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E komo mai

Thank you for coming to E Ho‘oulu Haumāna 2018. Tonight, students participating in the Minority Health and Health Disparities International Research Training (MHIRT) program will share their international research experiences with us. We are sure everyone will enjoy their presentations.

MHIRT 2018 is in the fifth year of the program. During the first four years of the program, 38 students completed the program; conducted research in Cameroon, Thailand, Germany, Palau and India; and are now continuing their academic or professional careers. They are the best recruiting tool we have. This year, we were excited when a large number of students applied for the program. After a very competitive process, in January 2018 twelve students were selected. From the first meeting, it was clear that MHIRT 2018 students were bright, hardworking and full of energy. We have truly enjoyed working with them.

The short-term goals of the MHIRT program are to provide each student with an intellectually stimulating research experience, an interesting culture exchange, and a safe return home from abroad. Over the last eight months, many people have contributed their time, talent, and expertise to ensure success of the MHIRT program. We send a huge MAHALO to the MHIRT students, the University of Hawai‘i faculty mentors, the international mentors, the faculty who have participated in the pre- and post-travel workshops, and the staff for their organizational skills. But most of all, we want to thank the parents, families, and friends for their support. Without the support of the MHIRT families, this project would not be possible. I personally thank Dr. Angela Sy and Ms. Laarni Sumibcay for their hardwork in keeping the MHIRT program on track.

The long-term goal of the program is to increase the number of under-represented scientists in biomedical research. E Ho‘oulu Haumana summarizes our goals as the words essentially mean "the growth of students." The program seeks to provide MHIRT students with the help and encouragement they need as they transition from undergraduate students, to graduate students in the biomedical sciences, to future leaders in biomedical research. Although the students officially complete the program tonight, it doesn’t end here. We will continue to help the students conduct research in Hawai‘i, provide advice on career options, and (of course) write letters of recommendation as MHIRT 2018 students enter the next phase of their career. We are sure everyone will enjoy watching the continued growth of our MHIRT 2018 students.

This year MHIRT students conducted research in Cameroon, Liberia, Laos, India and Thailand. They have wonderful stories to tell. So sit back and enjoy the evening.

The Director

Vivek R. Nerurkar
The Minority Health and Health Disparities International Research Training (MHIRT) program allows U.S. institutions to offer short-term international research training opportunities to undergraduate and graduate students from under-represented backgrounds. Funded by the National Institute of Minority Health and Health Disparities (NIMHD) at the National Institutes of Health (NIH), the MHIRT program is associated with the Department of Tropical Medicine, Medical Microbiology & Pharmacology at the John A. Burns School of Medicine, University of Hawaii at Manoa.

The specific objectives of the program are to encourage students from under-represented backgrounds to pursue career in science and biomedical, clinical, and behavioral health research and also to expose students to global health issues that relate to health disparities. The program also aims to enable collaborations between colleges/universities and international research programs.

Currently, the program offers research sites in Thailand, Cameroon, India, Laos and Liberia. UH has partnered with leading scientists and universities in these countries who serve as research mentors for MHIRT students. Selected students spend 7-8 weeks during the summer at their International training sites under the guidance of their assigned in-country mentor and their UH mentor. Students engage in a variety of international health projects in tropical medicine and infectious diseases. Additionally, the MHIRT program provides the opportunity to share experience with other trainees upon returning to the U.S. and provides supporting opportunities for students to publish their research and/or present their research findings at local and national conferences.
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<td>Introduction</td>
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John Paul Arios (Yaounde, Cameroon)

John Paul (JP) was born and raised in the Philippines until he moved with his family to Hawaii when he was three years old. As an undergrad, JP was fortunate enough to participate in a medical mission in Central America, work at Castle Medical Center as an emergency room scribe, and volunteer with the H.O.M.E. Project to provide free and basic medical care and education to homeless populations across the island. This December, he will be receiving his Bachelor of Arts Degree in Public Health. Prior to MHIRT, he had some research experience within the public health field and this past year, received funding to conduct research in peptide biochemistry under Dr. Jon-Paul Bingham. Next year, he plans to apply for a MD/PhD program and pursue a career as a physician scientist.

Outside of research, others can find JP playing volleyball, eating acai bowls, lifting weights at the gym, or hanging out at the beach with friends.

Research project

Successful Skin Swab Collection from HIV Patients in Cameroon

Abstract: HIV infection causes immune dysfunction in patients, the end stage of which is AIDS. Opportunistic infections in AIDS patients include dermatological conditions such as Kaposi’s sarcoma. However, the relationship between the patient’s skin microbiota and the development of opportunistic skin infections remains to be elucidated. Research to identify this relationship is of great importance to control the progress of AIDS intervention. In Cameroon, HIV infection is one of the leading causes of all deaths and remains an issue despite increased access to antiretroviral therapies. The purpose of this study was to 1) identify a feasible method for skin swab collection in Cameroon, 2) determine the composition of skin microbiota from AIDS patients who have developed Kaposi’s sarcoma, and 3) assess the presence of a dysbiosis due to immune suppression. Skin swabs were collected from HIV negative and HIV positive patients. DNA was isolated from the skin swabs using an enzymatic method. Samples were run through a meta-16S analysis using NGS. Simultaneously, qPCR was run on fungal DNA and total DNA levels were measured. To quantitate HIV viral load and CD4+/CD8+ T cells, a small amount of blood was drawn from the patients. Feasibility of sample collection was verified after PCR and gel electrophoresis. DNA yield varied at each site but qPCR results confirmed that the minimum amount was sufficient for NGS. The forehead provided the most difficulty yielding DNA due to impurities from cosmetic products. Cleaning of all samples prior to PCR improved yield from forehead along with other sites. NGS has not yet been completed but will be analyzed once results are available. The technique used in this study shows promise for further skin microbiome studies in other developing countries in Africa.

Mentors: Dr. Yukie Lloyd (Hawaii) and Dr. Gabriel Loni (Cameroon)
Christine Joy Baltazar (Bangkok, Thailand)

Christine is of Filipino descent born and raised on Oahu. She transferred to UH Manoa from UH West Oahu last year and is majoring in BS Biochemistry and minor in Biology and Philippine Language and Literature. After her undergraduate career, she plans to get her PhD in Toxicology to continue her passion of doing research. Her previous research includes using spectroscopic methods to observe the interaction of mimosine with BSA and DNA, characterizing mitotic gamma-tubulin in two different species of local Hawaiian sea urchin embryos exposed to Bisphenol-A, and characterizing cell division defects and early developmental effects of possible plastic pollution on the west coast of Oahu using *Tripneustes gratilla*. She has worked as a lab assistant at West Oahu under the Math and Science division and currently works as a lab assistant at Manoa. During her free time, she enjoys playing the piano or ukulele, watching Netflix, and spending time with her friends and family.

Research project

Molecular epidemiology of *Burkholderia pseudomallei* isolates in Buriram, Thailand

**Abstract:** Melioidosis is an infectious disease caused by a Gram-negative bacterium *Burkholderia pseudomallei*. Northeast Thailand is an endemic area with 2,000 culture-confirmed melioidosis cases/year with a 40% mortality rate. Human infections can occur from coming in contact with contaminated soil or water in tropical and subtropical regions. Tracking individual clinical cases to the environmental sources of infection is a major gap to understand how patients are infected. In this study, we wanted to compare banding patterns of environmental isolates to a patient specimen and also compare the similarities between patient isolates through the use of pulsed-field gel electrophoresis (PFGE). *B. pseudomallei* was isolated by plating duplicates of 10 and 100 µL of the supernatant from environmental samples and spread onto Ashdown agar plates. Latex agglutination and mass spectrometry tests were conducted on suspected colonies of environmental isolates. PFGE was conducted on 18 environmental isolates and 97 patient isolates in order to compare banding patterns between *B. pseudomallei* isolated from an individual melioidosis case and the environmental sources where the patient was suspected to be exposed. Twenty-six environmental isolates (soil, water, and rhizosphere) were taken from the rice field and around the home of a patient while 97 patient isolates were assayed using PFGE. Latex agglutination and mass spectrometry tests confirmed that five water samples and 2 rhizosphere samples contained *B. pseudomallei* colonies. PFGE tests demonstrated that the patient may not have been infected with *B. pseudomallei* from the rice field while patient isolates did not show the exact same banding patterns.

**Mentors:** Dr. William Gosnell (Hawaii) and Dr. Narisara Chantratita (Thailand)
Kianalei Garalde-Machida (Monrovia, Liberia)

Born and raised in Honolulu, Hawaii, Kianalei Garalde-Machida is a recent graduate of the University of Hawaii with a BS in Biology. She has a passion for both reproductive medicine, as well as infectious disease. Conducting research in Liberia has taught her how to adapt and immerse herself into situations outside of her comfort zone. She toured Dr. Mosoka Fallah’s clinic called the “Refuge Place” in Monrovia gaining first hand insight of what civilians have to go through when feeling under the weather or when giving birth. Kianalei aspires to be a physician providing suitable health care to rural and under-resourced areas in developing countries. She will be applying to medical school next year, and plans to attend an MD/PhD program. When she is not studying or working, she enjoys playing basketball, going to the beach, and hiking.

Research Project

Sero-epidemiology of filovirus-specific antibodies in canines

Abstract: The 2013-2016 outbreak of Ebola virus (EBOV) in several countries in West Africa was the largest reported outbreak to date with more than 28,000 cases and over 11,000 fatalities. More than one third of these cases occurred in Liberia where the virus spread into all counties. The outbreak was unexpected, as previously filoviruses were not considered endemic there, however, all of the fruit bat species considered to be potential filovirus reservoirs have been reported to be present in Liberia. As the host range of filoviruses is not fully known yet and there is a possibility that domesticated animals, such as dogs, have been exposed to EBOV during the outbreak, we conducted serological surveys of dog serum samples to look for evidence of previous infection with EBOV or other filoviruses. These results could drive the knowledge about filovirus epidemiology in Liberia.

Mentors: Dr. Axel Lehrer (Hawaii), Dr. Varney Kamara and Dr. Peter Humphrey (Liberia)
Joana Marcos Garcia (Bangkok, Thailand)

Joana is a first-generation Portuguese, who was raised in San Francisco, California, and is currently completing her Bachelor of Arts in Public Health, as well as her BA in Peace Studies: Health Disparities as a Global Conflict. Joana is planning on going into the Peace Corps before getting her masters in public health, and eventually her Ph.D. in Epidemiology. Specifically, Joana is interested in parasite species, and parasitic infections. She has been working on *Angiostrongylus* spp. since August 2017 with Professors Kramer and Gosnell.

Research project

Morphological characterization and molecular Identification of *Angiostrongylus* spp. in Thailand using the COX1 gene as a marker

Abstract: *Angiostrongylus cantonensis*, the parasitic nematodes, causes human eosinophilic meningitis worldwide including Thailand. *A. cantonensis* is closely related to species named *A. malaysiensis*, which potentially can cause human angiostrongyliasis. Previously, *A. cantonensis* was believed as the major species found in Thailand, but recent molecular identification revealed that *A. cantonensis* and *A. malaysiensis* have overlapping distribution in many parts of Thailand. Because these two species are very similar in their morphology, misidentification is a major concern. Therefore, this study aimed to carefully identify *Angiostrongylus* adult worms, collected from rodents in Thailand, using morphological characteristics and confirm the species by molecular identification. Twenty-eight worms were morphologically identified and polymerase chain reaction (PCR) was conducted using mitochondrial cytochrome c oxidase subunit 1 (COX1) gene as the molecular marker. However, only seven samples could be amplified by PCR and DNA sequences were obtained from all seven samples. Five samples were *A. cantonensis* and two samples were *A. malaysiensis*. Further studies are warranted to investigate the prevalence and evidence of co-infection of these two species from rodents in Thailand.

Mentors: Dr. William Gosnell and Dr. Kenton Kramer (Hawaii), Dr. Paron Dekumyoy (Thailand)
Kenneth Go (Chiang Mai, Thailand)

Born and raised on the island of Oahu, Kenneth is currently a senior undergraduate at the University of Hawai‘i at Mānoa pursuing a B.A. in English with Honors and a minor in Biology. He is of Filipino and Chinese descent. Although Kenneth aspires to be an allopathic physician serving the local community, his academic interests includes competitive debate and the intersection between English and science. During this upcoming school year, he will be conducting research on the language of science by primarily analyzing Charles Darwin’s On the Origin of Species through a rhetorical lens. Whenever Kenneth is not studying, sleeping, or working, he enjoys trying new things. He recently learned how to surf and skateboard! Although debate has taken him to the Netherlands, Mexico, Canada, and all across the US, his experiences in Chiang Mai are the ones he values the most. For that, he is eternally grateful for MHIRT.

Research project

Expression of extracellular lipase and protease activities in pathogenic mycelial phase of Malassezia species

Abstract: Malassezia spp are lipophilic yeasts that are frequent components of the skin microflora of humans and most warm-blooded animals. In some conditions, Malassezia spp can cause several skin diseases, such as pityriasis versicolor, dandruff and seborrhoeic dermatitis. They are categorized as dimorphic fungi as they can change morphology from yeast cells to mycelial forms during infection. Thus, the production of mycelial stage of Malassezia spp is believed to be associated with virulence. In addition, the attributes of Malassezia spp implicated in pathogenesis include lipolytic enzymes that injure host tissues and provide nutrients for the fungi. Thus, the purpose of this work is to investigate the induction of hyphal growth of Malassezia spp in vitro and then compare extracellular enzymatic activities, lipase and protease enzymes, between strains of Malassezia spp. This study will contribute to a better understanding of an invasive ability of the hyphal form of Malassezia spp.

Mentors: Dr. Sandra Chang (Hawaii) and Dr. Sirida Youngchim (Thailand)
Boonyanudh is a first-generation Thai-American born and raised in Los Angeles, California. She received her Bachelor of Science in Molecular and Cell Biology from the University of Hawaii at Manoa this past spring. She has three years of research experience prior to participating in the MHIRT program. She was an IDeA Networks of Biomedical Research Excellence (INBRE) and The Undergraduate Research Opportunities Program (UROP) funded student while working under Dr. Verma as an undergraduate studying the testicular pathogenesis of Zika virus. She will be continuing her work as a graduate student under Dr. Verma this fall. Outside of the lab and academics, Boonya enjoys reliving her past as a collegiate athlete by occasionally playing both indoor and outdoor volleyball. She also finds time to relax through yoga, and playing with her cat, Mason. She is also a wine enthusiast and plan to be a sommelier one day.

Research Project

Presence of *Plasmodium* Species Mixed Infections from Asymptomatic Children in Cameroon

Abstract: Malaria is a disease caused by an infection with a parasite called *Plasmodium*. In Cameroon, located in central Africa, *Plasmodium falciparum* is the predominant species that is known to cause symptomatic malaria. However, evidence points to the presence of other *Plasmodium* species in Cameroon, including *P. vivax*, *P. ovale*, and *P. malariae*, that could be found in asymptomatic individuals. The purpose of this study was to identify the *Plasmodium* species in asymptomatic children residing in the Centre Region (Ngali II) of Cameroon. Archival blood samples collected in 2017 from 106 asymptomatic children (newborn to 15 years) were used in this study. DNA was extracted using the NucleoSpin column DNA extraction kit. Identification of the *Plasmodium* species was performed using nested polymerase chain reaction (nPCR) with the mito *cox3* primers. Visualization of the nPCR product was done by gel electrophoresis. The PCR prevalence of *Plasmodium* infection was 62% (n=66/106). Mixed species infections of *P. falciparum*, *P. ovale*, and *P. malariae* was 10% (n=11/106). Infection of two species, *P. falciparum* and *P. malariae* was 25% (n=27/106) and *P. falciparum* and *P. ovale* was 6% (n=7/106). Single species infection of *P. falciparum* was 18% (n=19/106) and *P. malariae* was 2% (n=2/106). *P. vivax* was not detected in the samples. *P. falciparum* was not the only species that was present in the asymptomatic samples. However, most *P. malariae* infections and all *P. ovale* infections were mixed infections with *P. falciparum*. Further studies need to confirm the dynamics of mixed infections in symptomatic and asymptomatic children from the same location. This study confirmed for the first time the prevalence of *P. malariae* and *P. ovale* in the Centre Region (Ngali II) of Cameroon. The information obtained from this study can be used to advise malaria control policies and programs.

Mentors: Dr. Diane Taylor (Hawaii) and Livo Esemu (Cameroon)
Landon Negrillo (New Delhi, India)

Landon is a senior undergraduate student at the University of Hawaii at Manoa from Kauai. He is pursuing a BA double-major in Communications and Biology in hopes that it will allow him to become an effective Researcher and a Science Communicator in the future. His approach to science comes from his father and the TV shows that he grew up with. As a chef and the household handyman, his father shared with Landon the passion to learn by understanding things done with his own hands and to “think smarter, not harder” to solve problems. Growing up he was further inspired to pursue science by shows like Zoom, Good Eats with Alton Brown, and Mythbusters; all programs that show the practicality of science in everyday life. Landon has a deep appreciation for nature and the sights around him. He likes to captures it all through one of his many hobbies, Photography. His other hobbies include hip-hop dancing, cooking, and spending time with friends. Landon deeply appreciates the MHIRT program for granting him the opportunity to travel and providing him with a great research experience.

Research project

Gut Microbiota May Contribute to the Elevated Inflammation In Perinatally HIV-Infected Children Despite Treatment.

Abstract: Due to advent of antiretroviral therapy (ART), HIV infection has become a chronic disease with undetectable viral load and reduced mortality. Mother-to-child transmission (MTCT) has also reduced to less than 1%. However, perinatal HIV infection remains a problem, mainly in the developing countries. While ART is effective in controlling the HIV viral load, non-AIDS morbidities are very common and affect the quality of life among HIV-infected children. While several factors might affect the prevalence of non-AIDS morbidity among children, chronic inflammation appears to play a major role. We hypothesized that altered gut microbiota in perinatally HIV-infected subjects derive inflammation despite the treatment. Using C. elegans as a model, we showed that microbiota derived from the fecal samples of untreated and treated HIV-infected children reduce the expression level of the tight-junction protein (clc-1) compared to that of HIV negative controls. This might facilitate the microbial translocation and form “leaky gut”. Microbiome derived from untreated HIV-infected children elicited ~5 times higher expression of IL-1β in differentiated THP-1 cells, compared to that derived from healthy control. ART appears to normalize the IL-1β-stimulating property of microbiota on THP-1, however it retains the ability to disrupt tight junction protein expression. Our pilot study opens the door to comprehensively study the crosstalk between gut microbiota and gut epithelial tight junction proteins in the setting of perinatal HIV infection and finding mechanism of elevated inflammation and non-AIDS morbidities.

Mentors: Dr. Mukesh Kumar (Hawaii), Dr. Ravi Tandon and Dr. Ashwini Kumar Ray (India)
Alison Nguyen (Chiang Mai, Thailand)

Alison was born in Honolulu, Hawaii and is currently a senior at the University of Hawaii at Manoa. She is currently pursuing a B.S. in Chemistry. Alison has not had any prior research experience, however, she plans to continue researching in the chemistry department. Alison has a love and appreciation for science and hopes that she can make an impact with the knowledge she has acquired. In the future, she hopes to either pursue a future in pharmacy or work in a clinical laboratory. In her free time, she enjoys bowling with her friends, taking long drives or going to the beach.

Research project

Development of Analysis Software For Quality Control of Magnetic Resonance Imaging (MRI) System.

Abstract: The accuracy of magnetic resonance imaging (MRI) is dependent on a series of tests set forth by the American College of Radiology (ACR). This aspect of the MRI system is called quality control. Quality control ensures that the MR scanner is operating efficiently and that high-quality images are produced. Quality control tests are performed weekly and require a trained technician. The analysis required for the quality control tests are cumbersome and time-consuming. This study aims to create an automated analysis software that will increase the efficiency of the testing process. An automated analysis software will be able to consistently perform the weekly quality control test. This project specifically will focus on determining the cutoff contrast of a simulated high contrast ACR phantom scan data from volunteers. A user interface was built using MATLAB V.2018a to assist the participants in navigating the simulation. The success of the analysis software means that quality control tests will be much quicker, and error created by human variability will be eliminated.

Mentors: Dr. Napapon Sailasuta (Hawaii) and Dr. Suwit Saekho (Thailand)
Jenny Nguyen (Bangkok, Thailand)

Jenny was born in Vietnam and moved to Hawaii when she was three years old. She is currently going into her third year of studying Biochemistry on the pre-medical track at the University of Hawaii at Manoa. After undergraduate school, she hopes to eventually get into the John A. Burns School of Medicine and pursue her interest in Oncology. She has dreamed of becoming a physician for as long as she can remember, but that dream became a career goal when she lost her grandmother in middle school. Before the MHIRT Program, Jenny had little to no research experience but she feels extremely blessed to have been able to gain more research experience in Thailand. During her free time, Jenny loves to catch up on sleep, eat, go hiking, swim at the beach, and spend quality time with her family as well as friends. As a first generation Vietnamese-American and college student, Jenny is determined to make her family proud and help others through the art of medicine.

Research project

Preferences for PrEP Service Delivery of MSM and TGW from Community-Based Centers in Thailand

Abstract: HIV is a global issue that remains to be a major health concern in Thailand specifically for key populations being inhibited from accessing the HIV services needed due to discrimination, marginalization, and stigmatization. As prevention is an important aspect within the HIV treatment cascade, PrEP is an effective daily medication that combines two HIV medicines in order to prevent infection. Differentiated care, a patient-centered method that decreases the burden on the health system, is applied by providing PrEP in community-based organizations (CBOs) in addition to regular health care facilities. This project used a questionnaire to determine PrEP attitudes and concerns in order to look at location preferences for PrEP services among MSM and TGW. Out of 359 CBO clients who were enrolled in a Test-and-Treat project and consented to the sub-study, 265 (73.8%) preferred to receive PrEP at CBOs and 94 (26.2%) preferred other facilities. It was found that participants who preferred CBOs were more likely to have less than a bachelor degree and to be unemployed, a student, or a service worker. They were also less embarrassed to take PrEP and less anxious about taking PrEP compared to those who preferred other facilities. When it comes to barriers to taking PrEP, those who preferred CBOs were more concerned about forgetting to take medicines while those who preferred other facilities were more likely to report being afraid of family finding out. Furthermore, MSM and TGW who preferred PrEP services from CBOs based their preference on the standard of services, and the availability of helpful as well as friendly staff. These results will help in further adapting PrEP services to the needs of MSM and TGW at risk of HIV infection, and aid the efficient implementation of PrEP services in Thailand.

Mentors: Dr. Angela Sy (Hawaii) and Dr. Reshmie Ramautarsing (Thailand)
Annalyn Oliveros (Luang Prabang, Laos)

Anna was born in Laoag City, Philippines and came to Hawai’i when she was just 6 months old. She is the first generation in her family to attend college. She received her degree in Public Health from the University of Hawai’i at Manoa last semester. Her ultimate goal is to attend medical school and work as a physician in underrepresented areas in Hawai’i. Prior to MHIRT, Anna worked as an E.R. medical scribe manager at Castle Medical Center and Wahiawa General Hospital and babysat the children of E.R. physicians. After MHIRT, she plans to continue scribing and babysitting as she waits to hear back from medical schools she applied for. She also volunteered in the physical and occupational therapy area of Shriner’s Hospital for Children. In terms of research background, she assisted Charlene Cuaresma with Asian American Network for Cancer Awareness, Research and Training in identifying the barriers to colorectal and breast cancer screening in Filipino-Americans in Hawai’i. Aside from work, Anna enjoys spending quality time with family and friends, especially her two nephews. Her research in Laos has sparked her interest in Global Health and she hopes to make an impact in the future.

Research project

Evaluation of a novel pediatric nutrition consultation service in Lao PDR

Abstract: Malnutrition, in all of its forms, contributes to 45% of under-5 mortality among children worldwide. Undernutrition, specifically, carries an increased risk of short-term mortality and contributes to poor outcomes among children with acute illnesses. In resource-limited settings, specific nutritional care for hospitalized patients is rarely provided. At Lao Friends Hospital for Children, a nutritional consultation service has been established. The consult service provides seven-days-a-week consultation for all children admitted to the hospital and for any outpatients requested. This is the first such service in Laos and serves as a model for the type of service that can be provided in resource-limited hospitals worldwide. A retrospective chart review was done on nearly 1,000 inpatients that were seen over seven months. The goal of this study was to analyze the types of patients seen, anthropometric measures, diagnoses rendered, treatments provided, and clinical outcomes achieved. The management of patients with severe acute malnutrition (SAM) was specifically evaluated in detailed and showed that the majority of children with SAM were not cured due to leaving against medical advice before treatment was complete. This work demonstrates that the addition of a nutrition consultation service can be successfully incorporated into routine care in an acute care children’s hospital in a resource-limited environment, even as addressing the nutritional care for hospitalized children requires significant resources and buy-in from local staff and patient families.

Mentors: Dr. Kenton Kramer (Hawaii) and Dr. Indi Trehan (Laos)
Jasmine Padamada (Bangkok, Thailand)

Jasmine was born and raised on the Big Island of Hawaii, but she moved to Oahu three years ago in pursuit of a higher education. She is currently an incoming senior at the University of Hawaii at Mānoa majoring in Biochemistry. Her interest in research started when she worked as a summer intern at the University of Hawaii Cancer Center. After her undergraduate studies, she plans to continue her education by pursuing a master’s degree in Cell and Molecular Biology, Microbiology, or Tropical Medicine. After that, she hopes to become a physician specializing in pediatrics and oncology. During her free time, she likes to watch movies, hike, and spend time with friends.

Research project

Molecular Evolution and Phylogeny of Zika Viruses in Thailand

Abstract: Zika is a mosquito-borne RNA virus that was discovered in 1945 in Uganda. In 2016, the World Health Organization declared ZIKV infection to be a Public Health Emergency of International Concern due to its quick spread around the world and its ability to cause neurological diseases. A previous study examined the spread of ZIKV in Thailand, which is believed to have originated in 2012. However, there is a gap in knowledge on the epidemiology of ZIKV in Thailand. The purpose of this study is to create a phylogenetic tree of 39 positive ZIKV samples from Bangkok. As a part of a larger study, these sequences will be compared to samples found in the Phetchabun province. The hypothesis is that the ZIKV sequences found between the two provinces will be similar. This retrospective study uses 39 samples collected from in-patients at the Hospital for Tropical Diseases in Bangkok, from 2016-2018. These patients were already confirmed to be infected with ZIKV via quantitative reverse-transcription PCR (qRT-PCR) assays using the RealStar® Zika Virus RT-PCR kit. The viral RNA was extracted from the urine, cDNA was synthesized, amplified using PCR, purified using gel extraction, and sequenced. Out of the 39 samples, seven were sequenced for the envelope gene. Six out of the seven sequences were very similar to each other and to ZIKV strains from Singapore. We identified specific mutations in the ZIKV strains from Thailand. This data provides important information about how the virus originated, evolved, adapted, and spread. This in turn will aid in the prevention of future outbreaks.

Mentors: Dr. Vivek R. Nerurkar (Hawaii) and Dr. Pornsawan Leaungwutiwong (Thailand)
Melissa Takaaze (Monrovia, Liberia)

Melissa was born on the Big Island of Hawai‘i and grew up in rural Hawai‘i and Alaska. She has a B.A. and M.A. in Political Science from the University of Hawai‘i at Manoa and is currently completing an A.S. in Biological Sciences at Kapi‘olani Community College. Since childhood she has been fascinated by bacteria and viruses, and thus was thrilled to learn about the morphology and virulence factors of these microorganisms in Microbiology class and lab. In addition, she was ecstatic to grow and study *Campylobactor jejuni* bacteria as an INBRE student researcher under the guidance of Dr. John Berestecky. Melissa also works as an instructor of Political Science at KCC and has her own consulting company. In her free time, she enjoys traveling independently, volunteering, experimenting with various cooking techniques and flavor combinations, and learning about infectious diseases.

Research project

**Sero-epidemiology of Lassa virus-specific antibodies in canines**

Lassa virus (LASV) is a rodent-borne arenavirus causing between 300,000-500,000 infections annually in Western Africa. A significant portion of these cases occurs in Liberia. As domesticated animals, such as dogs, may come into contact with excretions of the *Mastomys natalensis* (reservoir species), or potentially capture and consume infected animals, a question about the role of canines as LASV indicators or even transmitters arises. As of August 2018, no information about the seroprevalence of LASV antigens in canines is available, thus this study could provide novel information about the epidemiology of LASV in an endemic area. Blood was drawn and serum was separated from 64 domesticated dogs from seven communities in Montserrado, Liberia’s most populated county. Serum was tested for antibodies against LASV-glycoprotein (GP) antigen using Luminex-based microsphere immunoassays. We were able to identify three dogs from two communities that demonstrated an antibody response to LASV-GP antigen. Overall, our research shows that domestic dogs in Montserrado County have a low prevalence of antibodies against LASV-GP, which may suggest minimal or low exposure to the virus in this specific region. This data is a promising step towards better understanding LASV seroprevalence and highlights the need for additional research in order to more effectively gauge, assess, and compare ranges of LASV seroprevalence in canine populations throughout Liberia, particularly in rural areas where *M. natalensis* is likely to be more abundant.

**Mentors:** Dr. John Berestecky (Hawaii) and Dr. Varney Kamara and Ayesha Euris Regina Bell-Gam Woto (Liberia)
John Berestecky, Ph.D.

Dr. Berestecky is a Professor of Microbiology at Kapiolani Community College where he has taught microbiology, immunology and cell biology since 1989. He has a broad background in immunochemistry and cellular immunology with approximately 30 years of experience making and researching polyclonal and monoclonal antibodies. His other research interest is in investigating the molecular determinants of pathogenesis in bacterial/eukaryotic systems, specifically studying the attachment and invasion of *Campylobacter jejuni* onto and into various human cells in tissue culture. Since his days as a Peace Corps Volunteer microbiologist in Liberia he has had an abiding personal and professional interest in West Africa. In the 1980’s he helped to develop clinical laboratories for tuberculosis diagnosis in Liberia. Over the past several years he has worked closely with the University of Liberia Biology and Chemistry Departments to redesign the undergraduate BSc curricula for these departments as part of a USAID supported project that also included the creation of new undergraduate biology teaching labs and programs for faculty training and development.

Sandra Chang, Ph.D.

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 metabolic 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.

William Gosnell, Ph.D.

Dr. Gosnell is an Assistant Professor in the Department of Tropical Medicine, Medical Microbiology and Pharmacology at JABSOM, University of Hawaii at Mānoa. Dr. Gosnell is a trained parasitologist and immunologist with expertise in the studies of the immunologic response to human infectious diseases particularly related to host-parasite interactions associated with immunity to disease and its implications for diagnostic and treatment modalities. Dr. Gosnell conducts teaching, training and mentoring of undergraduate, graduate and medical students for the Department.
Pakieli Kaufusi, Ph.D.

Dr. Pakieli H. Kaufusi joined the University of Hawaii at Manoa in 2004 as an investigator in the Department of Tropical Medicine, Medical Microbiology and Pharmacology at John A. Burns School of Medicine. His research interests include investigating the molecular aspect of vector-borne diseases. He is currently employing molecular tools to delineate the role of viral proteins in flavivirus pathogenesis, and some of these proteins may serve as targets for anti-flavivirus drug discovery.

Kenton Kramer, Ph.D.

Dr. Kramer is an Associate Professor in the Department of Tropical Medicine, Medical Microbiology and Pharmacology at the John A Burns School of Medicine, University of Hawaii at Manoa. Dr. Kramer is a medical parasitologist with an interest in parasites of medical importance in Hawaii and the Pacific Basin. Dr. Kramer is involved in teaching and training of undergraduate, graduate and medical students. His outreach interest is the prevention foodborne illnesses by attending local farmers markets.

Mukesh Kumar, B.V.Sc. & A.H., M.S., Ph.D.

Dr. Kumar is an Assistant Professor in the Department of Tropical Medicine, Medical Microbiology and Pharmacology, and Associate Director of the John A. Burns School of Medicine (JABSOM) Biocontainment Facility at JABSOM, University of Hawaii at Manoa. Dr. Kumar is a veterinarian and a trained virologist and immunologist with expertise in the studies of virus-host interactions and innate immunity. Dr. Kumar conducts teaching, training and mentoring of students and staff in the Department and conducts research on the pathogenesis of arboviruses and polyomaviruses. In addition to conducting instructional duties and research, as Associate Director, Dr. Kumar manages the (JABSOM) Biocontainment Facility.
Axel Lehrer, Ph.D.

Dr. Lehrer is an Assistant Professor in the Department of Tropical Medicine, Medical Microbiology and Pharmacology, and is a Biochemist with training and experience in molecular biology, virology and immunology. For over ten years, he worked in the Biotech industry mainly on the development of recombinant subunit vaccines against infectious diseases. Dr. Lehrer's laboratory currently mainly focuses on the preclinical development of a recombinant subunit filovirus vaccine. Associated with this project, he is interested in the development of assays to analyze cellular and humoral immune responses against vaccines and natural filovirus infections with a particular focus on defining correlates of protection. Furthermore, he is trying to identify and characterize the roles of various filoviral proteins on induction of severe disease.

Yukie Lloyd, M.S.

Ms. Lloyd recently received her PhD in the Department of Tropical Medicine at JABSOM, investigating the biological functions of antibodies to malaria antigens and its implications in vaccine development. She worked in a virology lab under Dr. Wei-Kung Wang for her M.S. degree, focusing on a novel vaccine candidate for dengue virus. In 2014, she joined Dr. Diane Taylor’s lab to work on the immune response to malaria in pregnant women. As a recipient of the Soroptimist Founder Region Fellowship and the Chancellor Virginia S. Hinshaw Biomedical Research Scholarship, she is conducting field research in collaboration with the University of Yaounde I in Cameroon, West Africa.

Vivek R. Nerurkar, D.M.L.T, M.Sc., Ph.D.

Dr. Nerurkar is a Professor and Chair of the Department of Tropical Medicine, Medical Microbiology and Pharmacology at John A. Burns School of Medicine. He joined the University of Hawaii at Manoa in 1994 to develop the Research Centers in Minority Institutions Program, NCRR 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 three decades he has conducted research in the diverse but related areas of virology, specifically neurovirology.
Napapon Sailasuta, Ph.D.

Dr. Sailasuta's research focuses on looking into HIV and addicts' brain processes using non-invasive magnetic resonance imaging and spectroscopy. Dr. Sailasuta is a physicist who developed numerous MRI/MRS methods for translational study in human brain. Dr. Sailasuta worked in healthcare industry for more than 15 years as research and development scientist and joined the Department of Tropical Medicine in 2013 as Associate Professor.

Angela Sy, DrPh

Dr. Sy conducts research on cancer disparities among Asian and Pacific Islander communities with a focus on colorectal cancer prevention, community engaged research and program evaluation. She works with communities represented by the U.S. Affiliated Pacific Islands: Republic of Marshall Islands, Federated States of Micronesia, Guam, Commonwealth of Northern Mariana Islands, and Republic of Palau. She examines the socio-cultural barriers to and facilitators of participating in cancer prevention programs. She conducts community engaged research using socio ecological frameworks to impact change at individual social, and policy, systems and environment levels, often requiring multi-disciplinary collaborations.

Diane W. Taylor, Ph.D.

Dr. Taylor’s primary research is on malarial immunity, including identification of immune responses associated with protection and pathology. Early studies examined cellular and humoral immune responses to malaria using rodent and primate models. These studies lead to producing monoclonal antibodies (mAb) against Plasmodium falciparum, the parasite that causes human malaria. Since 1990 she has conducted research and training of graduate and doctoral students in Cameroon, receiving continued NIH support since 1994. More recently, Dr. Taylor began evaluating how malaria infections during pregnancy influence acquisition of immunity of their babies to malaria during the first year of life.
Ayesha Euris Regina Bell-Gam Woto, M.Sc.

Dr. Woto is a Lecturer at the University of Liberia (UL), Biological Sciences Department. She is the Coordinator/Director of the Medical Science pathway at the UL. She teaches principal disciplines of Clinical Laboratory: Hematology, Immunology, Medical Microbiology, Medical Biochemistry, Epidemiology, Medical Parasitology, Biostatistics, Genetics and Genomics. She was awarded BSc (Hons) from University of Hull, UK in Biomedical Sciences, Division of Cardiovascular and Respiratory studies. She is licensed by The Postgraduate Medical Institute of the University of Hull in association with the Hull York Medical School, Hull, UK. She has worked as a clinical scientist in Egypt and was a WHO intern at The Noguchi Memorial Medical Research Institute, Accra, Ghana.

Kittipong Chaisiri, Ph.D.

Dr. Chaisiri is an Associate Professor in the Department of Helminthology, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand. He received his Ph.D in Infection and Global Health from the University of Liverpool, UK. His primary research interests are in the field of ecological health, “One health” research theme focusing at the influence of biodiversity, e.g., hosts and parasite diversity in regarding to environmental changes and how this affect either human or animal health.

Narisara Chantratita, Ph.D.

Dr. Narisara is an Associate Professor at Mahidol University in Bangkok, Thailand. She received her Ph.D. in Tropical Medicine from Mahidol University in 2006. She has studied the interactions between the pathogen and human host in melioidosis for over twenty years, combining laboratory investigation with clinical studies. Based in the Department of Microbiology and Immunology, Faculty of Tropical Medicine at Mahidol University in Bangkok, she is affiliated with the Mahidol-Oxford Tropical Medicine Research Unit as a senior scientist. She has conducted or been involved in numerous studies relating to melioidosis in northeast Thailand. She has developed a substantial repertoire of expertise in cellular and molecular immunology, bacteriology, molecular diagnostics, and bacterial and host genetics pertaining to melioidosis.
Siriporn Chon, M.S.

Ms. Siriporn joined the Department of Microbiology, Faculty of Medicine at Chiang Mai University as a Medical Technologist and Research Assistant in 2004. Her work expertise includes medical mycology identification, diagnosis for fungal keratitis and diagnosis for pythiosis. Her current research is on the fungal corneal infection. She is also involved in several projects in the laboratory which include Medical Mycology and Bacteriology.

Diana Culbertson PA-C, MMSc, MS

Diana earned her MS in Nutrition from Colorado State University in 2010 and completed her Physician Assistant studies at Emory University in 2014. She has coordinated research for studies involving obesity prevention in children, breast feeding, complementary diets and malnutrition. As a PA she has worked as part of the Ebola Response effort in Liberia, as a clinician in Pediatric Endocrinology at Washington University in St Louis, and as a clinician with Partners in Health Liberia focusing on malnutrition and non-communicable disease. She is currently based in Laos where she is a clinical mentor and the Nutrition Coordinator at Lao Friends Hospital for Children.

Paron Dekumyoy, Ph.D.

Dr. Paron is currently the Head of the Department of Helminthology, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand. He received his Ph.D from Mahidol University in the Faculty of Tropical Medicine. Dr. Paron’s current research is focused on IgG4 as the best immunoglobulin for the diagnosis of sparganosis, as well as the analysis of a Paragonimus heterotremus specific antigen prepared by cDNA cloning for serodiagnosis of human paragonimiasis in Thailand. Dr. Paron’s overall research is studying the host immune response to helminthic infections and the improvement of diagnosis of helminthic infections.
Livo Forgu Esemu

Mr. Esemu is a Ph.D. candidate at the University of Yaounde I (UYI), Cameroon. He studies under the supervision of Professors Rose Leke and Jude Bigoga at the Biotechnology Center Nkolbisson of the UY1. For his M.Sc. project, he investigated the genetic diversity of a malaria vaccine candidate antigen across different geographical locations in Cameroon. As an awardee of the HIV research Trust grant and the Northern Pacific Global Health Scholarship, he is unravelling changes in the gene expression and microRNA levels in the placenta of HIV-positive and malaria-positive women for his PhD research. Mr. Esemu is also interested in contributing to the elimination of malaria by developing more sensitive, cost effective diagnostic methods. Having lived and studied in Hawaii for six months, Mr. Esemu is familiar with working in different environments and has supervised MHIRT students in the past.

Mosoka P. Fallah, Ph.D., M.P.H., M.A.

Dr. Fallah is a public health consultant and serves as the Deputy Director for Technical Services at the National Public Health Institute of Liberia (NPHIL). In that capacity, he provides supervision for the Divisions of Epidemiology and Infectious Disease, Public Health bundled at the National Reference Laboratory (NRL), comparable to be Liberia’s CDC, as well as Medical Research, Public Health Diagnostics which includes the Liberia Institute for Biomedical Research (LIBR) – similar to an intramural CDC or NIH laboratory. He also is one of the PI’s at PREVAIL, the largest Cohort study on Ebola Survivors in Liberia. During the Ebola crisis in Liberia he served as the Head of Case Detection in the Montserrado Incident Management System administering critical aspects of Liberia’s Ebola response. Dr. Fallah provides training for surveillance, contact tracing, case management, and community mobilization. Recently he was appointed as a Visiting Scientist in the Department of Global Health and Population at the Harvard School of Public Health.
Peter Humphrey, Ph.D.

Dr. Humphrey is Dean of the T.J.R. Faulkner College of Science and Technology, University of Liberia (UL). He teaches undergraduate courses in the Department and in Pharmaceutical Biochemistry at the School of Pharmacy. After receiving a BSc (Honours) in Medical Biochemistry (Univ. of London), a Master of Research in Cell Physiology and Pharmacology (Univ. of Leicester), a MSc in Distributed Information Systems (Brunel), and PhD in Molecular Biology (Univ. of Hertfordshire), he returned home to the UL, and is Life Sciences Biology Specialist in the Center for Excellence in Health and Life Sciences Program, where he is responsible for developing and updating syllabi for courses, organizing workshops, and faculty training sessions. He mentors other faculty members in the development of lesson plans, subject knowledge enhancement, new information, skills and teaching methodologies.

Varney M. Kamara, M.Sc.

Mr. Kamara is Director of the Central Veterinary Diagnostic Laboratory for the Liberian Ministry of Agriculture and a biological sciences lecturer at the University of Liberia. He received his M.Sc. degree in Microbiology and Biochemistry from Punjab Agricultural University in Ludhiana, India, in 2015. He is also coordinator of the Laboratory Technical Working Group under the One Health Platform where he serves as both an epidemiologist and diagnostician. In 2017, Mr. Kamara completed a Veterinary Technology program at the National Institute of Animal Health in Tsukuba, Japan, where he focused primarily on the epidemiology of the porcine reproductive and respiratory syndrome virus (PRRS). With his background in veterinary science and microbiology, Mr. Kamara plays a critical role in the investigation, quarantine, examination, and national reporting of suspected rabies cases in Liberia. In May 2018, he was pivotal in discovering Liberia’s first confirmed case of detected rabies virus in dog brain tissue.

Angkana Lailam, B.Sc.

Ms. Lailam received her Bachelor’s degree of science in Microbiology and Parasitology from University of Phayao, Phayao, Thailand. She joined the Department of Microbiology Faculty of Medicine, Chiang Mai University as a research assistant in mycology laboratory. Her research focuses on fastidious fungal culture and animal cell line tissue culture. She is also implicated in projects of fungal melanization, pathogenesis of Talaromyces (Penicillium) marneffei and skin infection caused by Malassezia species.
Porlsawan Leaungwutiwong, Ph.D.

Dr. Porlsawan is a Head Department of Microbiology and Immunology, Faculty of Tropical Medicine at Mahidol University. She has a broad background on molecular diagnosis of viral infections as well as virus isolation. She has screened samples for Zika virus (ZIKV) as part of our ongoing diagnostic laboratory capabilities and a research work of her M.Sc. student. Currently, Dr Porlsawan and her students have been working on many project including antibody-dependent enhancement (ADE) phenomenon and related chemokines in clinical specimens and genotype distribution of dengue virus in Thailand. Other research projects include a study on the mechanisms of vascular leakage in dengue hemorrhagic fever, production of rapid diagnostic test kit for chikungunya virus (CHIKV) infection and the prevalence of ZIKV and CHIKV in dengue-like syndrome in Thai children. She is involved in multiple collaborations, including institutes for international research collaboration on dengue virus, CHIKV and ZIKV which are University of Munster and Bernhard-Nocht-Institute for Tropical Medicine, Germany and Research Institute for Microbial Diseases, Osaka University, Japan.

Rose Leke, Ph.D.

Professor Leke is known internationally for her research on malaria in pregnant women and is a strong advocate for increasing health care for women and newborns. In 2001, Dr. Leke was honored nationally by the First Lady of Cameroon as one of the three most important women in science in Cameroon since independence; in 2011 she received the Kwanah Nkrumah Scientific Award for women by the African Union; and last year was awarded a Ph.D. Honoris Causa from the University of Ghana. Prof. Leke served tirelessly since 1999 to present as a member of the Global Commission for the Certification of Eradication of Poliomyelitis. She hopes to see polio eradicated in her lifetime.
Gabriel Loni, M.D., MPH

Dr. Gabriel Loni Ekali is a senior program manager at the National AIDS Control Committee of Cameroon and currently coordinates the PEPFAR program in that institution. He is also a research fellow at the Biotechnology Center, University of Yaounde I. Dr. Ekali received his MD from the University of Yaounde I and MPH from the Catholic University of Central Africa. He has been involved in research on diabetes, HIV, and malaria. His current research focuses on how in utero exposure to HIV and antiretroviral drugs affect health of newborns later in life. He is currently investigating the impact of in utero HIV exposure on immunity to malaria vaccine candidate antigens in Cameroonian children.

Kritsada Pruksaphon, M.S.

Mr. Pruksaphon received his masters degree in microbiology from Chiang Mai University, Chiang Mai, Thailand. He also works as the microbiologist of the Department of Microbiology at the Faculty of Medicine, Chiang Mai University. He has developed his research interests focusing on clinical immunology and clinical microbiology for neglected tropical diseases such as rapid immunodiagnostic kits for systemic mycosis Talaromyces (Penicilliosis) marneffei and novel method in fields of antivenom against medically important venomous snakes.

Reshmie Ramautarsing, M.D., Ph.D.

Dr. Ramautarsing earned her medical degree with honors from Erasmus University Rotterdam, The Netherlands, in 2009. From 2009-2013, she conducted her PhD research at the Amsterdam Institute for Global Health and Development at the HIV Netherlands Australia Thailand (HIV-NAT) Research Collaboration in Bangkok, Thailand and her work focused on the bioequivalence, safety and efficacy of generic antiretroviral medication and on the epidemiology of human papillomavirus (HPV) in the cervical and anal compartment of HIV-infected women in Thailand. She is currently a research physician at the Prevention Department of the Thai Red Cross AIDS Research Centre in Bangkok, Thailand, where she provides HIV clinical care and helps develop Differentiated Service Delivery models integrated with Community Led Health Services for HIV treatment and prevention services. Her research focuses on the implementation of these models, as well on HIV prevention strategies for key populations, including men who have sex with men and transgender women.
Ashwini Kumar Ray, Ph.D.

Dr. Ray is a NPGH Fogarty Fellow in the School of Biotechnology, Jawaharlal Nehru University (JNU) New Delhi, India. Dr. Ray has earned his Ph.D. in Molecular Biology from School of Environmental Sciences JNU in 2016. He is a Fogarty Fellow under mentorship of Professor Rupesh Chaturvedi, Dr. Ravi Tandon and Dr. Saguna Verma in School of Biotechnology, JNU, New Delhi, India and working on “Deciphering mechanism of gut microbiota driven cardiometabolic disorder using C. elegans as an animal model”. He is passionate about teaching and research and Fogarty fellowship has given a wonderful opportunity to grow as an independent mentor for M.Sc. and Ph.D. students for his future career.

Suwit Saekho, Ph.D.

Dr. Saekho received his Master's degree in Medical Physics from East Carolina University, NC, USA in 2000 and Ph.D. in Bioengineering from the University of Pittsburgh, PA, USA in 2004. Currently, he is a faculty at the department of Radiological Technology, Faculty of Associated Medical Science, Chiang Mai University, Thailand. His second appointment is an administrative board at the Biomedical Engineering Center, Faculty of Engineering, Chiang Mai University. His research experience involves RF pulse design in MRI. His ongoing research includes measurement of cardiac iron overload using T2* from MRI, and MRI/MRS in HIV/Drug abusers.

Natnaree Saiprom, M.Sc.

Ms. Natnaree is a Research Assistant at the Department of Microbiology and Immunology in Faculty of Tropical Medicine of Mahidol University since 2006. Her research involves detection of Burkholderia pseudomallei by using the molecular biology techniques.
International Mentors

Pakornswit Sathongdejwisit

Mr. Pakornswit graduated from the Faculty of science, Chiang Mai University in Thailand. He is currently studying Medical Microbiology at Faculty of Medicine, Chiang Mai University. His research is focused on the rapid diagnosis of fungal pathogens.

Rathanin Seng

Mr. Rathanin Seng is a PhD student at Faculty of Tropical Medicine, Mahidol University, Thailand from Cambodia. He obtained his master’s degree in Microbiology from Naresuan University in 2017. He works mainly on the molecular epidemiology, antibiotic resistant and biofilm formation of superbug bacteria staphylococci. He is currently using molecular techniques such as pulsed field gel electrophoresis and whole genome sequencing to study the epidemiology and mutation of Burkholderia pseudomallei isolates in Thailand.

Ravi Tandon, M.Sc., Ph.D.

Dr. Tandon is an Assistant Professor in the School of Biotechnology, Jawaharlal Nehru University (JNU), New Delhi, India. His lab is working on HIV immunology and molecular biology. He did his Ph.D. on endogenous retroviruses (ERV) under supervision of Prof. Regina Hofmann-Lehmann from University of Zurich, Switzerland in 2008, and did postdoctoral research on HIV immunology between 2008 and 2011 in the lab of Prof. Douglas F. Nixon at San Francisco General Hospital (SFGH), University of California San Francisco (UCSF). Dr. Tandon also served as a staff scientist between 2011 to 2014 in the lab of Dr. Lishomwa Ndlovu at Hawaii Center for AIDS, University of Hawaii, Manoa. His primary interest is to study the gut microbiota in perinatally HIV-infected children in India. In addition, his lab is also working on age-related alteration in oral microbiome, pathogenesis of chikungunya virus infection, HIV latency, and H.pylori -HIV co-infection. He has published in peer-reviewed, high-impact journals, and currently supervises three PhD and two masters student and mentors one NPGH fellow.
International Mentors

Urusa Thaenkham, Ph.D.
Dr. Urusa is an Associate Professor in Parasitology at Mahidol University, Bangkok, Thailand. She received her Ph.D in Tropical Medicine from Mahidol University in 2010. Her primary research is molecular systematics of fish-borne trematodes and development of the molecular diagnostic tool for fish-borne trematodiasis. Current research, she involves in the Angiostrongylus research project and focused to study in species delimitation and population genetics of Angiostrongylus existing in Thailand.

Narin Thippornchai
Mr. Thippornchai joined the Department of Microbiology and Immunology at Mahidol University in Thailand as a Research Assistant in 2011. His research expertise includes molecular virology and tissue culture. His current research is on the development of immunodiagnostic assay for Zika virus infection. He is also involved in several projects in the laboratory which includes a study on the mechanisms of vascular leakage in dengue hemorrhagic fever and Dengue infection among acute undifferentiated febrile illness (AUFI) patients in Bangkok, Thailand, 2013-2015.

Indi Trehan, MD, MPH, DTM&H
Dr. Trehan is the Medical Director of Lao Friends Hospital for Children in Luang Prabang, Laos, and an Associate Professor of Pediatrics at Washington University in St. Louis. He is trained in pediatrics, pediatric infectious diseases, pediatric emergency medicine, and tropical medicine and hygiene. While he is interested in all aspects of tropical pediatrics, his major research interest is in childhood malnutrition, given that 45% of all child deaths worldwide under 5 have at least one form of malnutrition as an underlying cause. He is also greatly interested in improving the quality of pediatric care in resource-limited settings via human capacity-building and evidence-based improvements in health systems.
Ophelia Inez Weeks, Ph.D.

Dr. Weeks is Professor and President of University of Liberia (UL) since 2017. In 2012, she was recruited by the UL to assist with Liberia’s rebuilding efforts from its long civil war. She served as Dean of the UL College of Science and Technology till 2016. Dr. Weeks is a Professor Emerita at Florida International University (FIU). Dr. Weeks is an advocate for students and has a long-standing record at FIU for mentoring a wide cross-section of students for careers in biomedical research and professional schools. She spearheaded development of an innovative undergraduate biological sciences curriculum at FIU called Quantifying Biology in the Classroom. She has served as major professor and committee member-to-completion of 30+ graduate students and has supervised the research of over 40 undergraduate and high school students. At FIU, she served as PI of FIU’s Maximizing (Minority) Access to Research Careers – Undergraduate Student Training for Academic Research (MARC-U*STAR) Program, whose goal is to expose undergraduate junior and senior honor students to biomedical research in order to increase the likelihood they will enter doctoral programs. Dr. Weeks spearheaded organization of an Ebola Awareness Team in 2014 for UL’s campuses.

Sirida Youngchim, Ph.D.

Dr. Youngchim received her PhD in Medical Mycology from King’s College London, UK in 2004. Currently, she is a faculty at the Department of Microbiology, Faculty of Medicine, Chiang Mai University, Thailand. Her ongoing research is focused on *Penicillium marneffei* including rapid diagnosis and virulence factor of this fungus.
MHIRT 2018 TRAINEES REACH THEIR INTERNATIONAL RESEARCH DESTINATIONS

After a competitive selection process, a rigorous spring semester of Wednesday night meetings, working with local and international mentors to define their research projects, learning about cultural differences and attending pre-travel workshop on living abroad, 12 MHIRT student’s boarded planes between May 30 and June 3 for their international destinations. This year six students will conduct research in Thailand, two in Cameroon, two in Liberia, one each in Laos and India. This weekly Newsletter will chronicle some of their research activities, cultural experiences, and interesting observations, so we can all Stay Connected.

Team Thailand
After a 18 hr long flight from Honolulu with a 2 hr layover in Seoul, Christine Joy Baltazar, Joana Garcia, Jenny Nguyen, Jasmine Padamada, Kenneth Go and Allison Nguyen landed safely in the middle of the night at the Suvarnabhumi Airport in Bangkok where they were warmly greeted by their international mentor Dr. Pornsawan Leangwunwong and her lab technician Mr. Chong. Jasmine reports, “I was able to meet Dr. Pornsawan (my mentor) and Mr. Chong in person because they are also our supervisors. They were very helpful in getting us to the hotel and settling in. On orientation day they introduced us to the efficient Bangkok Transit System (BTS), introduced us to our mentors and workstations, and even took us out to lunch at a restaurant in Siam. I am very excited to start working with everyone tomorrow!”

Jenny met her mentor Dr. Reshmie Ramawataram at the Thai Red Cross AIDS Research Centre. Because Jenny’s research is on public health, this health center is located in the community where Jenny will be working on her research for the next eight weeks. She reports the weather to be “insanely sunny and humid”. In fact the weather is almost remarkable to all. Christine describes it as “the worst.” Though Joana is “a little more sweaty,” she also says that she is acclimating to the weather. The trainees are really appreciating the fast BTS sky train because of the traffic on the road. However the trains are crowded, even for those who have used mass transit, often with passengers in each other’s personal space! The Bangkok students did some shopping at what is described as “gigantic” shopping malls and "huge" markets. Jasmine observes that shopping is a way of life in Thailand.

Next day Kenneth Go and Allison Nguyen arrived safely in Chiang Mai to discover “blistering heat”. After settling into their fully furnished apartments, they spent their first day with their Chiang Mai University (CMU) mentors, Dr. Suwit Saechao, and Dr. Sirida Youngsuk, and UHM mentor, Dr. Pom Sailatsa. Their mentor’s took them to the market, which is more than just food being sold. Live music, crafts, and “people just having a good time” surrounded Kenneth and Alison. Guided by Dr. Pom and Dr. Suwit, they are shown the labs where they will be working. They are happy to report that the CMU is only a 10-minute walk from their apartment. Kenneth and Alison experience some early shop till you drop experience, 6 hours at the mall (!), buying necessities like bottled water. They begin their research immediately on Monday after easily finding the lab. Kenneth is working in Dr. Sirida’s lab doing cell cultures while Allison is working in Dr. Suwit’s lab and simulating MRI
phantom images. (Wow!) Alison reports, “I worked with Dr. Susit on trying to simulate MRI phantom images. Kenneth and I left our labs around the same time and we went to get crepes on campus”. Keep us posted as we provide details on both their lab tasks and techniques.

In Bangkok, Dr. Pornsavaw has provided a journal club schedule for the trainees. The international mentors will assign the publication that will involve students’ projects, and the students will give a 15-20 minute presentation to peers and mentors, who can join the journal club on that week. In the last week of journal club, Tuesday July 23, all of the students will give a brief talk about the results and the significance of their project. Thank you Dr. Pornsavaw for the journal club schedule. We’ll keep you updated on the journal reports as each student presents. Stay tuned!

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Students</th>
<th>International Mentors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday 12th June</td>
<td>9:00-10:00</td>
<td>Jasmine Padamada</td>
<td>Pornsawan Leangwutiwong</td>
</tr>
<tr>
<td>Monday 18th June</td>
<td>9:00-10:00</td>
<td>Jenny Nguyen</td>
<td>Reshimie Ramautarsing</td>
</tr>
<tr>
<td>Monday 25th June</td>
<td>9:00-10:00</td>
<td>Christine Joy Baltazar</td>
<td>Narisara Chanthara</td>
</tr>
<tr>
<td>Tuesday 3rd July</td>
<td>9:00-10:00</td>
<td>Jeana Garcia</td>
<td>Parin Dekumyoo</td>
</tr>
<tr>
<td>Tuesday 10th July</td>
<td>9:00-10:00</td>
<td>Kenneth Go</td>
<td>Sirida Youngchin</td>
</tr>
<tr>
<td>Tuesday 17th July</td>
<td>9:00-10:00</td>
<td>Alison Nguyen</td>
<td>Suwit Saechko</td>
</tr>
<tr>
<td>Monday 23rd July</td>
<td>9:00-12:00</td>
<td>All students</td>
<td>All mentors</td>
</tr>
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Christine reports that their first full day of work “went really well.” All of them relaxed in the evening by getting take out food, eating together family style, and watching Netflix. Sorry no photos of their first day home from the lab since they were very excited after their first day meeting everyone and getting started with their research!

The trainees in Bangkok are becoming accustomed to their daily schedules. They have breakfast together, meet back down after grabbing their bags from their rooms, and catch the BTS together. They laugh as they experience the very crowded morning rush hour and a much closer personal space! They are also happy to finally try mango sticky rice, which they buy at a food court in Tesco.

India
After a 35-hr long flight from Honolulu with a 15 hr 30 min layover in Newark, MHIRT solo traveler, Landon Negreira, arrived safely at the Indira Gandhi International Airport in Delhi, India at 9:30 PM on May 31 and was greeted by Preeti and Ankush students of Landon’s mentor Dr. Ravi Tandon. They had lunch at a food court. He will be staying for next 5 weeks at the Chintan Guest House on the campus of the Jawaharlal Nehru University (JNU), which is only 10 min walk from his laboratory. Unfortunately the hotter summer in New Delhi (compared to Hawaii) is making Landon “more exhausted than usual”. From experience, we are confident that Landon will acclimate to the warmer summer soon! Landon starts work immediately on Monday in Dr. Tandon’s lab where he worked on his literature review and reports and learned cell culture from lab assistant Preeti. Landon is also preparing for his cultural project, yoga!

Laos
Annalyn Oliveros, MHIRT solo traveler to Laos, arrived in Bangkok in the middle of the night on June 4, after a 18-hr long flight, and checked in the airport hotel. Thanks Annalyn for carrying last minute research supplies for your peers in Bangkok and Chiang Mai. Chanya (masters student in Dr. Pornsawan lab) picked up supplies. Big Mahalo to Chanya! Next day morning, Annalyn met with her mentor Dr. Indu Trehan at the airport, boarded a short 2 hr flight and arrived at the Luang Prabang International Airport in Laos. Annalyn writes, “I’m settled in my guest house. The power went out for the first 30 minutes but it’s back on”. Welcome to Laos Annalyn!
Team Cameroon
After a 34 hr and 30 min long flight from Honolulu with two layovers of 9 hr 30 min and 3 hr at Seattle and Paris, Booyanudh Jiyanrom, John Paul Arios (JP), and copilots Booyaa and Livo Esamu and Uncle Joshua (driver), JP reports, “We were able to sleep in and then we went into the city the following afternoon to buy a cellphone and SIM cards, groceries for the house and other snacks. We are near the front door. The weather is nice and cool here at night and warm but not too humid during the day.

Dinner consists of beans with onions and some fish, boiled potatoes and fresh salad made of cabbage, carrots, bell peppers, avocados, cucumbers and eggs. Booyaa and I will be doing a part of her cultural project tomorrow at one of the elementary schools. She will be giving a short presentation to the 6th graders about Hawaii and play a few games with them where they will win macadamias nut chocolate and key chains. We also plan to go into the lab and meet everyone before we begin on Thursday”.

Team Liberia
Dr. John Berestecky scopes out the scene and prepares for the arrival of MHIRT student trainees. Dr. Berestecky settles in his apartment by preparing a spaghetti dinner and shopping for a futon for his makeshift bed (he ends up purchasing a more comfortable mattress from a town area called Red Light). He is preparing for the students’ arrival by developing an agenda for the first two days to include a tour of Monrovia and the University of Liberia, general introductions to mentors and facilities (check out the European wall outlet), checking out their apartments, having the trainees make lists of what they need and need to buy for the apartments. He is looking into having a possible cook.

After a 42 hr and 30 min long flight from Honolulu with two layovers of 12 hr and 4 hr 30 min at Newark and Brussels, MHIRT students Kinnalei Garude-Machida, Melissa Takaza, and graduate student Brien Huan arrived in Liberia on June 5 at 7:00 PM with their massive luggage (mostly research supplies), and were received at the Roberts International Airport in Monrovia by University of Monrovia Protocol Officer Deontee Tubman and our own John Berestecky. Dr. Berestecky reports, “we had two cars (SUV’S) and their drivers. One car was rented at the last minute when it became apparent that the university bus was not going to be available. Ample transport capacity was needed particularly since the students were traveling HEAVY with two large checked suitcases and fully loaded to capacity with carry-on bags. Weather was fortunately congenial. There was a pause in the typical rainy season weather of heavy showers and thunderstorms and the nice weather continues today”.

Melissa reports, “Last night we arrived safely in Monrovia, collected our luggage, went straight to the hotel, then ordered dinner ... all before the kitchen closed at 10pm! We are extremely blessed that the entire process went smoothly and on time, including all flight segments on our journey to Liberia”. Today the Hawaii Team will be attending a lecture entitled “Understanding West Africa’s Ebola Epidemic: Towards a Political Economy”. Finally Dr. Berestecky is scopes out the area for mosquitoes, and reports that so far, he has not seen any. (Keep us posted on any mosquito sightings and what you find out about malaria stats!).

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MHIRT 2018 TRAINEES SETTLE INTO THEIR INTERNATIONAL RESEARCH DESTINATIONS MEETING THEIR COWORKERS AND GETTING USE TO NEW RESEARCH LAB/FIELD ATMOSPHERE

Team Cameroon
Boonyanudh Jiyaram, John Paul Arios (JP), and Yukie Lloyd (chaperone) experiencing Internet connectivity issues, teach about Hawaii to 8th graders, and watch a championship soccer game: please stay tuned for future updates. Yukie describes the Wi-Fi limitations as worse than previous years. They are able to visit the zoo. Boonya is often greeted by strangers with “nihao”, when they say Hi. (Very common in countries across the world with limited visitors, for the locals and other foreigners alike to assume any Asian is from China or Japan). The people are friendly and smile back when JP smiles at them. JP and Boonya visit PNEU School from the nursery to level 6 (6th grade). They teach 6 classes about Hawaii where they learned to “Shaka” and say “Aloha” and “Mahalo.” They are treated to a closing ceremony on the second day with dancing and performances. Thanks to Professor Leke’s driver Jovite, JP and Boonya over the weekend attended a championship football (soccer) game where the Cameroonian women beat Congo 5-0, qualifying the team for the Ghana 2018 world cup. ALLEZ LES LIONNESSS! JP and Boonya visited the Biotechnology Center to meet everyone and introduce themselves. Stay tuned for their lab update as the medical students are currently using the lab to run their assays for their research defense. On the unfortunate note, Boonya received an early birthday present from Mother Nature.....”viral gastroenteritis”. She first-hand experienced the medical care in Cameroon. Treated like a “VIP guest”, the whole process from waiting, registering, to seeing the physician took 3 hours. She is still grateful and looking forward to a full recovery within the few days before her actual birthday this Friday! Note – As of today Boonya is doing good. Not to worry.

Team Thailand
Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar are learning the methods and techniques for their research projects, while experiencing more Thai culture. Christine, guided by her supervisor P’Ningm, works with Pulsed Field Gel Electrophoresis, a method to run gels. Joana is learning three techniques. Along with her Thai colleagues they have infected six mice (5+1control) with Angiostrongylus Cantonensis (rat lung worm disease worm found in Hawaii) L3 larvae collected from freshwater gastropods, and Joana assists in weighing the mice, change their food, water, and hay. She is also learning to subtype A.Cantonensis adults by comparing morphological features. Finally, she will learn to do an immunoblot for the serological diagnosis of Angiostrongylasis. She will continue the morphological studies and immunoblotting throughout the week. Jasmine learned where the lab keeps all of their reagents, where their
protocols are kept, and gets tips to minimize contamination. She and Aumain (a fellow intern) are given 35 samples to start with. For the second half of the week, Jasmine and Aumain will perform cDNA synthesis, conventional PCR, and gel electrophoresis. Jenny shadowed Dr. Anchalee and Dr. Win at HIV-NAT. Jenny also received an orientation from Dr. Reshnie Ramautarsing who explained that her research topic would be on identifying places where men who have sex with men (MSM) and transgender women (TGW) prefer to get Pre-Exposure Prophylaxis (PrEP). MSM and TGW are at-risk groups in Thailand, the US, and globally for contracting HIV. Additional guides Pitch and Rain showed Jenny around the facilities, and gave her a more detailed tour of the Tangerine Clinic, part of the Thai Red Cross Research Center where Jenny is working with Dr. Reshnie. Jenny continues to do the literature review for her research topic. And that is a productive week for Team Bangkok’s first full week!

At Mahidol University, the students experience a cultural merit ceremony for the Tropical Medicine faculty who prayed and gave offerings (incense and phuang malai) at three different points in the building. Five monks performed the ceremony with everyone praying and chanting, and it was a “chicken skin” event.

All trainees appreciate the warm, welcoming, and patient mentors, students, and lab staff in guiding and orienting them especially when they are in their new environments. Joana observed the concern over making sure that she has eaten lunch, around 11:00 am to 2:00 pm. Whenever she is greeting someone, she is asked if she has eaten lunch. If she answers “no,” they offer her food. She feels “incredibly blessed and honored to be among these researchers.”

Kenneth Go and Alison Nguyen have made good progress on their lab research, and Kenneth watched a 4D movie.

MHIRT Spotlight: As promised, more on Alison’s project: “This week I have been working on a project assigned to me by Dr. Suwit. The assignment given to me is to simulate several MRI phantom images in MATLAB. All of my work has been on the computer so far. I have realized that there is an endless amount of ways to write a code to create a certain image. Some methods involve many lines of code and other methods can only require one line of code. I have learned this week that programming requires patience and creativity. At the beginning of the week, I attempted to create an image and I spent hours writing a code. When Dr. Suwit took a look at my code, he told me that there is a much shorter way for me to execute my task. I was frustrated, however, the next day I was able to create a much shorter and more efficient code.”

Kenneth, in Dr. Sinda Youngchim’s lab is learning how to prepare cell culture media for Malassezia (a fungus), streak plates for the strains, culture keratinized cells, extract DNA from the fungus, perform a Bradford assay, and cast gels for SDS-PAGE. He is looking forward to finally infecting the keratinized cells with the Malassezia fungus, as both cultures have been incubating since he first cultured them on his first day in the lab. He continually appreciates being taught by the graduate students on how to perform the techniques. He has now read one of Dr. Sinda’s graduate student’s 100 page master’s thesis, and as a result has learned considerably about the lab techniques feeling more like “an expert on Malassezia after reading it and other papers” and through the guidance of Drs. Sinda and Ang.

Like the students in Bangkok, the importance of respect is also observed in Chiang Mai. Kenneth explains that when addressing senior persons, unless they have an official title (like Dr. Sinda), you say “P” before their name as a sign of respect. Similarly, the older individuals address younger individuals as “Nong.” Since Kenneth is the youngest person in the lab, he learns that he addresses everyone with the “P.”

Kenneth reports that he saw Jurassic World in 4D, to be released June 22 in US, but has already been released in Thailand!!! He finds the live effects—seats shaking and moving and light, wind, and water effects—“intense” and “awesome.” So far, Kenneth and Alison have eaten at Korean and Japanese restaurants in their neighborhood. Alison has also tried different types of Thai food on campus; finding them “fulfilling and delicious” even though portion sizes are smaller than back home. She finds the food spicy and well seasoned. She also reports that she is adjusting well to the weather, likes the apartment, and is getting very familiar with the city.
India
Solo traveler, Landon Negrillo found success in his first cell transfer, while also letting us know how we can stay in touch with him. On June 4th (also Landon’s birthday!) he started work in the lab. He learned how the lab operates, what resources are available, and received his first assignment. He began his first steps into hands-on work where he was provided a flask of THP-1 cells and transferred them into a larger amount of media. Though he experienced some “mishaps,” lab assistant Preeiti informs him that his cells were fine.

Landon gets out and about to the mall where he eats lunch and ice cream. Unfortunately he is still experiencing problems with his SIM card, and as the solo student in India, he wants to be reached! Friends, family, and MHIRT can reach him on LINE, WhatsApp, or his Hawaii number.

Laos
MHIRT Spotlight: Annalyn “Anna” Oliveros, Sabadee! (Meaning ‘it goes well’ in Lao – most imp phrase in Lao) “This first week was a little rough especially with the jet lag but I am surviving. It is really humid and there is no AC in the hospital but we sometimes get a breeze. I am staying at Cold River Guest House and I love it! It is in walking distance of town, the room is very clean, there is AC and the owners are really nice! During my first few days here, I shadowed my mentor Dr. Indi and the nutrition team (Diana, Toum, and Soulee). There is a meeting every morning at 8:00 AM, and rounding in the inpatient department starts at 8:30 AM. There are about 25 children in the inpatient department, and it usually takes roughly 4 hours (sometimes 5) to evaluate every patient in the hospital. The nutritional team actually does two rounds. The second round is with the medical team to evaluate what is best for the patient and to consult from the nutritional side.

There are a lot of things that I have been learning that is not common in the United States. For example, there is a lot of Beriberi here. Beriberi is a condition of Vitamin B-1 deficiency, also known as thiamine deficiency. This is caused by a “taboo diet” from the mother. After the mother gives birth, she does not eat much. At the most the mother will only eat rice, salt and ginger, which does not include a lot of nutrients. This diet compromises the amount and quality of breast milk that is provided to the baby, which causes the baby to develop Beriberi. Therefore, the treatment is treating the baby and mother with thiamine. It’s interesting with this type of Beriberi because it’s not the fact that the mother does not have enough food, she just doesn’t eat due to cultural reasons. Another medical condition that is not often seen in the U.S is skin burns. There are currently two children with major skin burns. One of them fell into hot water while the parents were cooking. The other patient grabbed onto an electrical wire to try to catch himself falling after he was trying to kill a bird to bring back to his family to eat.

Anna meets many volunteers at the children’s hospital though there are few from the United States. Volunteers are from Italy, Canada, Australia and the U.K, and Anna finds being around the diversity “amazing.” (Anna, we hope this encourages more interest in global health work where it’s often international teams!) She starts work with Sunlee, a nutritionist in the hospital, who will teach Anna how to calculate WHZ and body mass index (BMI) to determine if the patient has moderate acute malnutrition (MAM) or severe acute malnutrition (SAM). Anna also will learn how to calculate how many calories to give to patients depending on their patient’s weight and which type of feeding is provided. Anna visited Mount Phousi “sacred mountains” with people from the hospital that is also staying at Cold River. They had to miss the beautiful sunset to head to a social gathering for one of the volunteer nurses who was going back to her country.

Anna observed that most people use bicycle, mopeds and motorbikes, with few cars. She also experienced the culture of big vehicles rule with no pedestrian friendliness. Anna rides the ‘tuk tuk’ to get around so that she doesn’t always have to be a pedestrian. Though the tuk tuk is $4-5 per ride, not cheap, Anna is also abiding by UH student travel rules by not using a bicycle, moped, or motorbike! Finally Anna tries a few local dishes: spicy sticky noodle with meat, and papaya salad with sticky rice and beer lao.
Team Liberia

"Welcome to Liberia!" The trainees began to get their orientation by visiting the University of Liberia Capitol Hill and Fendall Campuses where they meet Griffiths, their guide, and international mentors Ayesha Boll-Gam, Varnoy Kamara, and Dr. Peter Humphrey. At City Hall they attended a lecture for a book launching "Understanding West Africa’s Ebola Epidemic: Towards a Political Economy.” Melissa describes, "per the discussion and comments by the guest speakers, appears to be more epidemiological in scope and speculative (i.e. conspiracy theories) than scientific, per se. Dr. Stephen Kennedy, one of the authors/editors, was a "standout" and helped to dispel some of the conspiracy theories by citing science-based evidence. They also toured the lab, unpacked supplies, and met many of the students in the lab whom they will be working with. In the hallways, they also witnessed students protesting their registrations!

The students began to experience common occurrences in developing countries. Many things in daily American life that we take for granted arise. Melissa reported “processes to get tasks accomplished, even seemingly simple ones, can become long and arduous. What one anticipates might take 30 minutes can in fact become 2+ hours.” She, Kiana Lei and Brien, experienced a much longer than expected process of getting Wi-Fi coverage. (The good news is that they now have SIM cards to communicate with friends and family back home.) In the grocery stores, imported items especially from the U.S. are very expensive. The trainees experienced other circumstances, more common in developing countries. When they needed to buy rubber shoes for the lab, there was no centralized store apparel or shoe store. Rather, they were taken to “thousands of stalls” that sell a variety of products. Finally the water pressure in the apartment is very low, if available at all. They experience their first electricity outage. This prompts Dr. Berestecky to say, “Welcome to Liberia.”

Notwithstanding these new experiences, the trainees settled in and moved from the hotel to their apartment. Because of the water issues, the students resort to simpler ways of cleaning up. They discovered that bucket baths with boiled water gets the jobs done just as well, while greatly conserving water! (In a future newsletter, we will provide Dr. Vivek Nerurkar’s, MHIRT PI, step-by-step advice on boiling water for drinking and brushing teeth)

The students spent their free weekend at the outdoor market. Notable foods sold was peanut butter, rice, sesame seeds, and raw chicken and fish (and as Kiana Lei points out, “a MHIRT no no.”) The full bags of charcoal sold were brought on foot from Bengailit (More on this interesting story in the future). They have lunch at a “cook shop” across campus where they ate a savory stew of cassava leaves and fish (Melissa’s favorite), and a spicy stew of beans. The owner was described as “gracious, well spoken, and extremely customer oriented.” After lunch, the trainees visited Dr. John Berestecky’s church - The Liberian Missionary Church. They noticed animals such as donkeys, cows, and goats roaming freely on the church grounds. The pigs, which are raised for slaughter and sold, were secluded to a farm. This church is also a boarding school for orphan children and families from difficult situations. (Sounds like a very compassionate church for children, families, and animal friends alike.)

Finally, Melissa and Kiana Lei have a very memorable visit with Brooks’ (friend and driver), where they met his daughter May who walks 1.5 hours each way to the University of Liberia. The trainees received an open arms welcome and talked with all the people they meet. Kiana Lei observed the open friendliness of the people where a person or a group of people will, in addition to waving back at you, have faces that light up and smiles rise from ear to ear when they are waved to! On another note, Dr. Mosoka Fallah, Deputy Director of National Public Health Institute of Liberia, thanks Dr. Vivek Nerurkar, for putting Liberia “on the map,” with this MHIRT partnership and project with University of Hawaii.

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MHIRT 2018 TRAINEES PRACTICE THEIR LAB TECHNIQUES, BEGIN WRITING THEIR REPORTS, EAT MORE LOCAL FOOD, AND EXPERIENCE WORLD CUP VIEWING

Team Liberia

“Hello-o!” Kianalei Garada-Machida, Melissa Takaaze, and Brien Haun work together in the lab, experience more Liberian food, and tour Monrovia. Kianalei and Melissa began week 3 with two Liberian students Abigail and Saymajukon who joined them in the lab where they go over the basic immunology aspect of an indirect enzyme-linked immunosorbent assay (ELISA). They coat their ELISA plates with Ebola virus (EBOV) and Lassa virus (LASV) antigens. Brien also started running ELISAs on dog sera, while Kianalei and Melissa made reagents and assisted as needed. After Brien added the secondary antibody and substrate and ran the assay, Kianalei, Melissa and the team reviewed the data for consistency. After brainstorming, the students re-ran the ELISA on the same samples and were satisfied with the results. They also analyzed the results from their first experiment on four dogs and obtained promising results for both EBOV and LASV. The trainees also conducted a “cool” pipetting and dilution exercise where they compared the optical density of their H$_2$O and crystal violet mixture, which demonstrated their pipetting skills.

The trainees were introduced to more Liberian culture through food. After work, the Liberian students (Abigail and Saymajukon) introduced Kianalei and Melissa to a new “cookshop” near campus. (Their favorite restaurant is “Identical Friends”). They ate roasted fish and palm butter with rice, spicy stew of potato greens, and cassava leaves. At the end of the week. Dr. Varney Kamara and other labmates threw the trainees a welcome BBQ, where they enjoyed some homemade baked fish, fried plantains, and a lovely green salad. Melissa remarked, “Great cultural experience!”

Their weekend activities included a visit to the defunct Ducor Hotel, which in its time was a spectacular 5-star hotel, until it closed around 1989, due to the First Civil War. Kianalei and Melissa then visited Wulki Farms in Careysburg owned by Benoni Urey, a Commissioner under former President Charles Taylor, and Liberia’s wealthiest man (as of 2014). Melissa described the property: “Wulki Farms had been a bustling hub of leisure with agricultural and livestock production, until the Ebola epidemic outbreak, and the chickens were killed, animals removed, and production shut down. Now what remains are beautiful rolling hills, gardens of pepper plants and papa (aka papaya), a serene winding road, and Urey’s mansion, which could be the most elaborate house in Liberia. The signage is also still visible, while the agricultural buildings are largely deserted, except for donkeys, horses, and geese.”

India

Landon Negrillo wishes all fathers a “Happy Father’s Day” and finds the lab “a lot of work and a lot of fun.” Landon maintains a cell culture of THP-1 cells, which he finds to be more complicated than how it is described on paper through his readings. Maintaining the cell cultures involves changing the media, and when the cells form large enough “clumps” within the flask, it is time to separate the cells into more flasks or to create cryovials and freeze the cells for later use. Everyday
Including weekends, Landon goes into the lab where he immediately goes into the cell culture station and checks on the progress of the cells. From there he distinguishes what he needs to do for that day and proceeds. Unfortunately, he finds the Caco-2 cells to be contaminated and is waiting for another batch of cells. Landon comments that luckily he has a fellow student, Umesh, who helps him through the process. Landon also met with his co-mentor Dr. Ashwini Kumar Ray to discuss his project. One of the end goals of Dr. Ray's research for Landon is to use C. elegans, a small roundworm, to look at the effects of microbial translocation within an in-vivo system. Landon explains that the intestinal tract of C. elegans is also evolutionarily similar to humans to provide them with a relative idea of how our own body acts when under the same conditions.

Landon enjoyed a BBQ meal over the weekend. Dr. Ravi Tandon, his mentor, organized an appreciation and welcome lunch for everyone at Barbeque Nation (Landon’s favorite restaurant), outside of the Jawaharlal Nehru University campus. Landon described the food as “an Indian version of Yakiniku.” Three courses are offered—appetizer, main dish, and dessert, all with vegetarian options. He approaches the food like an international traveler: “I found it exciting that with each new dish that was brought to the table, without knowing exactly what it was, I would just try it and I think that’s what truly makes traveling great. That thrill of trying something new without anything holding you back is the sign of another experience to add to the list.” During the meal, he saw a family sitting nearby and is reminded to wish his own, and all other fathers: “Happy Father’s Day!”

Team Thailand
Kenneth Go and Alison Nguyen continue lab work and writing their manuscripts, and learn about religion in Thailand, and experience the popularity of the World Cup. Alison’s research involves working on code, which she finds a challenge but also getting more familiar with coding language. She has Dr. Suwit check her coding, and then Alison makes modifications to make the image cleaner. She met Dr. Kittichai, who specializes in programming and building user interfaces. He was able to help her when she “hit a roadblock” and will continue to learn from him including MATLAB.

Trainee spotlight Kenneth Go: Kenneth is working on cells infected with Malassezia. “The research I’ve done this week has not been super intense, but has been extremely enjoyable. After infecting my keratinized cells with the several strains of Malassezia on Monday, I had to incubate them until Friday. Initial cell observation indicated that several cells already transformed from the yeast phase into the mycelial phase. It’s a really good sign! In between, I was engaged in other aspects of research. When I’m not in the actual lab doing lab work, I am at my desk reading more literature on Malassezia and incrementally writing and editing portions of the final scientific manuscript. Additionally, I spent time observing P’Ang, who was doing gel electrophoresis on strains of M. furfur. P’Ann told me that Dr. Sirda, my mentor, might want me to do the PCR and sequencing for strains of M. globosa since one of my lab materials has not yet arrived and two are at Mahidol University.

There’s always something to do in the lab, and it is a riveting experience.”

Alison and Kenneth continued to read the literature on their research topics and drafted the Introduction section of their manuscript. Kenneth even used the SMOG (Simple Measure of Gobbledygook) readability test (which was taught to MHIRT students during the pre-travel workshop) to ensure that his writing was understandable for at least a 12 grade reading level.

The highlight of the trainees’ weekend was having the graduate students from Dr. Sirda’s lab borrow a rental van and take Alison and Kenneth to Wat Padarapirom, a Buddhist temple complex. They found the art to be “very intricate and colorful.” There are Laotian and Malaysian influences in the architecture. Kenneth described the temple: “Everything is very ornate, but also bursting with color.” After the temples, they visited the Tiger Kingdom where they saw tigers of different sizes and species. Alison’s favorite was the white baby tigers who were playfully biting off the slippers of kids. Their last stop was the Chiang Dao cave. The mountain is the third tallest mountain in Thailand, and its caves are bursting with over 12 km of unmarked caverns and passages. They explored the cave with a female
tour guide who wore only slippers and used only an oil lamp for lighting. While she effortlessly glided through the pitch-black caverns, she explained the meaning of the different rock formation structures within the cave, which resembles culturally significant animals (elephant, tiger, chicken, and so much more). Kenneth described their experience touring the cave: “Some portions of the cave were so narrow that we had to get on all fours just to advance to the next portion of the cave. Other times, the steps were so steep that my shoes constantly slipping made everyone nervous. If that wasn’t enough, there were so many bats overhead that I was hesitant to use my camera flash. It was the first time I ever saw bats and I was so scared of that classic movie scene where disturbed bats all fly out of the cave. Several of the caves featured shrines and statues; some were Buddhist while others were actually Hindu. I was told that monks regularly visit the caves and I could definitely see why.”

Besides their weekend tours, Kenneth was reminded of the significance of religion in Thailand. Over a lunch, Kenneth spoke with two lab mates, about their faith (Buddhist and Christian). He found it refreshing that both of them were “passionate about their beliefs and what specifically appealed to them”. He learned that about 95% of people are Buddhist in Thailand with 4% being Islamic, and 1% being Christian. On the way to lunch every day, Kenneth also noticed that people in my lab always “wa?” whenever they pass a temple or shrine of Buddha. This also emphasizes the cultural significance of respect as well.

Also over the weekend while shopping, Alison and Kenneth saw official World Cup merchandise being sold on Nimman Road. They planned to watch a match on the big screens at Nimman.

Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar attend oral presentations, participate in a journal club, and experience the World Cup fever. This week the trainees visited Wat Traimit (Temple of the Golden Buddha) and like the students in Chiang Mai, also learned that religion is very important in Thailand. They looked at historical art pieces including storytelling Buddha statues. The importance of faith and visiting the temples has gotten Jenny (whose family is Buddhist though she is not practicing herself) more interested in learning more about Buddhism.

Jenny, (who celebrates her birthday this week, happy birthday!) is working at the Thai Red Cross Tangerine Clinic. She continued to participate in shadowing, this time with Dr. Carlo in SEARCH where she found it “incredible to get a glimpse of the health care in Thailand.” SEARCH researches new therapies to cure for acute HIV, and Jenny was exposed to her first medical experience when she gets to observe three lymph node biopsies. She continued to work on the “Introduction” section of her manuscript and prepared for a journal club presentation with Dr. Reeshmi Ramautarsing.

Christine met with her mentor Dr. Narisara Chantrattita who explained different factors that are causing the gel to run the way it is doing. With P’Ning’s help, they changed the settings to try and fix it. Christine is learning to troubleshoot lab techniques and also found that extra side tests may need to be done to obtain good results. They will try different settings on the PFGE machine to get better images of their samples, which will be used for their manuscript.

Jasmine reports, “This week, we completed conventional PCR for the Zike virus envelope and NS5 genes. This taught me the importance of working quickly and carefully in order to minimize contamination. Since we ran multiple gels, I became comfortable with how the lab runs, where the reagents were located, and how to plan things out. Next week, I will be running more gels to prepare for gel extraction”.

The trainees continue to watch the World Cup on TV as well.

Team Cameroon
Boonyanudh Jiyanom, John Paul Arios (JP), and Yukie Lloyd celebrate an MHIRT birthday and participate in various academic activities.
As most of the world is doing, JP and Boonya watch the World Cup on TV in their free time. In the lab, Boonya and JP were prepping samples
for DNA isolation. They also prepared for a two-day workshop with Japanese researchers who will be giving lectures while Boonya and JP teach the hands-on technique for collecting skin samples with swabs. They also attended a colloquium of MD student’s defense theses; everyone passed and officially received their degrees!

Another MHIRT birthday girl, Boonya, celebrated with Louise, Dr. Mike and Obase, along with JP. They ate at a restaurant where they picked the fresh fish, which was then grilled for them. For side dishes, they ate fries, fried plantain, baton manyok (fermented cassava). The students’ cultural experience continued when Yukie took them to a tailor where they will have custom-made Cameroonian attire. They selected their fabrics and were measured, while learning from Yukie how to bargain for a good price. JP was unable to find a fabric that he wanted, so the tailor offered to find the fabric for him. Stay tuned for photos of the outfits!

Laos

**Annalyn “Anna” Oliveros learns about malnutrition and its effects on Laotian people, and experiences price bargaining at the night market.** Anna continued to shadow the nutrition and medical teams. She was able to observe how food is prepared in the Lao culture. She learned about different treatments for severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) depending on age, treatable illness (e.g., HIV, TB, heart disease with planned surgery, mild and improving developmental delay) and underlying illnesses (e.g., Cerebral palsy, Down’s Syndrome, congenital or chronic heart disease, severe developmental delay, chronic lung disease). She regularly meets with Dr. Trehan and Diana (nutrition team leader) to discuss their research. Learning about the health conditions that the Laotians may contract reminded Anna how fortunate she is to live in Hawaii.

Anna learned about practices common in more conservative developing countries. Here in Laos, price bargaining happens at the night market. If the customer walks away, the seller lowers the price! At the Kuang Si Waterfalls, people were swimming fully clothed. In many cultures, when people swim, they stay fully clothed (with the bikini being a big no no).

**Daily Life Spotlight: Doing Laundry**

Daily chores that we may often take for granted can be done differently when in another country. It’s often the daily routine things being done differently in another country that provides that experience of having lived abroad, providing a glimpse of how people may live differently day-to-day. Doing laundry is a daily (or weekly) chore that varies across countries. How the trainees wash their clothes in each of their countries is described.

In Bangkok, Christine, Jasmine, Jenny, Joana used the washing machine and dryer only to find that the dryer is not very powerful, and they ended up air-drying their clothes.

In Chiang Mai, Alison and Kenneth walk 15 minutes to a Laundromat to get their clothes washed and dried.

In Liberia, Kianalei and Melissa hand wash and air-dry their clothes!

From India, Landon reports, “My guest house has a washing service, but if I have time I hand wash my clothes instead so I don’t have to pay”.

From Cameroon, JP and Yukie report, “We haven’t had to wash our own clothes yet. This year Prof. Leke hired a house girl, Beatrice, to do our laundry. She has been such a huge help and has washed our clothes without us asking. One day she even went out and bought more laundry detergent because we were running low, with her own money! We made sure to pay her back”.

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MHIRT 2018 TRAINEES DEVELOP THEIR ROUTINES INCLUDING FAVORITE EATERIES, WORK IN THEIR LABS, AND FIND WAYS TO ENTERTAIN THEMSELVES

India

Landon Negrillo learns yoga. Landon attends International Yoga Day Events, which spans several days and consists of morning mass yoga practice and evening presentations and discussions on yoga. He either attends yoga classes at JNU or uses self-study videos recommended by Dr. Ravi Tandon who also practices yoga. I have been trying my best to attend Yoga classes, he said. Landon mentioned also that he is glad to be traveling a lot more since arriving in India 3 weeks ago. This past weekend, along with Dr. Tandon, Dr. Ray, Preeti and Uvinder, he visited the Rail Museum, Parliament and Embassy buildings and lastly the historical landmark, Agrasen ki Baoli (see photo on the left). In the lab, he inoculates culture plates with C. elegans and will check their growth for during the week, so far the nematodes are "growing well." From there he will consult with Dr. Ashwini Kumar Ray on the next steps. Later in the week Landon discovered that the C. elegans he had been nurturing has multiplied, which is better than expected.

Team Thailand

Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar gave oral presentations, participated in a journal club, taught English and enjoyed watching the World Cup. Christine and Jenny delivered their presentations during the journal club. Dr. Pornsawan wrote that Jenny "did great and we had a lot of interesting questions to discuss on that day. Moreover, we can connect very well with the Chiang Mai team." When the trainees have spare time, they watch the World Cup, the Incredibles in 4D (where Jenny got mild motion sickness), other TV programs and window shopping at the mall, which as they have observed since Week 1, is a pastime for In Thailand. The trainees walk around their neighborhood, and as Jasmine observed, "This showed me that there is a wide spectrum of lifestyles in Bangkok (much like Hawaii)."

Student highlights of their research:

Jasmine: "Out of the 35 Zika virus (ZIKV) infected patient samples that I am working with, 15 had a positive band by PCR for the ZIKV envelope gene, and 20 had a positive band for the ZIKV NS5 gene. This week, I was able to run a gel electrophoresis and do gel extraction on the 15 PCR positive samples for the envelope gene. After that, we sent the purified DNA to Macrogen for sequencing. We will be obtaining the results within the upcoming weeks. I am very excited to see the outcome! Next week, I will be working on more PCR and gel extraction, but for the ZIKV NS5 gene.”

Jenny: Delivered a journal club presentation at Mahidol University. She met with Dr. Reshnie Ramautarsing to review her paper outline, introduction draft, methods draft, and what is expected next week. After the journal club presentation, Jenny joined Christine’s lab mates for her English lesson. Jenny described the session: "Christine goes over the pronunciation of scientific words by reading excerpts from scientific articles. At one point, each lab mate tried to read a short paragraph then Christine repeated it so that they could make corrections. It still surprised me that something so natural to us came so
difficult to them. They actually know a bit of English and explained that the tone difference made it hard because Thai has multiple tones while English is smooth with no tones. Also, Christine taught them a few Filipino and Hawaiian vocabulary words and they taught her how to count from one to five in Thai.”

Joana: “I ran gel electrophoresis and extracted DNA from four samples that had faint bands from the previous run. DNA from 10 bands were extracted and nine samples will be run tomorrow. The only new update is that I smashed my finger in a bathroom stall today and now have a bruise on my pinky finger—and none of Jasmine’s samples were contaminated!”. (Picture on the right). We hope you recover soon Joana!”

MHIRT Student Spotlight: Christine Joy Baltazar. Christine is running gels in the lab, and describes procedures: “We ran test markers on the PFGE machine and got better results but we still want it to look better. I did a run with actual samples, and it came out better than the first test I did. I am going to be doing more gels on the PFGE machine this week before I leave for Buriram. P’Ning and I met with P’Non, the person we will be working with in Buriram to collect samples. We talked about the protocols and supplies needed to collect samples. I think I am prepared to collect samples and help in isolating the bacteria to test. With the number of samples that are planned for this project, Dr. Nansara Chantratita thinks that I will only have time to get results from one patient. There are too many samples that need to be isolated; I will be running ten gels on one person so basically 2-3 gels a week until I leave for Hawaii.”

Christine also observed an environmental issue about the use of plastic bags: “One big thing I noticed in Thailand is the amount of plastic they use here. A few weeks ago, as I was scrolling through my social media, I saw posts about a whale dying off the coast of Thailand because of the amount of plastic it had eaten. They give out a lot of plastic here even for the drinks from cafes and booths/kiosks. Mahidol tries to reduce the amount of plastic they use by having recycling bins for plastic, and the 7-Eleven store at the school doesn’t give out plastic bags unless you ask for it. We have tried to reduce the amount of plastic we use by not asking for plastic bags and bringing our reusable bags when we go grocery shopping or when we go to the markets. If we do have plastic bags, we use it as trash bags at home so that we don’t have to get trash bags at the store. Though the plastic they use is small, they use more of it than in America.”

Kenneth Go and Alison Nguyen found that the mall can be for work and play, enjoying a variety of entertainment, and they completed their first DNA extraction. Kenneth and Alison successfully completed their first DNA extraction! Alison continued simulating MRI phantom images on MATLAB. Alison described her work: “To recreate these images, I must write code that controls the image shape, size, location, and intensity. Although coding is becoming more familiar to me, I am finding it to be quite difficult. A challenge that I encountered this week was having to go all the way back to square one to alter a function that was not working with certain inputs. I was finding that this complex code that I created only worked with whole number inputs. To fix the problem, I had to go all the way back to the very first function I initially wrote and find the root of the problem.”

Kenneth reports on his lab work: “I am continuing to observe my cell cultures of keratinized cells infected with Malassezia. I was taught how to use the microscope connected to the computer. It took me over 2 hours to take over 50 photos because of sample preparation, evaluating their hyphae production, taking the photos, and formatting them. I also learned the importance of doing this work quickly because the samples dried out very quickly (see a sample of Kenneth’s photo on the left). Kenneth gets a nicely priced haircut, but pays to use a public restroom! After doing research online, Kenneth goes to “The Cutler.” This “vintage barbershop” provides a one-hour haircut for 300 baht ($9). Kenneth reported that he felt very comfortable and had a head and shoulder massage (nice haircut, Kenneth!). Later at the night market, Alison and Kenneth discovered that there is a fee to use the restrooms. One restroom cost 1 baht for toilet paper, and Kenneth paid 4 baht to use a public bathroom!

Team Liberia: Kianakel Garalde-Machida, Melissa Takaaze, and Brien Huan tried exotic dishes, describing them like a travel food critic, attended a book launch at the university, celebrated Liberia’s win over Nigeria in the World Cup, and visited an ocean town. Melissa continues to enjoy working in the lab, often describing it as "a fun day
at lab.” This week, she is working on dilutions and pipetting onto a plate then comparing optical densities to gauge variability. To create a positive control (and gain additional pipetting experience), she, along with Kianalei, coat an assay plate with a mixture of dog IgG serum and PBS. Then as a follow-up to the plate coating, they add the rabbit anti-dog antibody and substrate and incubate the plate for 30 and 40 minutes.

On the same day that Liberia had a 2.0 World Cup win over Nigeria, Kianalei and Melissa attended Mamawa M. Freeman-Moore’s “A Comprehensive Study Guide for University Freshman Students: Developing Effective Study Skills” sponsored by the University of Liberia Honors Program and held at the campus auditorium. The motivational speakers emphasized the importance of “effective time management” in boosting academic performance. Professor Weada Kobbah-Boley suggested that students use their phones for learning; highlighting YouTube as an educational resource. Abigail Dweh, a second-year honors student, said, “Professor Kobbah-Boley’s speech was inspirational.” Melissa further described the event. “This 3.5-hour program showcased a sampling of the wide range of talent in Liberia, including orators, academics, accomplished visionaries, high achieving students, and creatives. Stephen Cooper, a geology student, shared a touching poem he had written, providing an exemplary example of the multidisciplinary abilities of Liberia’s young people.”

MHIRT Student Spotlight: Melissa Takaaze, the food and travel writer. Melissa’s reports often read like a food and travel critic with her descriptions that evoke the sights and smells of their experience in Liberia. Here, Melissa describes the food at their favorite lunch spot, Identical Friends, where they tried fever leaf stew for the first time. It tastes and looks very much like cassava leaf stew with red palm oil and many, if not all, of the same spices are used. The fever leaf stew differed from cassava leaf stew due to the addition of prawns, which added a subtle brininess to the flavors and colors of the dried fish, fiery peppers, red palm oil, and Liberian spices.” On another day, the Thursday lunch special was groundhog soup, where they see a man on a motorbike drive up to the cook shop, shows the groundhog to Small, Identical Friends owner. Abigail and Saymauklon, Liberian students, specifically requested that Melissa and Kianalei enjoy the groundhog soup, which Melissa described: “One bite revealed a lean, yet tender meat, similar in texture to rabbit. The clean, well-balanced broth nicely complemented the meat by enhancing the meat’s initially delicate flavor and building it to a more complex, subtly gamey, yet pleasant end note.”

Melissa provided a visual description of the weekend visit from the Fendall campus to Robertsport, an ocean town about 50 miles from Monrovia and 10 miles from Sierra Leone. Melissa provided in-depth travel description: “As we exited the city limits, the contrast from city to country was pure sensorial relief as the commotion of the metropolis was replaced by the calm of abundant green shrubbery, fields of cassava leaves and sweet potatoes, and the occasional cluster of homes, small pharmacies, and street vendors. Eventually we left the smoothness of the coastal highway for an unpaved, dirt road, which despite the bumpiness, provided unprecedented views of the grandeur of the Liberian landscape- the understated elegance of birds gliding through the wind, swaying palm trees, tall grasses- which to our wandering imaginations hid crouching lions, hippos, and giraffes- and noble cotton trees rising above the lush green landscape. After many hours on the road, we arrived at Robertsport. In the driveway of Kwepunha Retreat, our accommodation for the night, we were greeted by several neighborhood children- all under the age of 6- who ran up and greeted us as we exited the vehicle. ‘What a wonderful welcome!’

The next morning, Kianalei and Melissa were awakened by the sound of bats. (“Welcome to Liberia.”) Melissa explained, “As is common to nocturnal creatures, the active chatter of the bats diminished to silence as the sun rose, beckoning them to sleep.” They spent Sunday at the beach. Melissa described “…combining for shells and quartz, met friendly locals, visited surfers, hopeful hoteliers, and Embassy officials on holiday; studied air bladders of the algae; and admired the contrast of the distinct layers of black and golden sand. Ultimately, we delighted in the beauty of one of, if not the best, beaches in Liberia, complete with emerald green water, rushing waves, and sand that looked like golden salt crystals. Just behind the shoreline stood leafy almond trees with ripe pods. The locals broke open the pods using a rock,
then ate the sweet nut contained within. Melissa reflected on her experience in Liberia so far that she "is hungry for more of it, and to have time to be in it and to move slowly".

**Team Cameroon**

Booyanudh Jiaram, John Paul Arios (JP), and Yukie Lloyd isolated 200 DNA samples and meet Cameroonian officials wearing newly custom-made traditional outfits. After a bout of viral gastroenteritis (See MHIRT Week 2 Newsletter), Boonya fully regained her appetite. This week she and JP had long days working in the lab from 8:00 AM – 6:00 PM doing DNA isolation on roughly 200 samples! They isolate all of the samples and placed them into a freezer for when it's time to do PCR. The traditional custom-made Cameroonian dresses and outfits are made just in time to wear to a lunch gathering at Professor Rose Leke and Dr. Robert Leke's house where they meet the senator, doctors, and to other high-ranking officials in Cameroon. Boonya reports that they are experiencing "new and amazing things" and are "grateful and appreciative!"

**Laos**

Annalyn “Anna” Oliveros experiences rainy season while progressing on her research. Annalyn described her experiences this week. "The rainy season is about to start so it's been raining every morning but it usually stops in the afternoon. A poncho is a must in this weather. The project is going great! I've been doing a lot of chart reviews and collecting data. It's AWESOME that Dr. Trehan and Diana are always available when I have questions. I noticed with data entry that it's really important to ask all the questions in the beginning because it'll be a pain going through 100 or more charts again just for one type of info. So far most patients are receiving nutrition consultations. From my medical scribe experience, I noticed that the documentation here is kind of lacking. Dr. Trehan did tell me that there are some things that should be documented but isn't. But it's a process. The hospital has 7 years left to get the knowledge they need from the volunteers then it'll be passed over to the Lao government."

Anna reports - Last weekend, I went to the elephant conservation "MandaLao" and it was awesome! The conservation has a total of seven elephants but in my group we had the baby elephant, the mother, and the grandmother. We fed them bananas, watch them bathe, and walked with them through the forest. I wanted to experience elephants in their natural habitat and MandaLao met my expectations. I knew what some elephants went through torture for lodging, performing in circus, and being ridden on by tourist but I didn't want to ride a elephant. Also fun fact, the baby elephant will be the first elephant in Laos to not experience torture, being chained up, used as lodging or ridden by tourist!"

**Daily Life Spotlight: Commuting**

Depending on the country, MHIRT students use a variety of transportation for their weekday commute. Here are some ways that students are commuting:

- **Bangkok:** The Bangkok Transit System "BTS" sky train is used to commute, though it can be crowded with the students describing the chaos as people get into each other's personal space.
- **Laos:** Anna used the "tuk tuk", which is $4-$5 for every ride.
  - **Cameroon:** MHIRT trainees have a driver Uncle J who takes them to work during the week while giving them a mini history lesson during the rides because he is knowledgeable and helpful about his country. "Emmanu" is also another friendly and nice driver. Both Uncle J and Emmanu also take the students when they need ride for necessities at the supermarket and to get food! (Sounds like the Uber!)
  - **India:** Landon walks to work or takes a "rickshaw", similar to tuk tuk in Laos.
  - **Liberia:** Similar to Cameroon MHIRT trainees have a assigned vehicle and their friend and driver Brooks, takes them to work, grocery shopping and weekend activities.

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MHIRT 2018 Trainees Deliver and Participate in Training and Lectures, Run a Lot of Lab Samples, and Take Trips Outside Their Base Cities

Team Cameroon
MHIRT Trainee Highlight: John Paul (JP) Arios: JP was selected as part of the organizing planning team for the annual SEDEMA workshop at the Biotechnology Center (BTC). SEDEMA is a training workshop for local graduate students and postdocs, focused on lab techniques in infectious disease research. The workshop includes professors from Kanazawa University, in Japan. JP and others taught graduate students techniques such as collecting skin swab samples, using the DNA extraction kit, and PCR.

Then JP and Boonya along with their mentors and staff took their experiments into the field for the first time, at Efoulan District Hospital, ensuring that they brought ethanol and DNA extraction kits. In three days, the team collected samples from 51 HIV negative and positive patients. Though the assignment started “rough” because they did not know what to expect, by the third day, they were working efficiently as a team including learning to say “turn around please” in French!

Out of the 51 participants, they found five in the later stages of AIDS, and two of the four patients had Kaposi Sarcoma. Each day, after collecting samples, JP and Boonya immediately returned to the lab to conduct DNA isolation, which takes them about two hours for 90 samples.

JP’s experiences in the SEDEMA workshop and collecting samples in the field has been an enormous learning opportunity both in carrying out the procedures and learning about healthcare access. Organizing the workshop has helped JP learn patience in completing tasks. JP remarked: “I have definitely learned to be patient from this experience and to complete future tasks in advance.” JP also learned that the inability to access medical care or the lack of medical attention results in morbidity and mortality that is generally prevented in the United States. Dr. Loni, JP’s mentor, explained that in rural areas in Cameroon, many AIDS patients come to the hospital at very late stages of the disease, when they can no longer be treated with antiretroviral drugs (ART), which usually prevents HIV patients from full-blown AIDS. ART is not widely available in Cameroon, and not all patients are able to obtain the treatment.

JP and Boonya, after collecting samples, took the Japanese professors out to have grilled, fresh-caught fish at their favorite place, Le Bunker.

Boonyanudh Jiyyaram and John Paul (JP) Arios met local officials: Aside from their field and lab work, Boonya and JP met with officials in Cameroon to discuss about the work they are doing. They visited the Vice Rector of the University of Yaounde I, Professor Jean-Emmanuel Pondi, to describe their research and the cultural projects they are involved in. They also met with the Japan International Cooperation Agency (JICA) officer Yumito Endo to discuss malaria control and prevention in Cameroon.

Team Thailand
MHIRT Spotlight Alison Nguyen. Each week, we have been providing updates on Alison’s MRI phantom image project. This week, her work is covered in more detail. Her work is almost finished, and she will “simply need to add noise to the figure.” She attended a training course for the new MRI machine where she learned to navigate the MRI computer system and how to use the different coils to focus the signal on specific parts of
the body. Alison further described her training: "The most interesting part of this training course was observing the scanning of an actual patient. The technician performed head scans on a patient with a brain lesion. During the first scan, the patient was simply scanned by the machine. However, in the second scan, the patient had contrast medium injected into her blood. There was a huge difference in the image contrast between the two images. Following, the injection of the contrast medium, the image lit up and the contrast between the different tissues in the brain were much more distinguishable."

Alison is enjoying the delicious Thai food, but also misses the "taste of home." I love Japanese curry so when I saw the ‘Coco Ichibanya Curry House’ at Maya Mall, I was very excited. She enjoyed having familiar foods when she found the Coco Ichibanya Curry House. She said, "To my delight, it tasted very much like the curry house back home." Meanwhile, Kenneth Go has been under the weather with stomach issues. After consulting with Dr. Sinda, Kenneth has been resting, eating fruits, reading, and studying.

Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar continue working in the lab, enjoying the sites and sounds of Bangkok, and experiencing BTS delay.

Christine, Jasmine, and Joana worked extracting DNA and running gels. Joana extracted DNA from 28 samples of *Anopheles* cantonensis L5 adults. Jasmine ran a second round of PCR for the Zika virus (ZIKV) NS5 gene to get a higher signal and received the sequence results of the ZIKV Envelope to analyze. Christine ran two gels, cultured additional samples from the previous week and continued with the PFGE process. She felt "amazed and excited" to have run her biggest gel, "30 wells to be exact!" Also, journal club is going well, and they are learning about Burkholderia and its pathogenicity.

Jenny continues her research at the Red Cross with Pich and will review the results section of her paper with Dr. Reshnie Ramautarsing. Jenny attended a presentation by Dr. Michelle Dumat on mental health among men who have sex with men (MSM) and transgender (TG) populations where Dr. Dumat finds that the MSM and TG populations suffer from anxiety, depression, or post-traumatic stress disorder at higher rates than the general population in Thailand. Pich introduced students to Key Populations-Led Health Services (KPLHS) and several projects being conducted at the prevention department and took them to the Rainbow Sky Association of Thailand to observe the task flow.

Joana, Jasmine, and Jenny, with permission, visit Ayutthaya a UNESCO heritage site which was the capital of Thailand until the Burmese army invaded the city during the Burmese war and burned it into ruins in 1767. Thanks to Ajan Paron the trainees rode in style in vans provided by Mahidol University. The remains of the city are now considered as archaeological relics. They visited Wat Mahathat with the headless Buddha, and the Buddha head embedded in a Banyan tree. The Vihara Phra Mondkhon Bophit has the largest Buddha statue in that district. They learned about the city from Ajan Paron, and Ajan Don answered their questions. They saw many attractions and fed the elephants. While there, Jenny also participated in Buddhist practices. Jasmine observed that although the Siamese people had to leave the city, they are still able to bring religion with them. "This just shows how integrated religion and temples are important to their culture, identity, and history."

During this time, Christine visited Buriram via an overnight train ride which she recommends "for the fun of it." The car had full beds with curtains covering each bed. The cars were separated by gender, and P’Ning and Christine slept across from each other. Christine visited the Buriram Hospital which reminded her of rural Philippines. Christine described the hospital as big, just like UH Manoa, with lots of walking around because of its size and it was busy and crowded. She observed a patient and the enrollment process and a nurse drew blood from the patient. Christine also observed her other supervisor P’Non, separate the blood samples into plasma, leukocytes/erythrocytes, and serum then store it in a freezer in another building. It took a few hours for P’Ning
to teach Christine how to use a program that will help her to analyze the gels of the samples that she will be running back in Bangkok. During her free time, Christine continues work on her manuscript and have dinner with P'Non, P'Ning, P'Ning's previous boss and her son gave Christine a tour of Buriram including the football stadium.

The BTS is delayed 10 minutes at each stop, and the students waited for two hours on one occasion because the train was always full. They left the hotel 1 hour earlier than usual! Jasmine explained that this experience has taught her to manage and plan her time better. One BTS train broke down which pushed back the waiting time for the BTS for the whole week. We waited for a BTS for two hours on Monday because it was always so full when it came to our stop.

Team Liberia

Kianalei Garade-Machida, Melissa Takaaze, and Brien Huan learned to share one pipet, continued to enjoy the one local food and observed and participated in more social activities. Kiana, Melissa, Brien and Liberian students Sayma and Abigail coat ELISA plates. The serum samples were divided among the students. They also shared a multichannel pipet among the five of them, and the work took the whole day. On another long day in the lab, the students make the best use of their time while waiting for the pipet. Kianalei studied for the MCAT while Brien provided advice on scholarship opportunities and even gave them a mini-lecture on mosquito-borne diseases.

Melissa and Kiana attended Dr. Varney Kamara’s virology class. In addition to his duties as a lecturer, Dr. Kamara is the director of the veterinary lab where the trainees are based. Dr. Varney led a discussion on how to address the rabies problem and asked students for suggestions. Dr. Varney advocates for a public health approach targeting different settings and groups in the community while incorporating innovative mechanisms. His strategies to address rabies involves vaccinations, public awareness, sanitation and proper trash disposal using smartphones as a platform for communication and education on disease reduction and prevention. Kiana and Melissa along with Saymajukon and Abigail, met with Mrs. Freeman-Moore, a Columbia University graduate, director of the University of Liberia’s Honors Program, and author of the student success skills book (whose book launch was described in a previous update, refer MHIRT Newsletter #4). They discussed the ELISA assay protocol, sites in Liberia they have visited, and other places to visit in the future.

During the weekend, the students left Fendall campus for the hour-and-a-half-long drive to the National Public Health Institute of Liberia (NPHI), located at the former Liberian Institute for Biomedical Research in Charlesvile, Margibi County. They stopped at the beautiful Farmington Hotel. There, security guards inspect the trunk and the underside of the SUV for explosives and weapons before they could enter the premises! The hotel has all the modern upscale western conveniences: gold collings, sparkling chandeliers, ten dollar soup, a shiny espresso machine, flushing toilets, and hand towels. With its lavish furnishings, this hotel stands in contrast to most of Liberia, and often, typical of wealth inequalities seen globally within developing countries. Melissa observes that “extreme poverty evokes deep sadness, yet witnessing such a manifest of wealth relative to the average income of a Liberian citizen was demoralizing. Even more striking was that the guests, despite their privilege, appeared no more, and arguably less happy, than the smiling children in Yama’s Town happily kicking around a deflated and cracked piece of plastic that was once a ball.”

At NPHI they met with Jim Desmond, a veterinarian, who, with his wife Jenny, oversee a chimpanzee sanctuary on the grounds of NPHI. Jim has been able to secure a 501(c)(3) to be economically sustainable for ecotourism. This sanctuary has rescued orphaned chimpanzees from poachers, sellers and those keeping them as pets, whose mothers were killed by poachers for the explicit purpose of captivity or meat.

The students continued their routine of lunch at Identical Friends, never tiring of the food. Kianalei reported, “We are never disappointed when we come to this cookshop.” They eat cassava leaves and pepper soup which was "delicious, delicious, delicious. They also tried another cook shop Belmas with the “best med fish and dry rice in town! So ono.”

The students celebrated Saymajukon’s 22nd birthday, where they were invited to her apartment for a semi-formal ceremony. Abigail, Sayma’s housemate and emcee of the event, gave a short welcoming speech,
had various group members lead an opening prayer, a song, comments, and a closing prayer. Then everyone sang “Happy Birthday” to Sayma. The finger food, prepared by Abigail included fried chicken paired with the subtle sweetness of fried plantains. Abigail’s preparation was appreciated by Melissa describing the chicken as having “a pleasant crunchiness exterior to a soft center that was interlaced with hints of chewiness. The heat of homemade Liberian pepper sauce topped off the salty and sweet flavors by adding a fiery kick to the meal.” Melissa also observed that Liberian culture is more formal including events that are more casual in the U.S., e.g., having book launches, other gatherings, and birthdays. At these “ceremonies” participants actively share through singing, preaching, and other creative ways. Melissa explained, “It fosters the inclusion of, and appreciation for, all group members, while simultaneously honoring the individual.”

Laos
Annalyn “Anna” Oliveros conducts data analysis and plays soccer. Anna focuses on data entry this week. Anna writes, “the computers at the hospital are limited, but she is able to use the MHIRT laptop which is included as part of her supplies for research. Thank you MHIRT. She will be working with the IT person at the hospital to see if there’s a faster way to collect data so that she can analyze it with Dr. Trehan and Diana while she is still in Laos.

Anna Reflect on her week: “Last weekend I played soccer with the women hospital team. Although the last time I played soccer was 10 years ago, it was a lot of fun! I forgot how much I enjoyed playing soccer. I might make it a hobby when I get back home, maybe join a club. On top of that I’ve been watching the World Cup almost every night!”

India
Landon Negrillo made progress in the lab, enjoyed his first Bollywood film, and tried different kinds of street food. After feeling frustrated and depressed last week due to his experiments, Landon is feeling more optimistic this week. (That’s the spirit, Landon! Well, at least the students are realizing now that scientific experiments do not always work. It would not be called research if we can predict the outcome). Landon reports that growing the cells longer paid off as he was “able to see an even greater proliferation of C. elegans” that could be used for his experiments. The C. elegans were distributed into new plates that were streaked with bacteria harvested from the stool of HIV-infected and -uninfected children. The C. elegans within these plates were observed and harvested within 3 days. He adds that “the observations made would either support the hypothesis of microbial translocation happening within the gut lumen and increase the understanding that we have of the process or propose that there is something else that is happening to the tight junctions between the cells”. So let’s keep our fingers crossed for some good results! We are looking forward to it, Landon!

For some downtime outside the lab, Landon’s mentor, Dr. Ravi Tandon treated his students to see a Bollywood movie entitled Sanju. The movie was based on a true story about Indian actor Sanjay Dutt as he deals with drug addiction, name slandering, and his time in prison. According to Landon: “watching Sanju was an interesting experience... because it was my first Bollywood movie and every word, except for the brief moment that he was in America, was in Hindi. It was like piecing together a puzzle of someone’s life. I had to look at the relationships between each character, their body language, and the emotions invoked in the audience to understand the movie”. Landon also got to try some street food as recommended by other students from Dr. Tandon’s lab. Although all were very satisfying, one dish specifically stood out for him: golgapa/pani puri which is basically a fried puffed ball made of flour filled with what can only be described as spicy water, potato and sprouted mung beans. He capped off his week by reconnecting with his family back home by doing a Facebook livestream with them and reflecting how his first month of being in India has been.

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MHIRT 2018 trainees learn how to cook local food, love the local food, and describe their routines after hard and often long days in the lab

Team Thailand

Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar continue to work on their PCRs, participate in journal club with MHIRT Bangkok trainees and continue to enjoy the Thai culture. Christine is in Buriram, where at the hospital, she observes the interview enrollment and agreement process with patients and blood draws. Supervisor P’Non showed Christine how to perform the latex agglutination assay for B. pseudomallei and separate the blood samples into its designated tubes to be saved for later tests. On another day, Christine with her supervisors collected samples at patient’s homes, about 2 hours away from the hotel, spending about seven hours between the patient’s house and the rice fields. After the samples were collected, they visited the patient and his spouse at the nearby hospital, bringing them fruits as gifts. They also gave his relative milk for allowing the team to collect samples around their home and rice paddies. Christine described her field experience, “I really enjoyed being in Buriram! The rice paddies remind me of my dad’s home in the Philippines while the cows and water buffalos remind me of my mom’s place in the Philippines. There isn’t much to do here as far as activities, and it reminded me so much of the Philippines that I could enjoy living here or at least visit again. Working in the hospital made me love science even more. Getting to be with the patients and working with clinical samples made me interested and curious to learn more. I also enjoyed collecting samples in the field and around the patient’s home even when it was really hot and humid. We had to be sheltered from the sun. Being in Buriram was the best part of this project, and I have learned so much from being there.” She observed how differently the hospitals accommodate patients compared to America. In Buriram, many patients stay in one room, and sometimes there are patients outside the door. Because of the distance to the hospital, patients come with family members who also stay at the hospital. People bring their own fans with them because there is no A/C and the crowded rooms have no circulating air. Christine concludes, “Health care is free to Thai citizens, so it made sense that the hospitals were extremely crowded.” Christine has time to sightsee around Buriram where supervisor P’Non rode on one of the bigger elephants. Christine described this experience as “being happy but definitely scared on the inside.” They also visit a flora park and walk through flower exhibits. Here in Buriram, Christine observed that mopeds are not locked, which would be a fantasy for the moped robbers at UH Manoa.

Joana and Jasmine continued their work at the Mahidol University on perfecting their PCR assays and were happy to see bands on the samples that were thought to be negative, and Joana also ran two successful PCR assays. Joana explains her project and delivers the information on her article, by Rutchanee Rodpai et al. entitled “A. cantonensis and A. malaysiensis Broadly Overlap in Thailand, Lao PDR, Cambodia, and Myanmar: a molecular survey of Larvae in Land Snails,” and as Joana described, “Joana did really well.” Kenneth from Bangkok also presents a paper at the journal club over Skype. His presentation was on an article by Hao Li et al. entitled “Skin Commensal Malassezia globosa Secreted Protease Attenuates Staphylococcus aureus Biofilm Formation.” Lauren Ching, an UHM Abraham Kagan MD Endowed Fellowship recipient and graduate student from the UH Department of Tropical Medicine, arrived in Bangkok at midnight on Sunday and was picked up at the airport by Dr. Pornsawan. She will be conducting research on Zika virus diagnostics along with Dr. Pornsawan. More on Lauren’s research project in the next newsletter.
MHIRT Spotlight Jasmine Padamada: Here is a week in the lab for Jasmine. “This week, I finished up the rest of the gel extractions for the Zika NS5 gene. I also re-did the second round of PCR assays for the envelope gene in a couple of samples in which the sequencing results weren’t clean. Then sent the samples that underwent gel extraction for the envelope gene for sequencing and analyzed the results for the sequences we got back from the first batch. At the end of the week, I started working with the samples that were PCR negative for the envelope gene. It was important to adjust the protocol because all of the samples were already found to be positive through another diagnostic test. In order to sequence the samples, they need to be PCR positive as well. On Friday, the adjusted protocol resulted in bands in some samples, so I plan on using that protocol this week. This made me really happy because I learned that research involves a lot of trial and error before you start to see results.”

Jasmine also learned about the significance of the Thailand National Anthem, which she heard the school children next to their hotel sing every morning. However, on one occasion, Jasmine heard the national anthem playing at the BTS train station. “It was a good thing that I recognized the tune from the elementary school next to my hotel because I immediately stopped walking. Everyone else on the train stopped too to pay their respects, regardless if they were in a rush to catch the train for work. The security guards also did a salute.” Upon doing more research translating the lyrics of the national anthem, Jasmine found that it is a song that describes uniting the Thai people to their land, identity, and each other.

Jenny continues to analyze data at the clinic. Like Jasmine, Jenny also experienced cultural and national respect. She reported that upon going into the office at the beginning of the week, she felt that “she did not get the memo” because she saw that everyone was wearing yellow. Later, she learned that people wear yellow to show respect during the King's birth month since the color of the monarchy is yellow. Wearing yellow is required for officials but optional for public workers unless there is a specific dress code for the job.

Alison Nguyen and Kenneth Go continued work in the lab, with late nights which motivates them to learn to cook popular Thai dishes. Because Kenneth has just received the lipase detection assay kit, he is trying to get as much done with the little time there is left, with several late nights. To meet his timeline, he cultures more keratinized cells and several more strains of Malassezia. However he was “extremely disappointed” to find that there was contamination in some of the flasks, which has not been an issue, and “proved to be a huge inconvenience. Instead, on July 4, he spent over 7 hours centrifuging the same samples with Vivastin to insert into produce a concentration of 0.5 mL, finishing the lab work at 7.00 PM, and not being able to celebrate the day with a restaurant and a 4D movie. Instead, he has a smaller American meal at McDonald's. He continues in the lab the following day, leaving the lab at 10:00 PM, but reports, “An initial, superficial analysis of the results seemed promising, so I’m hoping that all is well.” Kenneth also presents on the paper that Dr. Sirinda has given him on fungal-bacteria “inter-kingdom” interactions on the skin. (See previous section on Bangkok and journal club.)

Alison begins experimenting with the contrast in the MRI images and with the noise levels. She and Dr. Suwitt figure out a code that would effectively simulate the noise that is in the original image. Her next step will be to use the established levels of contrast to build a user interface to assist the volunteers in navigating the task.

Alison and Kenneth visited the Smile Organic Farms Cooking School where led by their instructor the “incredible” Rutta, they learned how to cook four popular Thai Dishes: Pad Thai, Tom Yum Soup, Panang Curry, and Spring Rolls. Alison found the preparation to be “fairly simple” especially since she does not consider herself to be an “experienced cook.” The spring roll filling and the sauce for the Pad Thai use similar ingredients that include oyster, soy, and fish sauces and palm sugar. They learned that all the ingredients are from nearby farms. They also made curry paste and were sent home with a recipe book where Alison will recreate some Thai dishes for her family.

Kenneth, who is a “huge fan of all types of tea,” spends his weekend along with Alison on his cultural project. He visits Araka Tea Garden 1.5 hours away to the Mae Tang District. Charlie, their guide teaches them how to properly discern green tea leaves perfect for harvesting. Kenneth describes the visit and what he learns: “The young, curled leaf remains that way just for a few days before fully opening and no longer being able to be harvested. Because this optimal window is so brief, workers harvest the tea leaves every single day. It is so crazy that a group of 8 foreigners only managed to gather 300 gm of green tea leaves while an individual farm worker is
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Landon Negrillo is making good progress in the lab, although less so with his yoga practice. In the lab, Landon cultured more *C. elegans* with the stool samples from children with and without HIV, seeing a definitive difference on how HIV affects our body. After conducting qPCR assays on his cultured *C. elegans* and possibly a western blot, he will compare all of the different types of *C. elegans* that has been harvested with a sample *C. elegans* cultured with laboratory-grown *Escherichia coli*. Landon explained, "We are hoping to see if there are any differences within the RNA of each of the *C. elegans* cultures that I grew. If not, then western blot will be conducted to test our suspicion that the bonds between the proteins within the mucosal layers are being split." Landon reported on the progress of his work, as assessed by Drs. Ravi Tandon and Ashwini Kumar Ray. "The closer I am to reaching the end of my time here in India the more excited that I get as I witness all the pieces of my research falling together." Drs. Tandon and Ray met with Landon to plan the rest of the experiments that Landon will perform before he leaves. His mentors said that the rate at which Landon is accomplishing his projects, there will be time to discuss his report with them and also have some free time too!

Landon offered do’s and don’ts advice for anyone traveling to New Delhi. He recommended visiting the National Museum of History along with the India Gate as they are “magnificent places to visit and they make for great photos.” The museum has an extensive collection of artifacts with the oldest pieces dating back to 5000 years. He recommended the audio tour which mentions how yoga is related to each deity and Buddha that resides within Indian History. "This makes it a lot more satisfying as I have occasionally been practicing Yoga since I arrived here in India." The India Gate is a war memorial with names of various Indian and British soldiers who participated in WWI and holds the Amar Jawan Jyoti. Landon found the arch, designed similar to the Arc de Triomphe in Paris, an “amazing sight to see along with the families playing in the nearby park." Landon also provided some do’s for travel in India. He recommended traveling in groups; particularly with someone who is familiar with India and can speak Hindi. Because he trekked alone, he witnessed ways that tourists can be taken advantage of, such as being overcharged for auto rides and street food or being followed to buy and pay for services, e.g., forcing photos to be taken. Landon said that bullies are universal, and even in very nice places. Landon learned to travel smart, with advice that is universal: "Always be cautious towards your surroundings and try to stay safe whenever you are traveling."

Team Liberia
Kianalei Caralde-Machida and Melissa Takaaze had a girls’ visit to the market, and along with Brien Huan had a good week in the lab. Kianalei and Melissa reported that they had an "enjoyable" and "productive" week in the lab. They continued the ELISA assay by coating the plates, adding the primary antibody, then the secondary antibody, and then analyzing and graphing the results. Melissa described the procedures in detail: "Via flicking, we removed the blocking solution from the plate, performed a one-time wash with PBS, then temporarily put the plate aside. From there, we calculated a two-fold dilution series (i.e., 1/200, 1/400... up to 1/3200) to include a different IgG dilution on each of the five plates, and thereby serving as an additional control." Because they obtained results that they were not expecting, they learned how to problem solve: "So instead of using 1% PBS-BSA, we will now use 2% PBS-BSA."

The trainees toured the Liberian Institute of Biomedical Research and where they learned more about the specimens they handle. They found the equipment and machines “up-to-date” and "impressive. They may also do side projects with mosquitoes which Kiana described as, "Very exciting!!" This week Kianalei and Melissa visited more local markets. Mrs. Freeman-Moore, the director of the Honors Program, along with Saymajukon, Abigail, and Brooks, ventured forth for "an immensely fun Gals Day Out." They visited Habel’s, a supermarket that they have not been to, and explored the aisles which are brightly lit with a wide selection of food and household items. They found the market an "exciting place to explore...overjoyed to discover the amazing ice cream selection" that include Ben and Jerry (though they will have to save for the $10 splurge). Najib, the gracious owner of the market, introduced himself, and an employee brought each a piece of cake! Across the street from Habel’s, is a busy, crowded, and loud open-air
market with many vendors – some with tables, others selling produce and merchandise from blankets on the ground. Melissa described this market as “full of smells—some pleasant like that of fresh greens; others less desirable like that of putrid fish.” Melissa and Kianalei enjoyed how the market hit all of their senses such as seeing the array of foods and people moving at the same moment, the smell of fish, wet earth, and car exhaust; and the “utterances and clamor of the crowd.”

Kianalei and Melissa learned, after admiring Abigail’s pretty A-line skirts, that her sister Priscilla is a professional seamstress (and university student). First, the students selected and bought lapa, a traditional cotton cloth used to make a variety of distinctive Liberian clothing. They did this at the Waterside shopping district where there are “hundreds, if not thousands of lapes of different colors, patterns, and designs, at booths and specialty stores.” As can be common when not familiar with selecting fabrics and designs, they found the “vast assortment of designs” to be overwhelming because of the overload of choices. Upon finding several lapes suitable for skirt-making, Priscilla visited Kianalei and Melissa on another day for measurements.

MHIRT Spotlight: Kianalei Garalde-Machida. Kianalei is especially enjoying the local food, and often provides keen observations about both the food and cultural interactions. Here, she describes how the Liberian food is superior compared to foods they are accustomed to: “Melissa and I are adapting to the culture fairly quickly. Liberian food is our go-to here, not only because that’s all we have, but because we love it! Cassava leaf is so one, especially the way Identical Friends, a cook shop across from campus, prepares it. We did go through some episodes of craving other ethnic western foods, but restaurant prices are just high as the United States! We’ll pass on western food, pass the Liberian food please.”

In the last MHIRT Newsletter (#5), we reported on a birthday party of labmate Sayma that Kianalei, Melissa, Brien, and Dr. John Berestecky attended. Kianalei provides further observations of the event from a cultural standpoint: “The party was very VERY formal.” After being in “shock” because Sayma’s roommate Abigail who served as the party emcee volunteered Kiana to say the opening prayer, Kiana was also asked to sing Sayma a song of her choice. Kiana reported that Brien was asked to say the closing prayer, and the formal ceremony ended with the guests being invited to share kind remarks about Sayma. Brien and Dr. Berestecky delivered nice messages. Kiana observed: “It was very different from an American birthday party, but it was a great experience.”

Team Cameroon
Boonyanudh Jiyarom, John Paul (JP) Arios, and Yukie Lloyd left Yaounde and visit Doula and Kribi, where the seafood is plentiful and delicious: JP, Boonya, and Yukie go to Doula: After 4 hours on the road because of the congested single lane roads, they arrived at Doula which they found to be “completely different from Yaounde.” There was a lot more gray (concrete) as opposed to the red/brown color (dirt) in Yaounde. “Upon arriving they ate at “La Pizzeria” where the food was “amazing.” They make sure to take advantage of being closer to the sea and order a seafood pizza! The next day, they explored the markets and practiced their bargaining skills, then they left for Kribi. It was a 3-hour drive to Kribi where the scenery changes from “concrete jungle to actual jungle.” They saw “green plants everywhere” and “an entire stretch of palm trees where many of the locals harvest palm oil.” They also had great seafood dishes there. The next day, they met Louise and his family for the last full day of the trip. Once again, they ate more seafood for lunch, this time “mountains of grilled fish, giant prawns, and crawfish!” Afterward, they relaxed at the beach and played beach volleyball with Louise and his family. They also make sure not to get into the water (another MHIRT no no) The students are now back in the lab in Yaounde, where they hope to finish Boonya’s project by next week at the latest! They also sadly learned that one of their very enthusiastic study subject was no more with them.

Laos
Annaly “Anna” Oliveros is gaining speed with data entry and details her daily routine in Laos. Anna reports on her work: “As you know, I’ve been doing data analysis on the data collected from the inpatients at LHFC from December 2017 to now. I am been getting better at speed, and it’s great that Dr. Indi Trehan got me remote access so I can do data entry at home.” Anna also provides us with her out of work routines, which we
detail here, and highlight in the next section below. This is what my day looks like: “I wake up at 6:30 AM to get ready by 7:00 AM to eat breakfast at my Gold River Guesthouse. The breakfast includes coffee or tea, variety of cut up fruits, crepe, toast with butter and jam, and a choice of scrambled/sunny side eggs, fried rice or Lao noodles. After breakfast I take the tuuk tuuk to the hospital which takes about 10-15 minutes depending on traffic. Every morning between 8:00 and 8:30 AM, we meet to discuss case studies. For lunch, I eat at the hospital’s café. The fried rice is probably my favorite. Since, I hardly eat rice at home, my mom would be so proud of me. After work, I take the tuuk tuuk back to my guest house. For dinner, I eat out with a bunch of falamg volunteers and ‘falamg’ means people not from Lao. Since food here is pretty cheap, it’s going to be difficult for me to eat out when I get back home. So far, I’ve been trying different restaurants in town but there is this “Pad Thai” lady who I’ve been to multiple times because her food is delicious! It’s the best ‘Pad Thai’ I ever had. One of my favorite Lao foods is Larb and sticky rice. Before bed, I’ve been reading this book The Spirit Catches You When You Fall: A Hmong child, her American Doctors, and Collision of two doctors. This book was recommended by Diana (PA with a background in nutrition) and it’s about the struggles of a Hmong refugee family from Laos and their interactions with the health care system in Merced, California. I’m still in the beginning of the book but so far, this Hmong family has been having a difficult time due the language barrier with the doctors at the hospital while treating their daughter who has multiple episodes of seizures. This is a great book to read before coming to Laos to understand the Hmong culture”. (Good choice Anna on this excellent book that depicts the interaction of culture, concept of health, and health care!)

**Post Work Routines:** Over time, MHIRT students establish a daily weekday and weekend routine including lunch routine and activities after a hard day’s work in the lab. Here are typical student activities when they are not working in the lab.

**Thailand:** Jenny, Joana, Christine, Jasmine, Alison and Kenneth often go out to eat at the wide variety of restaurants in the city and try out various cuisines. They have eaten dinner at Terminal 21 for udon, a Thai shabu shabu and yakiniku restaurant, a Thai and Japanese fusion restaurant, and sometimes grab and go items from 7/11. After dinner, they may pick up items at the store (Tescos) and watch TV or YouTube videos before going to bed. Occasionally their hosts invite them to dinner after work. They are vivid movie watchers and watched recently released Incredibles in 4D, exercise at the gym, and get Thai massages! They explore the nightlife such as the shopping malls and night markets.

**India:** Landon also eats out for lunch and dinner. Lunch is usually at a nearby hostel or canteen either with lab fellows or on his own with a good book. Dinner will be at the guest house, out, or food delivery. His downtime outside of work is spent reading, on social media with friends, or playing Nintendo switch. He also continues his cultural project of yoga practice including taking classes at the Jawaharlal Nehru University sports complex.

**Liberia:** Kianlei, Melissa, and Briene have their lunch at cookshops, usually Identical Friends, but sometimes at other places (Belmus). In previous newsletters, the delicious food at Identical Friends has been described. The students also enjoy the food at Belmus where they are “huge fans” of the grilled fish and dry rice. They also tried the cassava leaf stew, a mix of the dried meat, fish, and chicken with pounded cassava leaf under a “layer of decadent red palm oil.” They compare this typical dish with their usual version at Identical Friends, finding that Belmus’s version is spicier and glossier in color than Identical Friends.

**Lao:** Like almost all of the MHIRT students, Anna’s routine includes lunch and dinner offsite with regular venues such as the hospital cafe for lunch and the variety of restaurants for dinner. Anna also has her regular favorites for dinner such as for the best “Pad Thai” she has ever had. Her evenings are spent winding down, like other MHIRT students, usually with a book.

**Cameron:** If JP and Boonya are able to leave the lab early, they along with lab mates also get dinner out at one of the many international (Korean, Chinese, American, etc.) restaurants in Bastos, a quarter in Yaoundé. They also have a favorite restaurant called Le Bunker where they eat freshly grilled fish. Weekends are spent quietly relaxing or going on activities that Louise organizes. They have played volleyball at a high school and explored the neighborhood with Richard, Professor Leke’s cousin. Finally JP and Boonya also get in some exercise with a quick morning workout to make up for all the food they are always eating!

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MHIRT 2018 TRAINEES TRY TO FINISH UP THEIR WORK IN THE LAB WHILE STILL EXPERIENCING THE CULTURES OF THEIR LOCATIONS

Team Cameroon

MHIRT Spotlight: Boonyanudh Jiwarom. Boonya reports that this week, she had full concentration on her project. Nested PCR (nPCR) was a lot of work and because they only have one working gel machine that only had 22 wells per gel (see photo on the left of JP loading samples on the gel). Furthermore, along with the lab air conditioning being down and having to work in the hot room, Boonya remarks, "I have learned how to work patiently and persistently when there are not a lot of things provided." The limited availability of equipment included not having a mask but using fashion glasses instead when she used the trans illuminator to visualize the gel. She had her mentor Livo, visualized for her. On the brighter note, Nana, the PhD student who is working with JP on the skin microbiome/HIV project, came over to teach Boonya and JP.

Boonya describes an eventful weekend. “Over the weekend, we visited the home of Bernard, a local news reporter, and close friend of Louise. During our visit, we discussed many things and asked him many questions regarding Cameroon. He was very knowledgeable about the division and discrimination between the Anglophone and Francophone regions currently occurring within the country. Bernard also took us to his older brother’s home where we were able to play some ping pong and pool. We were so happy to be able to meet Bernard’s four children. Bernard named his children after different cities and countries around the world due to his love of traveling. Here is a picture of me with them!”

Custom made clothing is popular in at least a couple of the places (also Liberia) where MHIRT students are working. In MHIRT Newsletters #3 and #4, we reported on the students’ custom made traditional Cameroonian outfits, and they visited the tailor again to make more! Boonya explains that the Senagalase man Mansoon “makes garments for high ranking officials such as the first Lady of Cameroon, and also Professor Leke! Mansoon and his team are very skilled! We were surprised most of the people sewing and tailoring are male! I cannot believe how this domestic skill seem to be so talented in men here! We have also made some aloha shirts with Cameroonian print for our loved ones.”

Boonya also describes the weather this time of year in Cameroon. As I am writing this to you it has been raining cats and dogs for 3 hours straight and the power just went out. Due to the heavy rain, the house is also currently leaking from almost every corner and room. There is also no water at the moment. I hope that the electricity comes back on soon so that I can send this email! The weather here has been in the rainy season, so it is fairly chilly at night and the early morning. JP and Richard (Professor Leke’s cousin) go running together around 5:00 AM and describe to me as being so cold that you would want to run and build up the body heat. In the afternoon time that is when it gets the warmest, probably around 80°F.”
Boonyanudh Jiyanom, John Paul (JP) Aries, and Yukie Lloyd learn how to cook traditional Cameroonian soup, and attend a birthday celebration. As part of JP’s cultural project, the trainees learn how to make Mbongo Ichobi, an African black soup with many spices, vegetables and with the protein choice of fish or beef. The creation of the dish included shopping for the ingredients at an outside market called Mokolo where they were called “atangana” frequently, as Boonya explains, “an equivalent to Hawaii’s word “haole” meaning foreigner.”

This week the students’ good friend Louise one of the lawyers of the BTC lab celebrated his 39th Birthday! Louise has been instrumental in coordinating Boonya’s cultural project and finding a school where they could play volleyball, and the students are “extremely grateful.” His birthday party was hosted at his house. Like house parties in Hawaii, “There was delicious, home cooked foods, drinks, music, entertainment, and cute little children playing in the yard. A LA SANTE (Cheers to health)”

Yukie is leaving Cameroon this week. Boonya comments: “JP and I will be extremely lost without her, in terms of both languages and guidance. We became a family here in Cameroon and are so happy that we were chosen to have come with her as part of the Cameroonian team.” Thank you Yukie for your continued contributions in Cameroon and for the MHIRT program!

India
Landon Negrillo learns western blot technique, communicates virtually with his mentors, and experiences a minor bug bite. Landon explains his work: “I have been working on the western blot portion of my project and taking notes on ways to improve my western blotting techniques.” He has been staying in the lab until 8:00 PM converting RNA to cDNA. Unfortunately, Udendo and others are not in the lab this week to explain the next steps of his experiment. Preeth and the other Ph.D. students allowed Landon to continue on the other half of his project, using a western blot to detect protein bands. With this we could find the proteins that contribute to the tight junctions found in the stomach lining. He spent a whole day researching the process of SDS-PAGE and western blotting. Landon has been diligently recording all of the components of the necessary solutions and modifications to the procedure. At the end of the week, he was able to take the membrane to the “dark room” to develop a film that would reveal if the proteins that they are testing for are present, but unfortunately, no protein bands were visible. Landon will consult with Dr. Tandon when he returns to the lab on Monday.

Last weekend, Landon noticed a rash on his elbow and got it checked by the school nurse, who prescribed an allergy medication. Then after consulting with Dr. Tandon over the phone, Landon traveled to the nearby hospital where the doctor diagnosed the rash as a bug bite and prescribed an anti-itch cream.

Team Thailand
Alison Nguyen and Kenneth Go continue making progress in their work and try Iraqi cuisine. This week Alison built a user interface using the MATLAB’s graphics program to create a window for the figure she is working on. As with most projects and what her fellow students also experience, problems arise when she is not able to connect the graphical design with the code she created. Alison plans to consult with Dr. Kittichai, who Alison describes as “very good at building user interfaces, and we plan to work on fixing my code.”

Alison and Kenneth tried Iraqi food (for the first time), part of the variety of cuisines in Chiang Mai. She ate chicken curry with roti and Kenneth devoured a plate of seasoned chicken kebabs. He found the food "so flavorful" that they plan to return. The waitresses also wore traditional garments with very intricate designs.
Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar continue on their respective projects, and prepare presentations and reports, and continue to experience Thai culture. Last week Jasmine’s PCR results were successful, and she is planning on using a modified protocol on the rest of the negative PCR samples. However, some of the DNA gets “stuck” in the wells, and she started making cDNA from RNA for some of the samples beginning this week. Other than that, she worked on gel extractions for the positive samples. She also worked on her presentation for the final Journal Club.

Christine cultured the environmental samples from Buriram and ran another sample of PFGE gel, which had not turned out well before she went to Buriram. This time the gel turns out well! Also in the lab, Christine taught one of the interns how to do a PFGE and make plates.

Jenny worked on her manuscript the entire week and was able to complete a draft of the results and discussion sections. (Great progress!) She also began working on the abstract and biography, which is required for MHIRT abstract book that will be disseminated next month. Finally, she will consult with Dr. Reshmie and discuss her progress.

The students continued to explore their cultural projects and sites by visiting the Grand Palace and temples Wat Phra Kaew (Emerald Buddha, Wat Pho (Reclining Buddha), Wat Arun (Temple of Dawn), and Asiatique. One thing that caught their attention was the intricate designs of the buildings and statues. Jasmine said, "the intricate designs of the buildings and sculptures are eye-catching with white as the main color and yellow/gold and red as secondary colors." Floral designs were also prominent (especially with Wat Arun).

The Buddha statues were also placed in the center showing its importance and sacredness compared to everything else in the surrounding area. At the Grand Palace, the trainees found that leggings were not considered conservative attire, even though they were acceptable at the temples. They purchased skirts for 100 baht from across the street so that they can tour the Palace.

The students did more shopping for souvenirs at a gem store, Jim Thompson Factory Outlet Store, and Chatuchak Weekend Market while still learning the art of haggling. They found that they are still not experienced hagglers because they do not know what a reasonable price for an item would be! As an addition to our report on daily routines (See MHIRT Newsletter #6), the trainees also have a routine of eating breakfast together on weekday mornings. Even in Bangkok, they have a “favorite Mexican restaurant” in Terminal 21.

**MHIRT Spotlight: Joana Garcia:** This week Joana traveled to Nan, which she describes as “an extraordinarily beautiful place.” The rain created mist resulting in “beautiful clouds that actually make the valleys and farms we passed eerily beautiful.” She enjoyed the architecture of the villages where each house is unique. Joana described the houses: “it’s not like the US where you find houses that are virtually identical, here they’re so different as if they have their own personality.” There were also many live animals, such as dogs, oxen, and chickens.

For her research, Joana is working with the livestock, endoparasites, and rat teams, the latter is the focus of her project. The study involved microscopes and sterilized equipment at a small clinic manned by wonderful and welcoming people. “Because I dissect lung tissue to isolate parasites my corner always has flies, bees, and weird fly/bee hybrids that are attracted to my shampoo and conditioner. Every morning we meet at 5:30 AM to check the lines we put in the forest and community for rats, and visit certain villages where my ayan has spoken and worked with the chiefs, and he has a relationship with the hunters as well. We asked the community to put traps in their home, and for the hunters to put traps deeper into the forest. We’ve had Angiostrongylus positive rats this past week, along with a large rat that had huge..."
lungs flukes whose cyst had caused necrosis in the lung tissue."

Joana has a few concluding remarks about her work and time in Nan: "It has been a great and fulfilling week although hiking on O'ahu has not prepared me for hiking in the Nan rice fields." And another comment: "They tell me I smell like Tom Yum because my repellent has the same ingredients, and I find that so funny."

**Team Liberia**

*Kianalei Garalde-Machida, Melissa Takaaze and Brien Haun* have long but very productive days in the lab, debate over whether cassava leaf or potato greens soup was better, and fry plantain donuts in attempts to make the popular delicious snack.

The days were VERY long but very productive. The students ran their first MagPix experiment. Kianalei reports, "We ran a 1:200 dilution series on all the sera EBOV-VP40, SUDV-VP, and MARV-VP antigens showed the strongest activity compared to the other antigens. While the MagPix was being run, at 4:45 PM it clicked that the electricity would be turning off at 5:20 PM. We went into a mode of panic because there was still always to go until the MagPix was finished reading. Fortunately, the plate finished by 5:00 PM. The security guard switched to the generator, and we were prepared to run our second plate." They then plug the data into Prism where they "played around with different graphs, altering little things here and there to find the best representation of their data. It took awhile to configure the duplicates into the Prism format, but eventually, they were able to compare the MFI’s of the 7 antigens." In addition to the MagPix experiment, the students coated plates and ran an ELISA at a dilution of 1/200, making "small-small" (Liberian slang) modifications to the protocol.

The students also had a "fun fun fun" day when two visiting students visited the lab. One student was from Georgia State University on a study abroad program in Biology, and the other student was from the University of Liberia interested in research. While they were waiting for the MagPix to read the plate, they played history trivia where Melissa asked them history questions about both Africa and the US. Kianalei confessed that not only did she get most of the African history questions wrong, she also did not get too many questions correct on the US. "This made me realize I need to get back to the books and refresh myself."

During their usual lunch at Identical Friends, a debate ensues over whether cassava leaf or potato greens were better in soup. Being that Melissa has eaten potato greens, many days in a row, this is her favorite, while when asked by Ma the wife and co-owner of the cook shop what soups they want, Kianalei always requests the cassava leaf soup. They, along with John, Sayma, and Abigail voted on their favorite, and ending up in a tie down the middle.

Kianalei and Melissa also learned that to make perfect fried plantain, the plantains need to be left to ripen (and not put in the fridge as they were doing to keep the ants away.) Since they already have the refrigerated plantains, they breaded and fried them, creating a donut type plantain, which was delicious, but still not as good as the classically fried plantains.

The trainees visited Benjamin Korah, Dr. John Berestecky’s son in Coca-Cola, a community surrounding the Coca-Cola Factory to have lunch; called “dinner” because it is the largest meal. On their property is a well where Mrs. Korah (Ma Korah) kindly showed Kiana and Melissa how to collect water, which Melissa found “extremely exciting!” They met the friendly neighbors and enjoyed the company of the “energetic and sweet neighborhood children.”

Other numerous weekend activities included visiting Congo Town to see Liberian art; dinner at Brook’s house in Cooper Farm, and Wata’s home in Fendall to watch the World Cup. Highlights included having no electricity at Brook’s
property. During daylight, they checked out the sights that included a piggery and a traditional African kitchen. In the evening, they merely enjoyed uninterrupted conversation being “aware and mindful of changes that occur in the transition from day to night, the moon rising in the sky, and the glow of fireflies.”

Melissa described a meeting with local people who inspired her compassion, and passions for health equity and social justice. A second chance meeting in the market with Josephine who is highly intelligent, motivated, independent, and kind. Melissa also met with a mother of a sick child. Sadly the mother cannot afford the medical tests and medicine. These encounters inspired Melissa to observe, “There are hundreds of thousands of other Liberian children who are also smart, capable, and kind--who deserve access to clean water, sanitation, quality healthcare, education, and the opportunities necessary to have a fulfilling and compelling future--just as many in the developed world do.”

Laos
Annalyn “Anna” Oliveros works longs hours to complete her project. Anna has been working 12-hour days (8:00 AM – 8:00 PM) entering data so that she can finish her project in the short time she has left there. This work has taken up much of Anna’s time and we will provide more updates from Laos in the next newsletter.

Oh, the weather!!
Most of the MHIRT trainees are experiencing summer monsoon weather in the Northern Hemisphere. Their early reports often describe the extreme heat and humidity, but they are getting used to the tropical climate. At the same time, the weather and its effects continue to be a big part of their experiences and reports. Here we share how the weather affects the students’ day-to-day life, sometimes even changing their plans.

India: Landon is in the midst of monsoon season, sometimes experiencing power outages where he is not able to do work on his computer (and get his MHIRT reports in on time. He still is able to do so, and we thank him despite the power limitations!)

Thailand: Jasmine and Jenny have gotten soaked from the unexpected rains when walking, while Christine describes the weather as very rainy and hot and humid. Thunder and lightning have prevented Alison and Kenneth from going out to dinner on at least one occasion!

Cameroon: Though it is the rainy season, Boonya remarks, “We are fortunate to have come during this season where the weather is fairly cool and nice except for the occasional heavy rains that can sometimes cause power outages. Our bedrooms have excellent airflow, and sometimes it gets extremely cold at night.” Refer to page 1 for additional report by Boonya on Cameroon weather.

Liberia: Liberia is currently in the midst of rainy season which runs from May-Oct. Kanaali and Melissa have mostly experienced sunny weather, and showers are intermittent, frequent, and “manageable, requiring nothing more than a basic umbrella.” Drainage issues however “create huge puddles that require navigational agility, sure-footedness, or waterproof shoes when walking.” The trainees’ favorite lunch shop Identical Friends got flooded recently (see photo on the right). Sumo, the owner and his family evacuated, and the red dumpster got washed away! The owners are now “persevering and doing their best to clean up and recover from the flood” including having identical friends back open for business.

Laos: Ann reports, “The weather here is similar to Hawaii but it’s soooooo humid here! Yesterday, the sun was out and it was a really beautiful day. Today, it is pouring rain. When it rains here, the electricity at my guesthouse will sometimes go out for a few hours. It’s a must to have a poncho here. For the most part the weather has not gotten in the way of my activities. I was able to do a hike this past weekend and it only poured on us when we came back down from the hike.”

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COUNTDOWN BEGINS! MHIRT 2018 TRAINEES FINISH UP THEIR RESEARCH AND CULTURAL PROJECTS, BUY OMIYAGE BEFORE THEY LEAVE, WHILE PROVIDING RICH OBSERVATIONS REGARDING THEIR COUNTRIES AND CULTURE

Team Liberia
Kianalei Garalde-Machida, Melissa Takaaze and Brien Haun have a quiet week, buy souvenirs and prepare for returning home. Brien reports, “Friday we repeated the sample dilution series. Overall the MFI was greatly reduced and the best dilution on this run was 1/400. I am beginning to suspect that something is degrading through the nightly and weekend long power-shutoffs.” Other lab activities included John Young from the Liberian Mission spending a day videotaping the lab interviewing Team Liberia. Video link: [http://manoa.hawaii.edu/tropicalmedicine/?page_id=3770](http://manoa.hawaii.edu/tropicalmedicine/?page_id=3770). USAID officials also toured the veterinary lab. For variety, the students visited Belinus to dine on fired fish and dry rice. At the same time, the trainees were happy that Identical Friends was able to be back in business after the flooding (See MHIRT Newsletter #7). Melissa commented: “Salvageable items have been drying in the open air. After lab one day, the trainees drove to Congo town to search for a souvenir shop. Kiana bought an assortment of hand-carved animal figures, Melissa bought a carved box with “Liberia” stamped on the front, and Brien bought variety of masks. Other than the small trip to buy souvenirs, there were no planned activities, and Kiana and Melissa relaxed catching up on MHIRT work, did household chores, and cooked banana pancakes at home.

Laos
Anaylin “Anna” Oliveros works with data and does outreach at a remote village. The data that Anna is working on is from December 2017 to July 2018. Anna reflected in the massive amount of data: “it amazes me how many patients are seen in the inpatient department here at LFHC.” She goes to the hospital daily to input data because the Internet is faster at the hospital. In addition to the research, Anna had the opportunity to tag along with the outreach team and experience home visits because the villages are a three-hour drive from the hospital. Though the roads had potholes and windy, “like the road to Hana, Maui, Anna remarked that she luckily did not get car sick.” At the village not all homes had flooring, and the ones who do are considered more well off. They enjoyed lunch with a family who served spicy food, which Anna enjoyed! Anna described the weather as similar to Hawaii, “but it’s extremely humid here! When it pours”, and a poncho is a necessity. Though the rain sometimes affects electricity at Anna’s guest house, it has not gotten in the way of her activities, and she is able to enjoy outdoor activities such as hiking.

Team Thailand
Jasmine Padamada, Jenny Nguyen, Joana Garcia, and Christine Joy Baltazar finished up their projects, and visit Chiang Mai. Christine reported that she had another busy week in the BSL lab. She conducted mass spectrometry on environmental samples from Buriram. Because this is a lengthy process, she was able to run downstairs to get lunch and get back up really quick to continue working. Her diligence paid off because her work was able to confirm that the samples were contaminated with the pathogen. Christine learned how to
infect and treat cells at different time points. "We did over 100 samples and retested many of the samples. Interestingly all the samples tested were positive for the suspected pathogen. Doing Mass Spectrometry was a lot of work, but it was effortless to learn. I hope to be able to come back to Thailand again and do more work with the suspected pathogen."

Jasmine was given 4 more samples to work on. Her total now is 39. She redid the PCR for the samples that had "messy sequences." She also did gel electrophoresis extraction for the samples that had a positive band. She found that one of the 4 new samples was PCR positive for ZIKV. She further found, "by synthesizing new cDNA from previous samples that had been difficult to work with, I found none of them were PCR positive. I plan on doing modified PCR for the samples that had no band for the NS5 gene and doing gel extraction on the ones that had a band.

Jenny continues to analyze the data and met with Dr. Rashmir and received comments on the discussion section of her manuscript. Jenny is currently compiling her manuscript using the drafts of each chapter. She then received feedback from Dr. Rashmir, and continued to polish her manuscript for the rest of the week. (Classic and persistent manuscript development!). Christine continued her cultural project while visiting Chiang Mai, to compare shopping between Chiang Mai, Bangkok and Buriram. "One major difference with shopping at the markets in Chiang Mai is that haggling in Chiang Mai is more difficult than in Bangkok and Buriram. The people in Chiang Mai are more secure and tough on their prices compared to the people in Bangkok and Buriram who are more willing to haggle with the customer." Christine was surprised that haggling for prices in Bangkok resulted in better deals than in Chiang Mai.

Jasmine continued her cultural project in Chiang Mai by visiting the Wat Phra That Doi Suthep temple. She observed that "This temple and statues of Buddha were very similar to those in Bangkok. In fact, the temple also had a smaller model of the Emerald Buddha and the Reclining Buddha." The biggest difference was the Hinduism influence, which showed "similarities between the two religions and how they are able to harmonize with each other. The temple also observed that in Chiang Mai there are many green areas even though car pollution is extensive. The presence of these natural wet environments made the air moist and fresh that was a good change from dry air and constant heat." Jenny further described some of the differences between Bangkok and Chiang Mai:

1. "Surprisingly, people in Chiang Mai drive more cars than mopeds and a large number of red taxis substituted for the lack of a train. There were also fewer tuk-tuk!
2. Chiang Mai is definitely more rural with less tall buildings and more greenery and "has more space for nature reserves such as elephant sanctuaries and the zoo."
3. As Christine observed for her cultural project, Jenny also concluded that - "it was harder to bargain compared to Bangkok and not much cheaper at all."
4. "The weather in Chiang Mai had a little more rain and wind while Bangkok was sunny in the morning and gloomy in the afternoon as well as a bit more humid."

Jenny also found that "Chiang Mai was like a breath of fresh air, just what I needed. It reminded me a lot of Vietnam. However, it felt nice coming back to Bangkok." The students attended journal club where "Everyone did really well and it was interesting to see how everyone had accomplished through this internship." They were able to meet Drs. Pornsawan and Mr. Chung for dinner at a Thai BBQ shabu shabu all-in-one restaurant. Joana continued her work in Nan. She goes to bed at 9:30 PM wakes up at 5:00 AM every day. In the field, they set up fewer traps than last week and trapped more rats from inside villagers' homes. She found one rat that was infected with Angiostrongylus that involved the rat's heart and an Angiostrongylus positive rat whose infection was entirely in its heart. Additionally, she found a positive Rattus exulans, which had never been documented as a carrier for the nematode in Thailand. Additionally in the lab, Joana used three computer programs, as well as BLAST to trim, align, and clean the genetic sequences she obtained from the field finding that morphology of one sample was like A. cantonensis nematode, but whose genome was of A. Malaysensis species. Professor Satch Morand, a leading scientist on the trip, worked with another scientist from the
university and created a 15-minute documentary so that the locals could see their work, especially the rat specimens. The video also features a clip of Joana slipping and falling in a rice field! She also reported that her aunts would like to start a collaborative project with her and the University of Hawaii The group ended the week “playing tourist” by visiting and watching traditional silk making and seeing “the most beautiful temples I had ever seen in my life.”

Joana summarized her week: “It was a truly wonderful experience I am so grateful that I was able to participate in this project. I was the only one consistently attacked by mosquitoes, but otherwise, this week was uneventful.”

MHIRT Spotlight: Lauren Ching: Lauren joined the MHIRT Bangkok team as a 2018 Abraham Kagan, MD Endowed Fellowship Awardee. Dr. Kagan led the Honolulu Heart Program, a research project, which studied thousands of men of Japanese ancestry to see how differences in lifestyle affected rates of heart disease and stroke. The groundbreaking and impactful results from this project have been used to guide physicians in treating heart disease worldwide. Lauren is an MS student in the Department of Tropical Medicine, Medical Microbiology and Pharmacology.

Lauren arrived middle of the night at Bangkok airport on July 19th and was happy to be greeted by Dr. Pornsawan. Next day morning after a somewhat squashed and humid commute on the BTS, she arrived at the Mahidol University to be joined by Jasmine and Christine. Lauren’s lab work focused on Zika and Dengue viruses. Here she described her work: “Over the past week I used our laboratory developed flavivirus assay to test nearly 200 archived samples collected at the Phetchabun Hospital between 2004 and 2005 from patients who presented with DENV-like symptoms; however, they were PCR negative for DENV. We are working on analyzing the data to determine if any samples need to be re-run or examined further, to ensure that I complete all the wet lab I need in the final two weeks I have in Bangkok. Preliminary analysis is promising, indicating several of these samples show reactivity to ZIKV IgG antibodies.” This week, Lauren left her short time in Bangkok, and Dr. Pornsawan Leangwuiwong hosted Lauren a farewell party!

Alison Nguyen and Kenneth Go also finish up their projects and greeted MHIRT Bangkok students. Kenneth continued his “string of late nights” with the earliest he’s left the lab was 6:00 PM, often staying past 9:00 PM. Kenneth is looking forward to finishing up measuring the lipase activity in the remaining strains. Alison was able to finish building the user interface in Matlab. She and Dr. Suwit discovered that they needed two more tools for Alison’s user interface before she would be able to run the program with the volunteers.

Kenneth’s lab visited Wat Phra That Lampang Luang, a Lanna-style temple revered for the multiple structures within the temple. Kenneth was raised Catholic, and described the worship ceremony as being akin to a Catholic observance where they participated in a prayer walk holding 3 candles each. It also turns out that the temples had statues of the “ox”, Kenneth’s Thai zodiac animal! He hopes this brings him luck in his project! Kenneth described the experience and his gratefulness: “It was so incredibly enriching for me to take part in and understand a religion other than my own. I’m incredibly grateful to my lab mates for allowing me to accompany them, and I’m blessed that MHIRT gave me this opportunity to partake in such unique cultural experiences.”

Kenneth found Chae Son National Park to be “picturesque.” He was also surprised to see that the natural hot springs are not used for bathing. Rather it is common for locals to bring bamboo woven baskets filled with quail eggs and chicken eggs to cook in the hot springs water! “The unparalleled scenery coupled with the Thai food and the fresh, soft boiled eggs made for a picnic, unlike anything I’ve ever experienced.” They visited a waterfall, and Kenneth made sure not to enter the water to prevent infection.
The MHIRT Bangkok students met up with the Chiang Mai students! They started the day early to visit an elephant sanctuary, which is Alison’s cultural project. Jenny and Alison suffered from motion sickness. At the elephant sanctuary, they observed the elephants eating and bathing, and they were “gentle giants.” There were 5 elephants at the camp, including a pregnant elephant and a baby elephant! Alison remarked, “Watching the elephants was an unforgettable experience.” The group also visited Doi Suthep for Jasmine’s cultural project and Chiang Mai’s night market for Christine’s cultural project.

Team Cameroon
Boonyanudh Jiyarom and John Paul (JP) Arios. Boonya described her cultural project, which was to investigate education at the primary level at a private school called Parent National Education Union School (PNEU). She explained that due to the lack of educational support from the government, parents are responsible for paying the tuition. MHIRT Newsletter #2 covered the Hawaiian cultural education that Boonya and JP provided to students. Boonya further detailed that their cultural training included asking students questions to see if they were paying attention and then giving them the opportunity to ask Boonya and JP questions. The Cameroonian students were awarded Hawaiian souvenirs (keychains and macadamia nut chocolate) that Boonya had brought with her as a prize for answering the questions. Boonya commented, “My experience from the first day is something I greatly value because I was able to share knowledge and joy about my home to the children while they shared their youthfulness and innocence to us.” Boonya and JP also participated in the school’s closing cultural ceremonies where each school student introduced themselves in their mother’s tongue while wearing their tribal attire from different regions of Cameroon. “JP and I found the performances very entertaining and fun.” The ceremony ended with student awards for best attendance record, highest academic achievements, and cleanliness for each class level. Boonya reflected on the ceremony: “The students here possess proper manners, curiosity to learn and a drive to achieve their goals that exceed many standards found throughout schools in the United States. Their awareness and knowledge about the world and the government were far greater than what I expected from primary school students.”

India
Landon Negrillo works frantically to finish his project while preparing in other ways for his departure.

Landon stimulated THP 1 cells with the bacteria harvested directly from the stool samples. Because cells did not adhere to some of the walls, they waited 3 days before analyzing the bacterial lysate. Landon admitted that the rainy weather has begun to affect his motivation. He has been disappointed with the data but hopes that once Dr. Ray returns, he can discuss his results and have a clearer understanding of his experiments. Landon explained, “The experiments for the THP-1 are really down to the wire as it takes 3 days for the cells to adhere to the plate and another day for them to be stimulated and undergo the whole process leading up to qPCR. The final results will be further discussed with Dr. Tandon, but I’m hoping for the best.” Landon has recorded his results to be compiled into a data chart with the other sequences that they ran to find out if the last data set was a fluke or the actual product.

Landon also continues to complete his lab book and has begun writing his paper. He has started working on the abstract. Drs. Tandon and Ray and Landon have begun to compile all of the data they obtained into graphs so that they can be included in Landon’s presentation and paper. Landon feels like he is running out of time to complete his project, and remarked: “What once was a 9-to-5 weekday job has now become a hectic 9-to-5 job for almost every day of the week.” His lab mates announced the dates of their departures for holidays. To push through, Landon would go to the nearby Starbucks or work at his guesthouse desk hoping that he will get a different perspective than at his lab desk. Another way that Landon is preparing for his departure is to “stockpile” his favorite Indian snacks for omiyage for his family and friends.

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MHIRT STUDENTS RETURN SAFELY TO HAWAII! THANK YOU MENTORS AND STUDENTS!

Message to MHIRT international mentors and students:

Aloha Mentors. We greatly appreciate the guidance you provided to the MHIRT trainees whom we are proud of.

Aloha MHIRT Students: Whether you were working in your mentors’ labs, participating in cultural activities, eating at all the local food places, and making local friends, you were great ambassadors for America, Hawaii, the UH, and the MHIRT Program.

Students were asked to send one photo that best represented their summer research and cultural experience. Here are their photos and comments.

Alison in Chiang Mai
This summer, I was able to see the world through a different lens. The research project that I was working on helped me to learn more about the work that is being done to advance medical technology. Learning how to program in two months was a difficult task that developed my appreciation for those who work in computer science fields. My experience living in Chiang Mai also helped me to reconnect with food and nature in different ways. Learning how to cook Thai food and trying new dishes every day expanded my flavor palate and taught me how to use a variety of spices. This trip also involved excursions to see the caves or the elephants that allowed me to see the beauty in nature. Overall, my stay in Chiang Mai expanded my knowledge about research and enriched my life in many ways.

Boonya in Cameroon
My research experiences made me grateful for the things I have taken for granted in the US. Electricity is extremely valuable especially when you are running a PCR or extracting DNA. I was fortunate that the electricity did not go off during the experiment, but it went out intermittently. Supplies are limited. I had to be extremely careful not to use too much. Unlike in the US where institutions provide funds for research, Cameroon researchers lack the financial support. Lastly, the students were able to be motivated by their drive for science even with scarce resources. These overall experiences have supported and driven me even more to continue my passion for scientific research.

Anna in Laos
My research in Laos was an experience that I will never forget. I worked in a NGO hospital – Lao Friends Hospital for Children (LFHC). I was a little nervous before arriving to Laos due to my zero knowledge of nutrition, but if I could, I would love to extend my stay. My mentors Dr. Indi Trehan and Diana Culbertson were amazing. If I did not understand something, they did not hesitate to break it down for me. I learned a lot during my stay. My favorite topics in malnutrition are Beriberi and Kwashiorkor. The local and volunteer hospital staff were so nice and made me feel welcomed. Being in a very limited-resource hospital gives me a greater appreciation of what I have. Lastly, my cultural project consists of the elephant sanctuary and learning to cook with a Lao employee of LFHC. I was able to compare my Filipino culture with the Lao culture.
Landon in India
For 8-weeks, I was at the Jawaharlal Nehru University (JNU), New Delhi, India doing research on HIV and its effects on the gut microbiome. My time abroad was an eye opening experience. I was in another country that I’ve never been to, and I was traveling alone. Learning how to grow *C. elegans* and learning other techniques kept me intrigued during my time. Outside of lab, my body was pushed to its limits as I was studying yoga. Whether it was the yoga class on campus or following YouTube videos, I tried my best each day to learn what I could. The most impactful part being the International Yoga Day event.

Jasmine in Bangkok
This is a photo of me with my lab mates on my last day at work. It is with this team that I was not only able to finish my project but was also able to create a stronger connection to Thailand. Without them, I would have trouble with sequencing the ZIKV envelope gene. They also gave me a list of temples to visit for my cultural project. The temples were truly a sight to behold in-person. I am thankful to the MHIRT program for allowing me to gain a once-in-a-lifetime experience and tested the boundaries of my comfort zone. Overall, I learned that I should treasure each moment because everything goes by too quickly.

Christine in Bangkok
I am forever thankful and blessed to have been able to be a part of this research experience for the summer. I have been able to learn many new techniques that will allow me to expand my skills to better my future research experiences. I have been able to grow mentally as a young adult in order to travel aboard for more research work in the future and even for pleasure. The skills that I have made improved not only my work in the lab but outside in the world as well. I have learned countless things about myself and research that I will take with me throughout my life.

Joana in Bangkok
My research study trip to Thailand is memorable. Not only did I get to work on a project I had been working on in Hawaii, but I got to learn so much from my teachers, the students in the lab, and it was all so amazing. My ajarns wanted absolutely nothing but my growth and happiness, and it made the experience unimaginably wonderful. Even though the experience was only for 2 months I met people I will be surrounded with, support and be supported by, for the rest of my life. There is truly no better feeling. I am honored without words to have been part of this experience that has helped me grow confident as a researcher while deeply and innately changing me to my core. (Picture with 5 of the wonderful students I got to go on my research trip to Nan)

Jenny in Bangkok
For the past 8 weeks, there was a perfect balance between cultural and research experiences. On weekdays, I would be at the Thai Red Cross AIDS Research Centre from 9 AM to 4 PM. working on my manuscript from the project data that had already been collected and analyzed. I was able to learn so much including the impact of HIV and AIDS among men who have sex with men and transgender women. I also shadowed physicians in the clinics to observe lymph node biopsies. Besides my cultural project that required me to take a Thai cooking class, I had daily cultural experiences. Finally I got to know fellow MHIRT students better, and met kind new American and Thai friends.

Kenneth in Chiang Mai
This entire summer was about opening myself to new, enriching experiences. Working in the lab full time was entirely invigorating yet challenging because I had no prior research experience. Every day it became a priority for me to learn and understand what I was doing that day. *Malassezia*, the most dominant skin fungus, are lipophilic yeasts that I was fortunate to work with. In addition to culturing the yeasts, I proved able to culture and infect them into keratinized cells, which we later used to measure and compare the enzymatic activities. By the end of my time in Chiang Mai, I became more confident in my lab abilities, and I embraced that things never really go as planned. During the weekends, I was blessed and honored to immerse myself in Thai culture, which included my favorite activity of respectfully visiting temples.
**JP in Cameroon**
The eight weeks that I spent in Cameroon will be something I remember for the rest of my life. Many of the people I met there made such a huge impact during my short time there. Conducting research in a developing country posed many challenges that tested my patience. At the same time, these challenges disguised itself as an opportunity to work on essential skills necessary to excel in research, e.g., problem-solving, communicating, teamwork. Living in the US, we are fortunate enough to have convenient food shops with pre-made food when we are too lazy to make meals. In Cameroon, cooking and food are taken seriously. So much care, attention, love, and spice go into each meal despite how tedious. I enjoyed every single meal I had there, and I wish I could have brought home some ingredients to cook with.

**Kiana in Liberia**
Summer 2018 was a novel experience for both the John A. Burns School of Medicine and the University of Liberia. "Team Liberia" was able to study serodiagnosics for Ebola, a rare and deadly disease in people and nonhuman primates, in the former epicenter of the West African Ebola Crisis. We were able to collaborate and perform good work, despite the language barrier and limited supplies/resources. Although the infectious disease outbreak was detrimental, it was also infectious in the sense that researchers all around the world wanted to get involved and tackle this disease for the sake of humanity. Liberia cannot do it alone; it needs helping hands from other nations in order to prevent another outbreak. Our serodiagnosis experiment may seem miniscule in the field of Ebola, but it has the potential to contribute to the knowledge surrounding the disease.

**Melissa in Liberia**
Living and conducting research on Lassa virus serodiagnostic assays in Liberia was a vibrant, beautiful, challenging, and thoroughly humbling experience. Liberia's limited infrastructure was initially daunting. Our lab lacked running water for hand washing, power shut off at 5:00 PM. Yet for these and many other reasons, it is inspiring to realize the degree of research and contributions achieved through the resiliency of our team of Americans and Liberians in less than two months. Imagine what could be accomplished in six months or even a year! When resiliency is combined with evidence-based research and cross-cultural partnerships, it becomes a driving force in the development of effective solutions to a myriad of addressable issues, disease prevention and, public health programs and education.

Although the students are back in Hawai'i, MHIRT 2018 is not over. Since Thursday, August 2, 9:00 AM all the way through Friday, August 10, they are attending daily Post-Travel Workshop. During the workshop, students will share their experiences, analyze and graph results, learn to write a scientific manuscript, compare health disparities here and aboard, think about "life after MHIRT", prepare video presentations, and finalize plans for the E Ho'oulu Haumāna presentation. See you then!

All family, faculty and friends are invited to attend E Ho'oulu Haumana on Friday, August 10th, 5:00 to 8:30 PM, Sullivan Conference Center, UH Cancer Center. At this student-led program, MHIRT students will present their research and cultural experiences. Please send RSVP by August 6, 2018 to Laarni (sumibcay@hawaii.edu).

We are very thankful to everyone who participated in the MHIRT Program this year. Without your help MHIRT 2018 wouldn't have been a success. Refer to the next page for acknowledgements.

All MHIRT newsletters are archived on our website.

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- Jose Barzola
- James Campbell, PhD
- Steve Case, MPH
- Sandra Chang, PhD
- David Clements, PhD
- May Rose dela Cruz, DrPH
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