMI) program at the University of Hawai'i at Manoa through an interagency personnel agreement in 1995 to assist in building capacity for a laboratory-based retrovirology research program. He has served as the RCMI Program Director since 2000 and as the principal investigator of the Pacific Center for Emerging Infectious Diseases Research since 2003. As such, he has played a critical role in

coordinating the development of much-needed infrastructure for infectious diseases research, which has involved direct mentoring of junior and mid-career faculty, as well as developing programs that award modest grant support for pilot projects, as well as bridging funds to faculty who are transitioning off of career development or departmental institutional support. Prior to joining the University of Hawai'i at Manoa, Dr. Yanagihara was the on-site NINDS Project Officer of a ABSL-3/BSL-3 primate facility within the Laboratory of Central Nervous System Studies in Frederick, Maryland, where he supervised postdoctoral fellows and visiting scientists. His scientific explorations have taken the form of problem-based, disease-oriented, long-term, high-risk, multidisciplinary, opportunistic investigations of medically urgent phenomena of worldwide importance, conducted largely in the context of exploiting naturally occurring paradigms of high-incidence "place diseases" among human populations isolated by virtue of their genetics, culture and/or geography. Email: yanagiha@pbrc.hawaii.edu