



Mahidol University
Faculty of Tropical Medicine

Trop. Med



Annual Review 2012



Mahidol University Faculty of Tropical Medicine

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AN INTERVIEW WITH THE DEAN

If one word could summarize the achievements of the Faculty of Tropical Medicine of Mahidol University, it would be *adaptation*. **Dr. Pratap Singhasivanon**, the Dean of the Faculty, knows that today's world is a very different one than that seen 50 years ago, at the time of the Faculty's establishment. "The public health scenario is constantly changing. So consequentially, we [the Faculty] cannot be static. Our research, the work that we do, and the training we provide – all of these evolve as the environment around us changes. We must perform our duties based on the needs of the people."

As opposed to what was seen in 1960 when the Faculty was founded, today is a world in which you can travel almost anywhere within 24 hours. There is increasing urbanization and over-crowding in cities. There are widening societal disparities and varying access to health care. There is an increasing encroachment of humans on nature and the result is a convergence of humans and animals living together. All of these factors grant mobility to microorganisms. "As people and commodities move, so do microorganisms," says Dr. Pratap. "This requires us to *adapt* our current methods quickly, to be able to detect and react to disease in real time."

ADAPTING THE DEFINITION OF TROPICAL MEDICINE AND THE APPROACH TO TROPICAL MEDICINE RESEARCH

The scope of tropical medicine has traditionally focused on infectious diseases. However, what we are seeing more and more evidence of is that this scope is becoming too narrow. In recent years, people living in the Tropics have come to have a much higher quality of life and life expectancy. While the burden of some infectious diseases is now stable or decreasing, chronic non-infectious diseases are on the rise. "People in Thailand are dying from cancer, from diabetes mellitus, from heart disease," says Dr. Pratap. "We cannot confine ourselves to only infectious-disease research anymore." And as WHO and SEARO are taking measures to re-define what is considered within the scope of "tropical medicine," Dr. Pratap has encouraged the Faculty to adapt and change.

"However, we cannot forget who we are," says Dr. Pratap. That is to say, the Faculty has always been first and foremost a research institution for infectious diseases, and it cannot abandon 50 years of such expertise. However, adapting that expertise will allow the Faculty to expand to infectious agent-related chronic diseases, such as cholangiocarcinoma.

Additionally, current trends in tropical medicine academia are using new perspectives to solve problems. As demonstrated at this year's Joint International Tropical Medicine Meeting (JITMM 2011), the theme of "One World - One Health" is becoming increasingly important. Zoonotic diseases, such as helminthiasis, leptospirosis, and toxoplasmosis are more frequently affecting human populations. Many other emerging and re-emerging tropical diseases are being transmitted by human-animal-environmental interactions. The Faculty strives to adapt to these issues and unite veterinarians, bioscience researchers, clinical doctors, environmental officers, nurses, public health officials, and all other medical experts to address these diseases.

Furthermore, as climate change becomes more severe and natural disasters continue to occur, we must consider how environmental factors contribute to disease. Thailand recently recovered from the most widespread flooding it has experienced in decades, which resulted in sixty-five provinces being declared disaster zones. The Faculty reacted swiftly, participating in both flood relief efforts and taking pre-emptive measures to investigate the potential for flood-related disease outbreaks. This quick action exemplifies the response necessary for tropical-disease control efforts in today's world.

“If one word could summarize the achievements of the Faculty of Tropical Medicine of Mahidol University, it would be adaptation.”



EXPANSION AND ACHIEVEMENTS IN 2011

This past year saw the Faculty organizing two very important research conferences, the annually-coordinated JITMM, and AIDS Vaccine 2011, which was for the first time held in Asia. These meetings brought together world-class researchers from countries all over the world.

The Faculty also enjoyed a number of research successes: the patented invention of therapeutic antibodies against dengue by CEAR; the start of a promising dengue vaccine trial in Ratchaburi by the Department of Tropical Pediatrics; the creation of a new febrile disease clinic at the Hospital for Tropical Diseases; and the establishment of a cohort of over 5,000 Bangkok schoolchildren to monitor febrile disease outbreaks.

Further advances were also made in 2011 in expanding the Faculty's capacity for research, both in terms of human resources and training. Administrative scope for grant management developed with the establishment of the Office of Research Services, and growing recognition of the importance of bioinformatics prompted the Faculty to develop a Master's curriculum in the subject.

LOOKING FORWARD

2012 is already shaping up to be an eventful year for the Faculty. The construction of the new 22-floor Center of Excellence will be complete by the middle of the year, providing space for the expansion of the Hospital for Tropical Diseases and for new clinical research.

Dr. Pratap believes the Faculty is changing to offer a “new breed of TropMed.” And, although he encourages embracing new concepts and adapting, he also knows the Faculty will not lose sight of who they are. “The Faculty of Tropical Medicine is unique because of our focus,” says Dr. Pratap. “We have such a large variety of disciplines: clinical research, basic science research, community-based research, and policy-based research. All of these combine and have allowed the Faculty to lead in shaping and impacting public health policy. As long as we know who we are, what we do, and how to move together as a Faculty, we will continue to excel.” It is this uniqueness that facilitated the success, expansion, and adaptation of the Faculty in 2011. This Review is a testament to those achievements.

“As long as we know who we are, what we do, and how to move together as a Faculty, we will continue to excel.”

EXECUTIVE SUMMARY

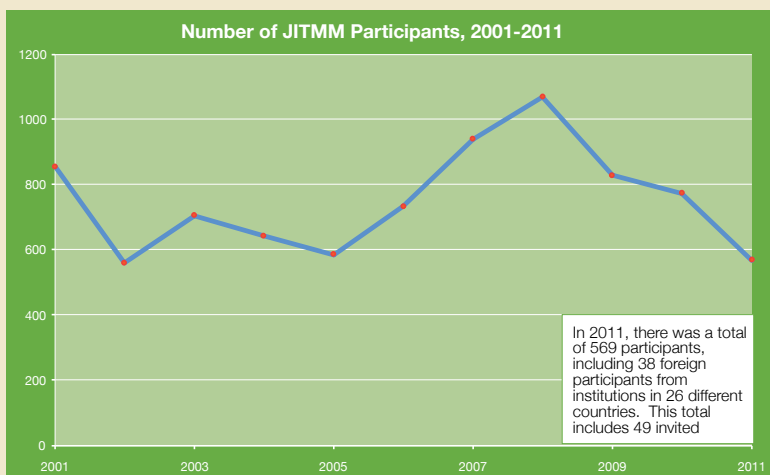
Assoc. Prof. Jitra Waikagul

Deputy Dean

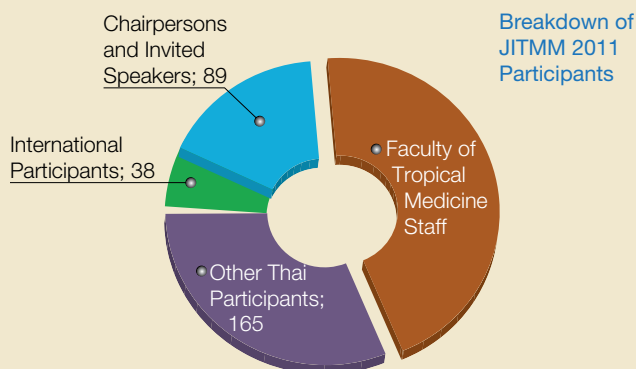
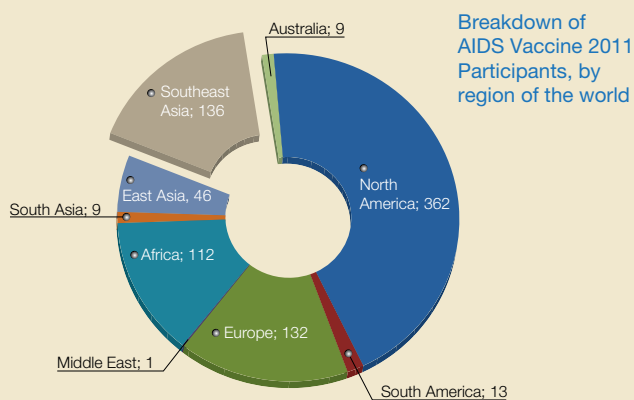


"The Faculty of Tropical Medicine is currently the leader in publications for tropical diseases, but that does not mean we have reached our fullest capacity. In the future, we will see more 'megaprojects,' involving multi-national collaborations. With the opening of the new Center of Excellence in 2012, our Hospital will expand its ability to treat and provide services for patients. In education, I hope to see an increase in the number of students, as training the next generation of tropical medicine researchers is crucial. And I also believe that the **Joint International Tropical Medicine Meeting** will continue to grow and become more international each year and more conferences, like the **AIDS Vaccine 2011**, will find Thailand and the Faculty a suitable host."

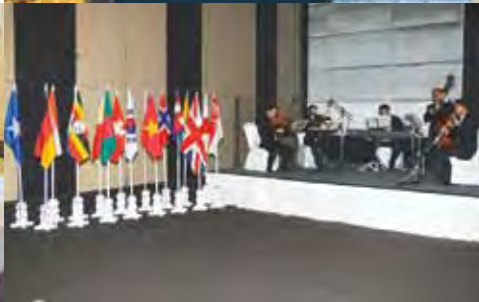
Conferences



AIDS Vaccine 2011 was held on 12-15 September 2011. There were 820 participants from 45 different countries. The conference was chaired by the Dean of the Faculty, Associate Professor Pratap Singhasivanon, and co-chaired by Professor Punnee Pitisuttithum. In an auspicious occasion, the opening ceremony was graciously presided over by **Her Royal Highness Princess Maha Chakri Sirindhorn**.



JITMM 2011 was held on 1-2 December 2011. The Faculty had an income of 3,041,363 THB and all JITMM costs amounted to 2,094,969.65 THB. The net profit was 946,363,35 THB. There were 539 participants from 26 different countries. Under the theme "One World – One Health," attendees participated in 34 Symposia, and learned from 118 Oral Presentations and 76 Poster Presentations



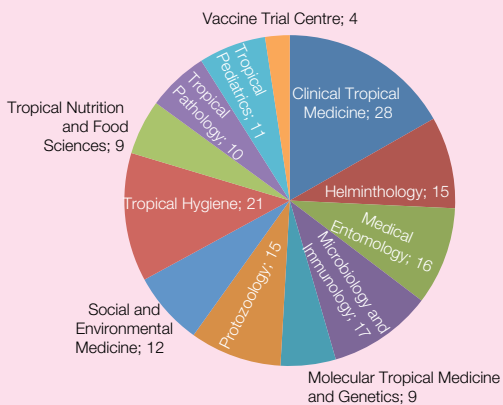
Research

Asst. Prof. Pongrama Ramasoota

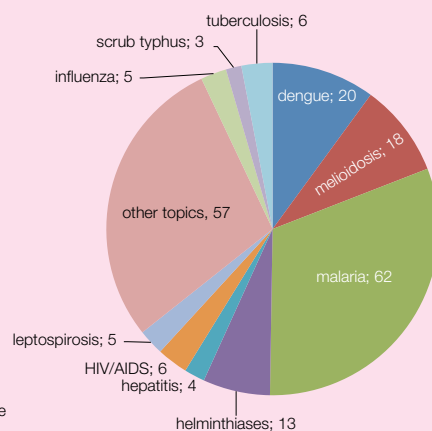
Deputy Dean for Research



Number of Research Projects at FTM, by Department



Number of TropMed publications in 2011, by disease



“Research has always been the backbone of the Faculty of Tropical Medicine and 2011 was a year of major accomplishments. And the continued support from and expansion of the Office of Research Services is only strengthening the Faculty’s capacity for excellence in research.”

Education

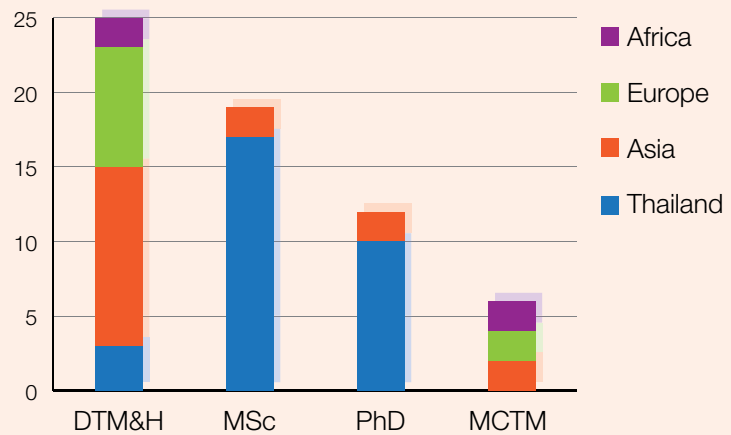
Assoc. Prof. Waranya Wongwit

Deputy Dean for Education



“As the Deputy Dean for Education, I am lucky to have had so many challenges. We have been working hard to reform the curriculum and have recently received accolades from the Office of Higher Education Commission for our DTM&H program. We have a steady enrollment rate for students and become more culturally diverse every year.”

New Students in 2011, Separated by Country or Region of Origin



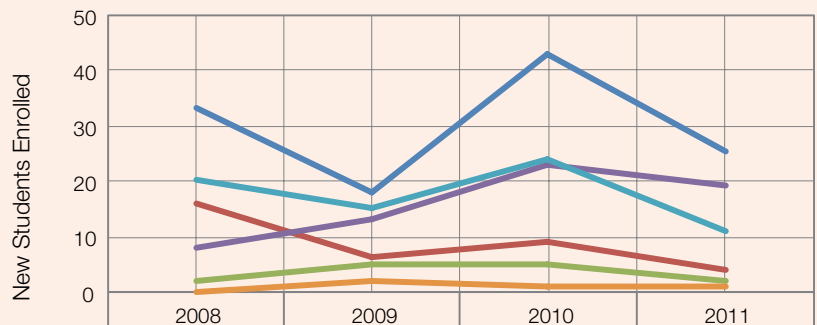
Asst. Prof. Chotechuang Panasoponkul

Deputy Dean for Student Affairs



“When new students come to Bangkok, it is my job to help them live here happily. I tell them the ins and outs of life in Bangkok and about Thai culture in general. And the various activities my office schedules build a ‘TropMed family,’ relationships that students will keep and benefit from in their future careers.”

New Student Enrollments in 2008-2011



Program	2008	2009	2010	2011
DTM&H	33	18	43	25
MCTM	16	6	9	4
MCTM (TP)	2	5	5	2
MSC	8	13	23	19
PhD	20	15	24	11
PhD (CTM)	0	2	1	1

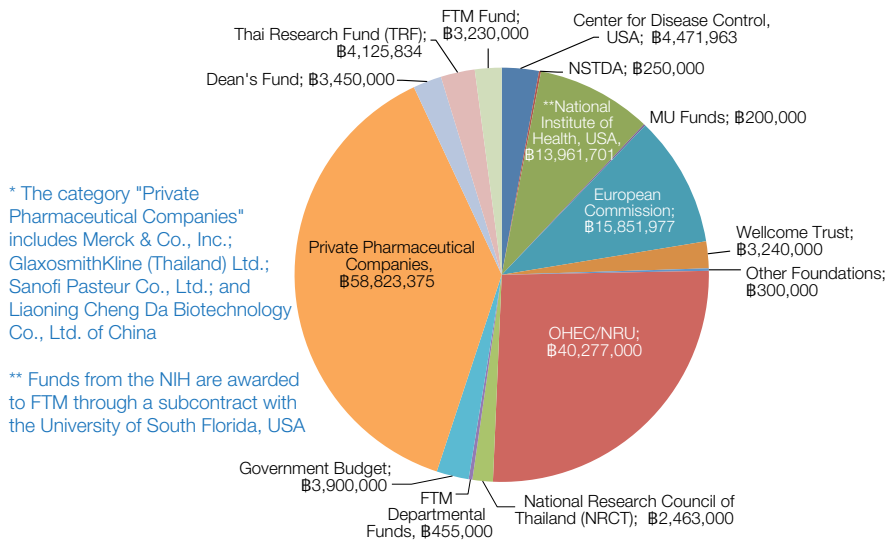
Finance

Assoc. Prof. Porntip Petmitr

Deputy Dean for Finance and Assets
Management



Funding Received for New Research Projects in 2011, by Funding Source



"During 2011, our overall generated income was about 205 million baht, and overall expenditure was around 165 million baht. This left around 40 million baht to distribute among our Departments. Each Faculty receives a standard budget of around 4 million baht and will allocate a budget to each department for that year from this amount. One department may get more, and one department might get less, this depends on each department's annual performance results and rankings within the University. Departments which have exceeded their performance agreements may receive more of a budget. Our three main sources of income are the Hospital for Tropical Diseases, research work, and other additional services."

Collaborations

Prof. Sasithon Pukrittayakamee

Deputy Dean for International Cooperation and Networking



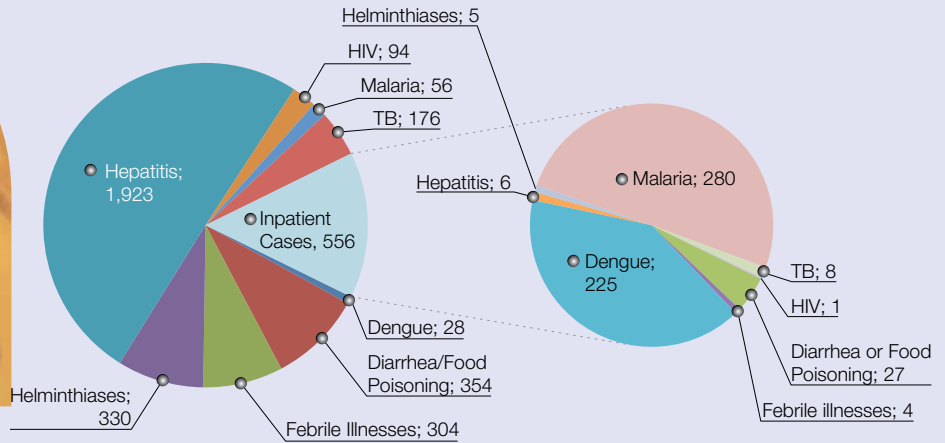
"My proudest accomplishment as a Deputy Dean is having restructured the Faculty administration to establish the Office of International Cooperation, which facilitates the numerous collaborative relationships we have. Our partners are from all over the world and some of our collaborations have lasted for 30 years. We constantly work to keep our existing collaborations active, and I hope that in the future we will expand our collaborative network even further into Southeast Asia."



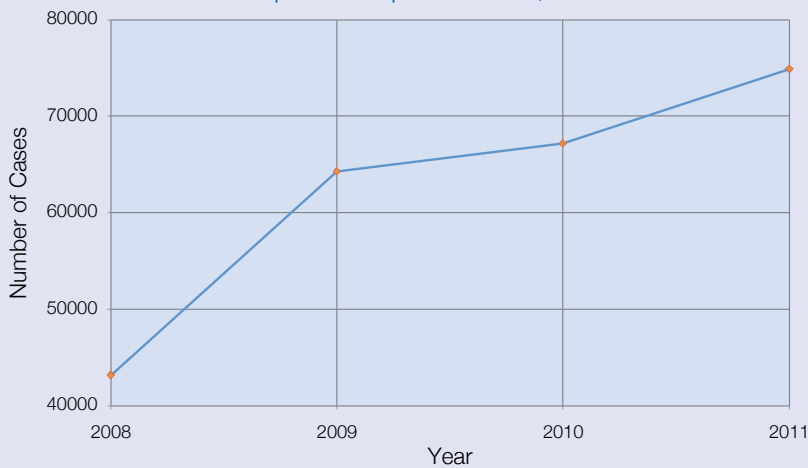
Map showing locations of the 11 institutes with which FTM has MoUs.

Asst. Prof. Udomsak Silachamroon

Director of Hospital for Tropical Diseases



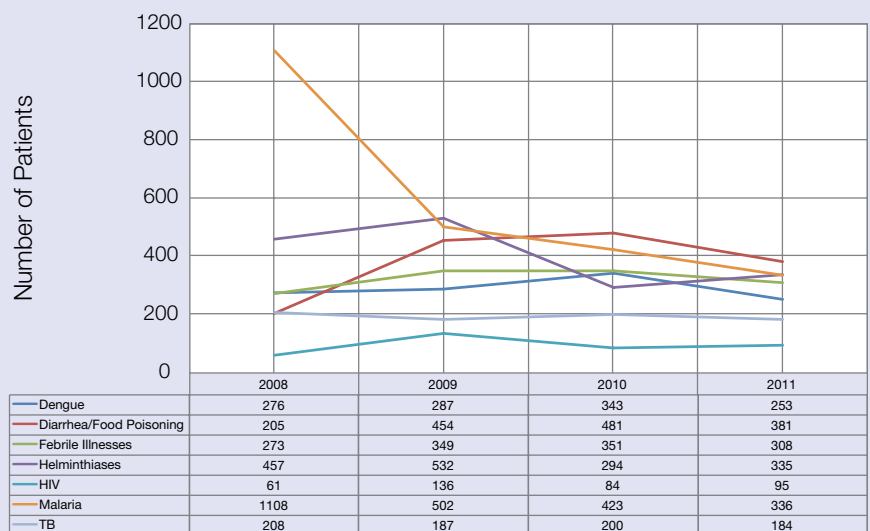
Total number of cases, both inpatient and outpatient, at the Hospital for Tropical Diseases, 2008-2011



Throughout its 50 years, the Hospital for Tropical Diseases has continually developed. It is now recognized as a highly reputable, specialized expert facility for treating patients with tropical diseases from all around the world. In 2011, we established a new fever clinic, we accomplished Step 1 of the National Hospital Accreditation program, we improved upon our malaria diagnostic services and travel clinic, and we set up a Special Mobile Medical Team to assist victims during the flooding crisis."

The above graph shows the breakdown of patients with infectious diseases admitted to the Hospital in 2011. The left graph shows all cases, outpatient and inpatient, while the right shows inpatient cases in more detail. There was a total of 3265 outpatient cases and 556 inpatient cases with infectious diseases. There were also 69,936 outpatient cases and 1,150 inpatient cases with non-infectious diseases.

Number of tropical-disease cases at the Hospital for Tropical Diseases, 2008-2011



Infrastructure



Mr. Chanathep Pojjaroen-anant

Deputy Dean for Physical System and Campus



“By far my biggest project is overseeing the construction of the new Center of Excellence, which will eventually house the Hospital for Tropical Diseases. In 2012, I will begin to oversee the transfer of resources, equipment and supplies from the old building to the new Center, to ensure a smooth transition.”

Personnel and Policy

Asst. Prof. Kasinee Buchachart

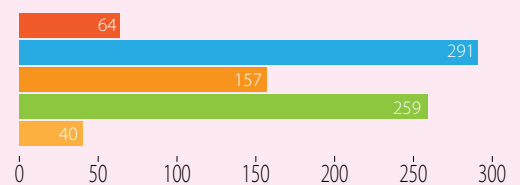
Deputy Dean for Strategy and Faculty Secretary



“We are currently developing and revising the Major Policy Plan of the Faculty. It involves all the Heads of Department and the Faculty Board, and requires a review of many things, including setting up and evaluating competencies, looking at key performance indicators, and performance agreements. We review our plans and have workshops and seminars to develop ideas about how to apply these new plans. We are also attempting to establish an IT network that links every office together for optimal efficiency. It will be a real challenge to implement, but one I’m looking forward to completing.”

Faculty of Tropical Medicine Personnel, 2011

Position	Number of staff members in 2011
Officials	64
University Staff	291
Division Staff	157
Full-time Employees	259
Casual Workers	40
Total	811
*** A total of 31 people retired in 2011	
Academic Staff	
PhD	98
Master Degree	10
Total	108



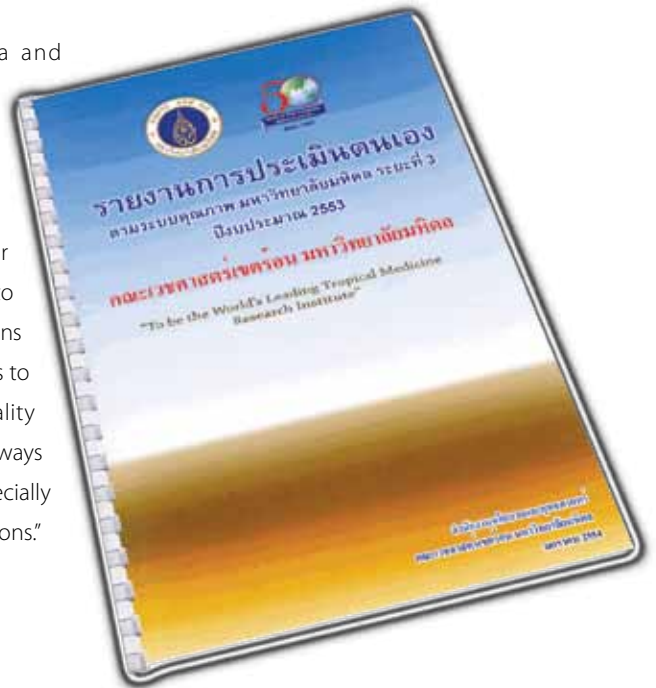
Quality Development

Dr. Saranya Kaewprasert

Deputy Dean for Quality Development and Special Activities



“We collect the data and provide support documents and materials to make reports to external committees. During 2011, we received a research grant for supporting staff of the Faculty to develop the Routine to Innovations project. The main objective was to develop human resource quality and supporting our staff to find ways to improve their routines, especially time, cost, and resource reductions.”



Welfare & Culture

Assoc. Prof. Wichit Rojekittikhun

Deputy Dean for Staff Welfare and Culture



“In 2011, I organized sporting events and provided memberships to sports facilities for staff for activities like takraw, football, and karaoke clubs. Our Faculty regularly participates in sporting leagues between different Universities. During the flooding crisis, my team allocated 1 million baht to help those staff whose homes were affected. I am happy to do whatever I can to benefit the welfare of the staff.”

*“To be the World’s Leading
Tropical Medicine Research Institute”*

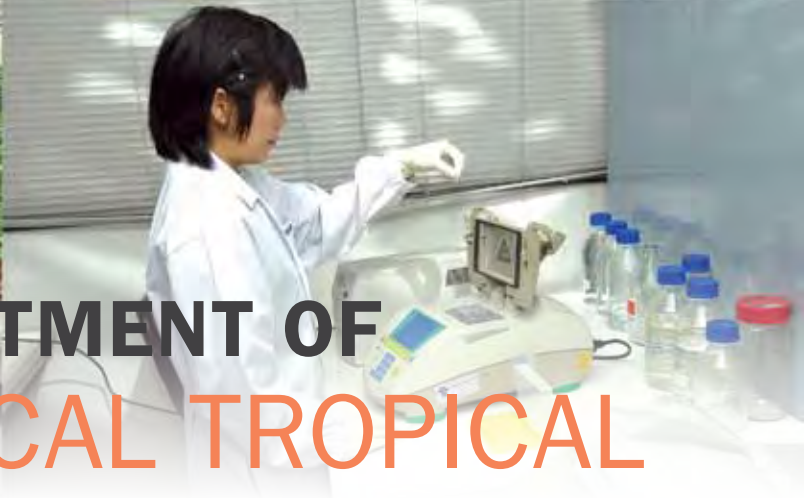
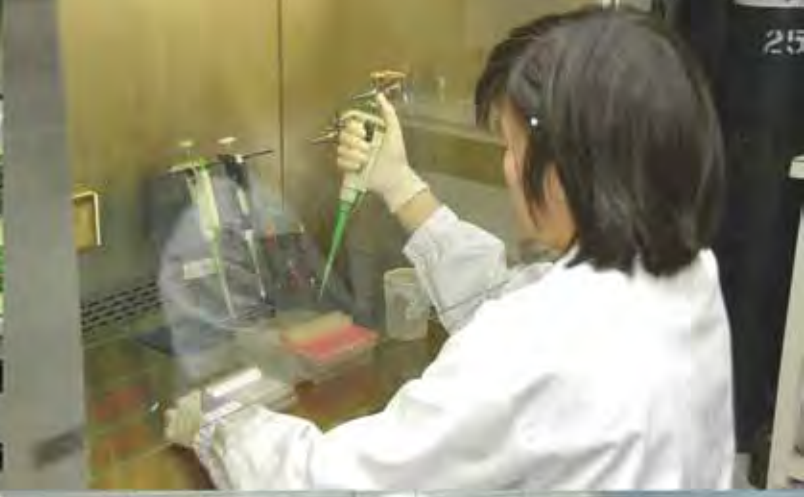


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DEPARTMENT OF CLINICAL TROPICAL MEDICINE

HIGHLIGHTS



- AIDS vaccine – results of phase 3 vaccine trials show there is a possibility of immune correlates of protection in the RV144 vaccine trial which may lead to the next generation of AIDS vaccine
- AIDS Vaccine Conference 2011
- Malaria – the Department has conducted clinical trials using various combinations against drug resistance in malaria
- Flu vaccine – Government Pharmaceutical Organization (GPO) live-attenuated H1N1 influenza vaccine; the Department contributed by conducting phase 1 & phase 2 studies, which have led to licensure of this vaccine for pandemic use in Thailand
- Started dengue vaccine trial – phase 3 efficacy trial, involving children aged 2-14 years in Khamphaeng Phet Province, Thailand
- Quadrivalent and nanovalent HPV vaccine for cervical cancer – phase 3 efficacy trial as part of a multi-centered study in young women and bridging study in children
- Development of a new technique to identify malaria-parasite resistance to artemisinin derivatives

AIDS & DENGUE VACCINES

Prof. Punnee Pitisuttithum, Head of the Department, leads the clinical team in the RV144 vaccine trial, increasing our knowledge of immune correlates which she hopes will contribute to the next generation of vaccines. Her main interests are infectious-disease vaccines and drug development. She has been involved in cholera, malaria, and rotavirus vaccines, since 1986. She is also the Principal Investigator in the RV306 vaccine trial. This study looks at immune correlates of protection, has recently added 2 more booster doses, and will start in 2012 in healthy participants.

Prof. Punnee is also the Principal Investigator for conducting a phase 3 efficacy trial of a new Dengue vaccine at a study site in Khamphaeng Phet Province. The Department has been working towards developing a Dengue vaccine using chimeric virus technologies, and based on promising results from immunogenicity testing in mice, the chimeric viruses are considered to have good potential to be developed further as vaccine candidates.

"Hopefully from successful phase 3 trials, if it can prove to be efficacious, then the vaccine will be licensed for use," states Prof. Punnee.

INFLUENZA VACCINE

The department has also been busy working on an influenza vaccine to use in Thailand.

"We have conducted phase 1 and 2 studies of a live attenuated flu vaccine, produced locally by the Government Pharmaceutical Organization (GPO). It is already licensed for pandemic use, and is an import tool for lessening the pandemic situation. Under the leadership of the Ministry of Public Health and funded by the WHO, hopefully in the near future we will start a phase 1 study of this vaccine.

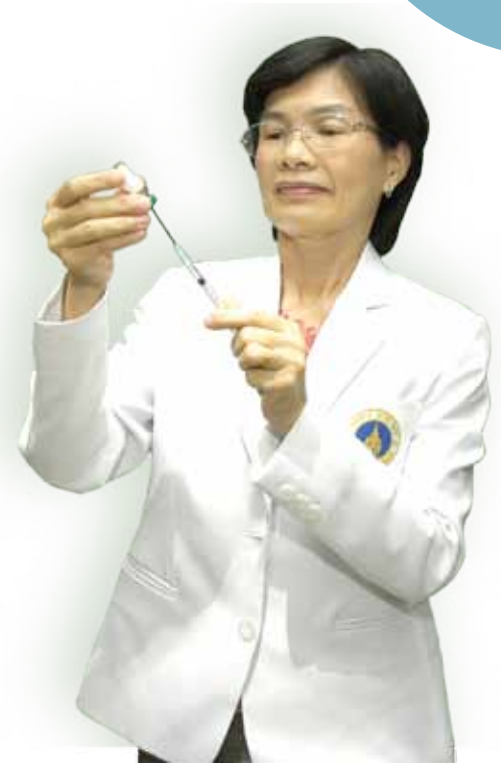
"I like to work with vaccines and stop healthy people from becoming sick. Working with these types of vaccines, you can protect millions from disease. It's like helping the masses from illness," concludes Prof. Punnee.

FORWARD TO 2012

Moving into the new year, Prof. Punnee explained the Department's work in drug development. "We will continue our work leading to new guidelines in the treatment of infectious diseases. For malaria, we can study various combinations of drugs in the hope that it can lead to a new regiment or new treatments for drug resistant malaria. A drug trial leading to a changing of the guidelines for the treatment of melioidosis is also planned."

CLINICAL RESEARCH ON MELIOIDOSIS

Dr. Wirongrong Chierakul leads the Department's research on melioidosis. "Melioidosis often occurs in the same area as leptospirosis and scrub typhus," says Dr. Wirongrong. "But melioidosis is much more difficult to treat." Having started studying melioidosis in 1997, her research tries to improve the clinical outcomes of patients with the disease directly. "Thailand is the capital of melioidosis research," she explains. "Especially in the Northeast region, where the incidence of melioidosis is the highest in the world. That is how I became interested in this disease. Once, when I traveled to the Northeast, I saw firsthand the large number of patients and the burden the disease placed on them. I've been studying melioidosis ever since."



"I like to work with vaccines and stop healthy people from becoming sick. Working with these types of vaccines, you can protect millions from disease. It's like helping the masses from illness."



"Thailand is the capital of melioidosis research, especially in the Northeast region, where the incidence of melioidosis is the highest in the world."



“We want our research to shape new public health policies and if necessary, make arrangements to prevent the spread of resistance.”

“If we are successful with the methodologies and techniques we are establishing, we would like to inform and share our knowledge with other researchers, enabling them to benefit our patients.”

In 2011, Dr. Wirongrong and her team, collaborating with the Mahidol-Oxford Research Unit (MORU), completed a clinical trial testing the efficacy of a new treatment regimen for melioidosis. The trial was carried out in “early-catch” phase and acute phase patients, with a goal of minimizing the treatment regimen, hopefully to increase patient compliance. “Patient compliance is very important and hard to control,” explains Dr. Wirongrong. “The current recommended treatment is 5 months long and many patients do not understand why they need to continue taking medication after their symptoms go away. When they do not finish the regimen, infections can recur.”

After her team identify a standardized and efficient treatment for melioidosis, Dr. Wirongrong is well-placed to disseminate any findings. She has a history of working closely with melioidosis researchers all over the world, as well as with local researchers and policymakers in Thailand at the Ministry of Public Health, Khon Kaen University, and several local hospitals in the Northeast. Additionally, she is leading the organizing committee for the World Melioidosis Congress 2013, which will be held in Thailand.

CLINICAL TRIALS TO INVESTIGATE ARTESUNATE RESISTANCE

Like many other Departments at the Faculty, researchers of the Department of Clinical Tropical Medicine are investigating the emerging resistance against artemisinin in malaria. Clinical trials which concluded in 2011 show evidence of a decreasing efficacy of artesunate, which is part of the artemisinin group of antimalarial drugs. “Our duty as the Faculty of Tropical Medicine and researchers in this region is to first confirm the resistance, and then see if it is spreading to Thailand and to other parts of the world,” says **Prof. Sasithon Pukrittayakamee**. “We want our research to shape new public health policies, and if necessary, make arrangements to prevent the spread of resistance.”

NEW METHODOLOGIES IN MALARIA RESEARCH

Dr. Kesinee Chotivanich has been working on two main areas of research: the pathophysiology and pathology of malaria infections, and anti-malarial resistance among malaria patients, especially in Thailand.

Describing her work on these projects, Dr. Kesinee said, “We need to study methods and techniques that can identify parasites that are resistant to the drugs we are using to combat malarial infections. If doctors know that the parasite is resistant to a particular drug, they can choose an alternative drug to treat the patient.”

“By developing new research and management techniques, and updating our knowledge in malaria treatment, we can then hope to use this in helping and benefiting our patients.”

Focusing on her lab’s success last year, Dr. Kesinee went on, “One of the main achievements from last year was the development of a new



technique to identify parasite resistance to artemisinin derivatives, the drugs we use to treat malaria infection. After we identify the parasites, we screen and test, and then look at new drugs and compounds that might be used as candidates for use in treating patients with multidrug-resistant parasites." This work is supported by the Office of the Higher Education Commission, Mahidol University under the National Research Universities Initiative, and the Mahidol-Oxford Tropical Medicine Research, Unit.

"If we are successful with the methodologies and techniques we are establishing, we would like to inform and share our knowledge with other researchers, enabling them to benefit. Then, in the future, our combined knowledge can be used to establish new standards and procedures for malaria diagnosis, as well as susceptibility testing for anti-malarial drugs. We can apply all of this in the field of malaria research with the overall outcomes leading to better management and treatment for our patients."

TRAVEL MEDICINE RESEARCH UNIT

Dr. Watcharapong Piyaphanee is Chief of the Travel Medicine Research Unit within the Department of Clinical Tropical Medicine. He describes his work as a clinician and the research he is involved in: "My job sees me working as a clinician in the Hospital and also giving lectures for the Department. As a clinician, I see patients in the Outpatient Department of the Hospital, the special Travel Clinic, attend to patients in ICU, and I also have to be on call outside office hours. I also give lectures on our regular courses (DTM&H, MCTM, MSc., PhD) and other special courses in the Faculty."

"My research is in travel medicine and travel-related diseases. I deal with travel-related diseases that differ according to which region of the world the traveler has been in or is going, e.g. in Southeast Asia, a person might get dengue or malaria, whereas in European countries the diseases will be different. Travelers consult me before they travel to see which medications or vaccines they might need. Others come to see me after their trips for diagnosis and treatment of travel-related diseases. About half of the people coming to the travel clinic are foreigners.

"My current research activities include looking at health risks among travelers in Southeast Asia. We have just completed data collection of two big surveys at Suvarnabhumi Airport. The results from this study are going to be published soon. Moreover, this year we will also see the completion of a study looking at disease among Thai travelers in the Thai-Lao border areas. We are investigating a spectrum of diseases, funded by the Faculty and also in collaboration with the Ministry of Public Health. We're also collaborating with the Royal Thai Navy and the MOPH, looking at the safety and efficacy of *Ipomea caprae* ointment in the treatment of jellyfish dermatitis. We have 5 sites in the south, in the Gulf of Thailand and the Andaman Sea. It has been difficult, however, recruiting participants; we have many sites, but few people are getting stung and visiting our study site. We need 100 participants but only have 12 so far. We will continue and hope to progress with this study."



"Travelers consult me before they travel to see which medications or vaccines they might need. Others come to see me after their trips for diagnosis and treatment of travel-related diseases."



DEPARTMENT OF HELMINTHOLOGY



HIGHLIGHTS



- The Department of Helminthology, led by Head, Dr. Chalit Komalamisra, has studied and provided diagnostic services for helminthiasis for decades.
- The Department conducted a population genetics study on the liver fluke, *Opisthorchis viverrini*, in the Mekong River Basin, revealing its extremely low genetic variation. In contrast, the minute intestinal fluke, *Haplorchis taichui*, showed high variation specific to each region.
- Furthermore, the Department works to develop a multiplex PCR-based method to detect and quantify trematode infections in fish to be applied to co-infections with multiple parasites.
- Immunological studies done by the Department in 2011 included exploring the therapeutic potential of helminthes for autoimmune diseases, and identifying molecules for drug design in the treatment of cholangiocarcinoma.
- Within the Department, the Immunodiagnosis Unit for Helminthic Infections provides serological testing for such helminthic infections as angiostrongyliasis, gnathostomiasis, and cysticercosis.



“The Department of Helminthology carries out research in 5 main areas: biology, ecology and diversity, taxonomy and population genetics, epidemiology and community health, immunodiagnosis, and molecular helminthology”

The Department of Helminthology, led by Head **Dr. Chalit Komalamisra**, carries out research activities in the basic and applied sciences in 5 main areas--biology, ecology and diversity, taxonomy and population genetics, epidemiology and community health, immunodiagnosis, and molecular helminthology. In 2011, the Department had 8 PhD students and 3 MSc students.

Numerous researchers in the Department have several years' experience in helminthology, dating back to a time when helminthiases were even more prevalent in the Bangkok Metropolitan Area. **Dr. Jitra Waikagul** has been studying helminthes in Thailand since she was a Master's student at the Faculty, in 1973. The Department has consistently worked to treat patients with helminthiases and increase public awareness of the risks that cause helminthic infections. Over the years, she has personally witnessed the success of the Faculty as the prevalence of helminthiases in urban areas has decreased and receded further into the countryside. "Treatment has become more available in Bangkok and modern development has increased hygiene," says Dr. Jitra. "TropMed students also travel to field sites twice a year to diagnose and treat infections. However, every year we travel farther and farther from Bangkok to find and treat patients, since the prevalence is decreasing. Although helminthiases remain a problem, our work can be seen as a success story for TropMed. The efforts of our Department have directly brought about real change, with significant improvements to public health."

POPULATION GENETICS OF HELMINTHES IN THE MEKONG RIVER BASIN

2011 saw the close of one major project of the Department: a 3-year TRF-funded investigation of the population genetics of *O. viverrini* and *H. taichui*. **Dr. Jitra Waikagul** and **Dr. Urusa Thaenkham** collaborated on an investigation of helminth populations in the Mekong River Basin, a report on areas with a high prevalence of helminth infections among fish populations, and continued studies of the genetic diversity of parasitic worms.



“The efforts of our Department have directly brought about real change, with significant improvements to public health.”



“Clinical data seem to indicate that helminthiases are more prevalent before the rainy season in Thailand. If this is indeed the case, I plan to prove it.”



“Following a trend in the US, the effects helminthes have while living in a human host can suppress the immune response that causes inflammation. If proven effective, this method could revolutionize the therapy options for inflammatory and autoimmune diseases.”

Before this study, previous evidence suggested that *O. viverrini* was a species complex with high genetic diversity. However, the Department’s findings were not consistent with this. “Using mitochondrial DNA, we found that *O. viverrini* was genetically almost identical everywhere,” says Dr. Jitra. “But, we did find an additional species of *Opisthorchis* in Lao PDR, which had only previously been recorded in Pakistan: *O. lobatus*.”

Although *O. viverrini* was shown to be relatively homologous, *Haplorchis taichui* was shown to possess high degrees of genetic variation specific to each region.

From a systematics point of view, findings from these genetic studies have been used to analyze the accepted family structure of these helminthes. It was previously thought that Opisthorchiidae (of which *O. viverrini* is a member) and Heterophyidae (of which *H. taichui* is a member) were distinct families, but Dr. Urusa is seeing increasing evidence that this is not so. “The original classification system divided the two families based on morphology. But molecular evidence suggests we cannot separate these two families, that instead they are paraphyletic.” [composed of some, but not all members descending from a common ancestor].

USING MULTIPLEX PCR TO DETECT AND QUANTIFY METACERCARIAE INFECTION IN FISH

Dr. Urusa’s main project in 2011 was to develop a multiplex PCR method to detect trematode infection in fish. By investigating fish populations in some provinces of the Central region of Thailand, she hopes to identify each parasitic species infecting individual fish and quantify the number of worms. “In these areas, *O. viverrini* and *H. taichui* often occur in co-infections,” says Dr. Urusa. “Quantification is necessary to assess the risk to human populations.”

Although this project is only in its nascent stages, once an effective and sensitive method is developed, Dr. Urusa plans to work with Dr. Jitra and apply it to study seasonal variations in the prevalence of helminthes among fish populations. “Clinical data seems to indicate that helminthiases are more prevalent before the rainy season in Thailand,” explains Dr. Urusa. “If this is indeed the case, I plan to prove it.”

Developing diagnostic techniques remains an important hurdle in helminthological research. Current diagnostic methods rely on the morphological identification of eggs. However, the eggs of many species of helminthes are very similar morphologically, resulting in frequent misdiagnosis and oversight of a co-infecting agent. In addition, as more evidence of *O. viverrini*’s association with cholangiocarcinoma surfaces, accurate diagnosis is becoming crucial.

USING HELMINTHES TO TREAT AUTOINFLAMMATORY DISEASES

A newer researcher to the Department, **Dr. Poom Adisakwattana**, is taking a different approach to studying helminthiases. Particularly innovative is his study of the therapeutic potential of helminthes for treating inflammatory and autoimmune diseases, such as inflammatory bowel disease. Following a trend in the US, the effects helminthes have while living in a human host can suppress the immune response that causes inflammation. “When living in hosts, helminthes inhibit the expression of the group of cytokines that result in the painful symptoms of these diseases,” explains Dr. Poom. Currently, he is exploring the therapeutic potential of species of *Trichinella* and *Schistosoma*.

If proven effective, this method could revolutionize the therapy options for inflammatory and autoimmune diseases. “Currently, most of these diseases are treated with steroids, which have several adverse effects,” says Dr. Poom. “We want to improve the quality of life of patients with these diseases. We can also learn more about host-parasite interactions by conducting this type of study.”

OTHER IMMUNOLOGICAL STUDIES OF HELMINTHIASES

In addition to this study, Dr. Poom also received a TRF New Researcher grant to identify potential surface molecules in cholangiocarcinoma that can be targeted for drug design. Preliminary *in-vitro* studies have already identified one cytokine that enhances tumor development and migration in cell cultures. “The nature of cholangiocarcinoma is such that it is often not diagnosed until it is already in the final stage,” explains Dr. Poom. “It does not respond to current cancer treatments, so we hope that by identifying these target molecules we can improve prognoses for patients.”

Dr. Paron Dekumyoy also conducts immunological research, but on a different helminth—*Angiostrongylus cantonensis*--which can cause eosinophilic meningitis. Patients become infected with *Angiostrongylus* through the ingestion of raw or undercooked snails, contaminated vegetables, or contaminated water. Worms migrate into the CNS, where the larvae do not reproduce, but when they die, they cause an eosinophilic inflammatory reaction. However, humans are not the target host for *Angiostrongylus*, so it is more like an accidental infection.

Dr. Paron is currently perfecting methods for the immunodiagnosis of angiostrongyliasis. “Many parasites can be diagnosed by conventional methods, such as stool samples, because these parasites reproduce in the human host and produce eggs that are then expelled in feces,” says Dr. Chalit. “However, the parasites we study don’t reach maturity in a human host, so they don’t produce eggs. Therefore, there’s no way to look for infection using conventional methods.” And, since angiostrongyliasis infections can have such lethal effects on the human host, proper and efficient diagnosis is crucial.

DIAGNOSTIC SERVICES

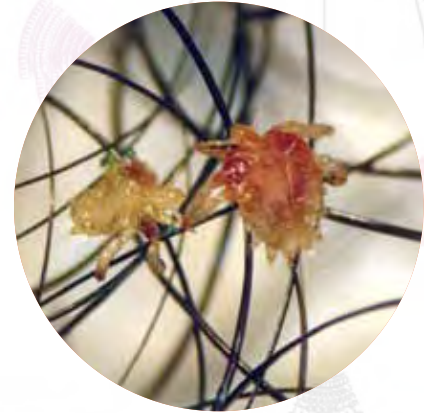
The **Immunodiagnosis Unit for Helminthic Infections**, which has been running since 1987, conducts serological testing for helminthic infections. Through the Unit, the Department has diagnosed thousands of serum samples from all over the world and is proud to be one of the few sites recommended by the CDC for the serodiagnosis of helminthic infections, particularly angiostrongyliasis, gnathostomiasis, and cysticercosis. In 2011, the Department analyzed 1,565 such samples that were sent from hospitals all over the world. “We also provide sample kits to outside institutes and researchers, for identifying parasite infections, stool-examination services for diagnosis, and stool sample kits,” notes Dr. Chalit.

“We also provide sample kits, to outside institutes and researchers, for identifying parasite infections, stool-examination services for diagnosis, and stool sample kits.”





DEPARTMENT OF MEDICAL ENTOMOLOGY



HIGHLIGHTS

- The Department of Medical Entomology contains experts in vector-parasite relationships, and conducts vector population surveys and investigations into the effects of climate change on vector species. The Department also conducted quick-response outbreak-control projects during the 2011 flood crisis.
- Head of Department, Dr. Chamnarn Apiwathnasorn, led efforts to monitor the breeding habitats of the malaria vector, *An. dirus*, and populations of leishmaniasis vectors (sandflies).
- Research investigating the transovarial transmission of the dengue virus in *Ae. aegypti* larvae showed promise for the basis of an early warning system for dengue outbreaks.
- Using molecular techniques to sequence cytochrome oxidase subunit I in insects, researchers of the Department are contributing to a DNA barcode database of medically important insects in Thailand.
- Climate change was a major theme of departmental research, including a study that illustrated insecticide efficacy to be negatively correlated with temperature.
- In addition to the Department's Mosquito Museum, which provides vector specimens for educational and research purposes, the Department also offers services identifying insect species, and testing the efficacy of insecticides or repellents, for institutes in Thailand and abroad.



The **Department of Medical Entomology**, headed by **Dr. Chamnarn Apiwathnasorn**, is responsible for research on vector-parasite relationships, including surveys of mosquito breeding sites, research on insects that inhabit caves, population genetics, vector status, molecular studies, and the relationship between climate change and vectors. Other basic science studies involve extracting oils from herbs and testing their usefulness as insect repellents.

In addition to regular research, the Department was also involved in the Faculty's response to the 2011 flood crisis and subsequent attempts to control mosquito populations. To prevent vector-borne disease outbreaks, the Department collaborated with the Faculty of Science, Mahidol University, to explore the potential use of *Bacillus sphaericus* to kill mosquito larvae. There was also a separate collaboration with a team from the Japanese NGO Nippon International Cooperation for Community Development (NICCO), who coordinated insecticide sprays in outbreak-risk areas of Bangkok and Ayutthaya. After spraying, the Department monitored the mosquito populations and made recommendations for how to proceed.

MONITORING VECTOR POPULATION DYNAMICS AND BREEDING SITES

Dr. Chamnarn and his team monitor two populations of medically important vector species. He recently discovered alternative breeding places for *Anopheles dirus*, the main malaria vector in Thailand. "This is important, because *An. dirus* usually inhabits deep forests," explains Dr. Chamnarn. "In 2011, we discovered them breeding in rock pools in more open areas in Kanchanaburi, and in caves. Both of these are more extreme habitats and we hypothesize that this may be due to temperature or environmental changes. The mosquito may need more humid or secure places to breed." Their breeding locations are significant because if *An. dirus* changes its behaviors, perhaps by feeding on bats or reptiles in the caves, this could have an impact on their life cycle or change the malaria-transmission cycle. "Recently, there have been fewer malaria infections in Thailand," says Dr. Chamnarn. "However, changes occurring in vector species and their breeding sites may cause re-emergence of this disease."

Other than *An. dirus*, Dr. Chamnarn and his team also surveyed sandflies in Thailand, which is the vector species for leishmaniasis. Although leishmaniasis is not endemic to Thailand, recent years have seen a few instances of autochthonous cases, indicating it may emerge in Thailand. "Currently, we have yet to find a link or complete the transmission cycle because we cannot find the species of sandfly that bites humans," says Dr. Chamnarn. "Despite the fact that in previous years we found several of these species in Thailand, most encountered nowadays bite reptiles or other cold-blooded animals." While this is good news, the Department plans to pursue further studies to understand why sandflies no longer bite humans in Thailand, which is necessary to determine if there is a risk of the emergence of leishmaniasis.



"We recently discovered alternative breeding places for Anopheles dirus which is important because if An. dirus changes its behaviors, perhaps by feeding on bats or reptiles in the caves, this could have an impact on their life cycle or change the malaria-transmission cycle."



USING MOSQUITO LARVAE TO SURVEY TRANSOVARIAL DENGUE INFECTION

Research led by **Dr. Supatra Thongrunkiat** involves studying interactions between the dengue virus and its mosquito vector, *Aedes aegypti*. In the Bang Khun Thian District of Bangkok, Dr. Supatra and her team identified people diagnosed with dengue infections and visited their homes and neighborhoods monthly. Once there, she collected *A. aegypti* larvae and tested them for infection with the dengue virus. “Only female *A. aegypti* will bite humans and start a new cycle of dengue infection,” explains Dr. Supatra. “However, by looking at the prevalence among mosquito larvae, we are studying the transovarial infection rate, that is, the transmission of the virus from mother to offspring.”

After conducting these surveys once a month, Dr. Supatra found something very interesting. After matching their results with data from local hospitals about the number of dengue cases, her team discovered that a peak in dengue prevalence in the larvae was soon followed by a sharp increase in the number of human cases of dengue infection. This indicates the potential application of her study methods. “Currently, there is no parameter that can serve as an early warning for a dengue outbreak,” says Dr. Supatra. “However, this type of surveillance of mosquito-larvae populations can be used to monitor endemic areas, and identify where and when disease-control measures are needed.”

Dr. Supatra took her investigation of transovarial transmission of dengue one step further after obtaining a Dean’s Research Fund grant in late 2011, to study the effects of different temperature gradients on the rate of transmission. “Maintaining cultures at 24°C, 32°C, and 34°C, I am seeing how dengue transmission is affected by different temperatures,” explains Dr. Supatra. “In a way, findings from this study can be used to predict how climate change may affect this in the future.”

“Currently, there is no parameter that can serve as an early warning for a dengue outbreak; however, this type of surveillance of mosquito-larvae populations can be used to monitor endemic areas, and identify where and when disease-control measures are needed.”



INSECTICIDES AND CLIMATE CHANGE

Continuing with the theme of climate change, **Dr. Narumon Komalamisra** studies the effects of temperature on mosquito susceptibility to pyrethroid-based insecticides. In Thailand, insecticide-based strategies to control vector-borne diseases have proven difficult to carry out. “In some areas, insecticides are used improperly,” remarks Dr. Narumon. “Sometimes they are fake or diluted sprays. Sometimes the measures taken are unnecessary. All of this just increases the chance of insecticide resistance developing.”

Additionally, there is already evidence that higher temperatures due to climate change are shortening the life cycle of different species of mosquitos, which leads to a faster development of new generations and may also lead to an increased transmission of the dengue virus or other vector-borne diseases. “Obviously, climate change is a major concern today,” says Dr. Narumon. “I believe that the insecticides possess properties that cause them to have reduced effectiveness at higher temperatures. I want to confirm that, so we can change how we control vector-borne disease outbreaks.”

But if insecticides are proven less effective at higher temperatures, it is not as simple as just increasing the concentration of insecticide in the spray. “That would be very dangerous,” explains Dr. Narumon. “If insecticides cannot be used, we must increase personal-protective methods, such as using skin repellents, mosquito nets, and mosquito coils.”

“Obviously, climate change is a major concern today. I believe that insecticides possess properties that cause them to have reduced effectiveness at higher temperatures. I want to confirm that, so we can change how we control vector-borne disease outbreaks.”



CREATING A DATABASE FOR DISEASE VECTORS IN THAILAND USING DNA BARCODES

While most researchers in the Department are classical taxonomists, who identify species of insects morphologically, **Dr. Jiraporn Ruangsittichai** is exploring the use of molecular methods. The “DNA Barcode” project uses the DNA sequences for cytochrome oxidase subunit I, to identify individual species. This is particularly useful when several species are morphologically similar, or are distributed in different breeding sites. “The outcome will be to establish a DNA barcode reference database about insect vectors in Thailand,” says Dr. Jiraporn. “The database will be open to public users, who can then use the DNA barcode as a reference to detect previously unidentified insect species.”

Collaborating with the Biodiversity Institute of Ontario, Dr. Jiraporn and her team collected and sequenced multiple DNA samples for identifying different insect species, especially disease vectors, such as mosquitoes, cockroaches, and ectoparasitic insects. “The use of DNA barcodes is one of the most definitive methods of identifying species”, explains Dr. Jiraporn. “It has important implications for studying the epidemiology of vector-borne diseases, disease transmission, and vector capacity.”

EDUCATION AND SERVICES

There are currently 13 students, 7 doctoral & 6 Master of Science in Tropical Medicine, studying with the Department. Most PhD students are involved in researching various select species, to produce DNA barcodes for these species. Other research opportunities include vector competency and vector-borne transmission studies.

The Department also provides academic and laboratory services to other institutes, hospitals, researchers and public-health workers, including identifying medically important insects or arthropods, providing mosquito specimens for teaching and research through the Department’s **Mosquito Museum**, and testing the efficacy of various insect repellents or insecticides. In that last role, the Department has tested repellents and insecticides from institutes in Thailand and France.



DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

HIGHLIGHTS

- *Aeromonas* bacteria - working towards producing 7 independent monoclonal antibodies (mAbs) to each – currently have 3 mAbs, which can be used as a diagnostic tool to screen for *Aeromonas*
- Molecular typing of *Legionella pneumophila*, a Gram-negative bacterium
- Brucellosis disease - identification of *Brucella*, based on genome sequencing to identify bacterial strain
- Surveillance of the genome evolution of seasonal influenza virus H1N1 and novel influenza A H1N1 in flu seasons in Bangkok (2011-2012)
- Production of neutralizing human mAbs in Thai HIV infected individuals, using hybridoma and phage display techniques, against HIV-1 viruses
- Identifying mechanisms of antimicrobial resistance to antibiotics (ceftazidime) in the *Burkholderia* bacteria
- Early-stage investigator feature: Dr. Pornpan Pumirat

“I have been studying 7 species of bacteria and working towards producing 7 independent monoclonal antibodies (mAbs) to each of the 7 species.”



Dr. Yuvadee Mahakunkijchaoen, who has only been Head of the Department for 4 months, explains the interests of researchers in the Department of Microbiology and Immunology. "Interests in our department are based on three fields, our staff work under the umbrella of microbiology, immunology, and molecular biology." "The main organisms of interest used as models include: pathogenic viruses, bacteria, leptospirosis, *Brucella*, *Listeria* and *Burkholderia*." "I feel the researcher should be able to continue in their field of interest; my duty is to support and facilitate their work."

Dr. Yuvadee has not always worked with bacteria, "My previous expertise was in the study of malaria and schistosomes, but since joining the department I have been working with different species of *Aeromonas* bacteria (water-borne bacteria found as environmental and food contaminants). I have been studying 7 species of bacteria and working towards producing 7 independent monoclonal antibodies (mAbs) to each of the 7 species. I studied the toxins produced by the organism. My first aim is to develop a technique to identify the bacteria to species level. Most of the labs in Thailand can identify these bacteria into only

3 species. We currently have 3 mAbs that we can use as a diagnostic tool to screen for *Aeromonas* in samples."

RESEARCH TO AID THE ECONOMY

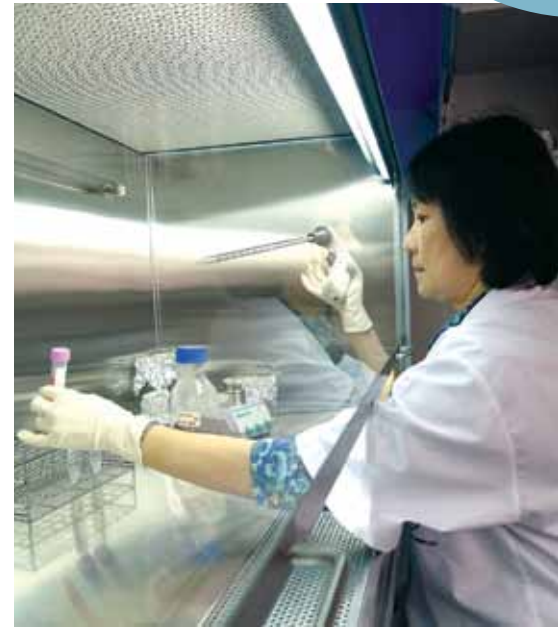
The last year saw the continuation of two projects by Deputy Head, **Dr. Thareerat Kalambaheti**. "I began working on a new project; molecular typing of *Brucella*, and was also continuing work on the molecular typing of *Legionella pneumophila*".

"Working on *Brucella* was the Dean's idea; he wanted a member of the faculty to work on this topic as it is relevant right now," states Dr. Kalambaheti.

This disease is an economic problem for Thailand; recently, 1000 sheep in Kanchanaburi Province died as a result of brucellosis. Sheep and cows are lost through abortions caused by the disease.

Now, with the information gained from our studies in the laboratory, it has been possible to begin to identify specific species isolates from a few provinces in central Thailand, so I'm very enthusiastic to be involved in these studies this year. If we can identify which isolates we have in the laboratory, we will be able to establish a system or database of different isolates. We can then provide this as a unique service in Thailand. So we hope to be the first to establish this. I hope to develop a system whereas we will be the first lab in Thailand to culture, at species level, individual *Brucella* species.

Dr. Thareerat continued, "We wish to establish different strains of the disease in the laboratory, in order to track the origin of disease. If we can track the origin we can establish how the disease is spread."



"The researchers should be able to continue in their work of interest. My duty is to support and facilitate their work."



"Brucellosis is an economic problem for Thailand; recently, 1000 sheep in Kanchanaburi Province died as a result of brucellosis. Sheep and cows are lost through abortions caused by the disease."



KNOWLEDGE IS KEY

Prof. Srisin Khusmith explains why she continues to be involved in the study of malaria, after more than 30 years. "I think that we should be compelled to do research on our own specific problems which affect us nationally. I am interested in malaria because I think of it as *'our disease - our problem.'* Parasitic diseases are an area of overall importance, I believe."

"I think that if we are talking about impact, most people try to think commercially, but for me, I think equally important is basic knowledge. If we don't have a basic knowledge, it's very difficult to build up or strengthen research capacity, not only in our faculty, but in Thailand."

"The faculty tries to use all their expertise in tropical medicine, to conduct research with a multi-disciplinary approach, in order to gain further knowledge."

"If we don't have the basic knowledge, it's very difficult to build up or strengthen research capacity, not only in our faculty, but in Thailand."

MANAGEMENT TRAINING

Since 1996, the Department has the distinction of being a World Health Organization Collaborating Center (WHO CC) for the Clinical Management of Malaria. This involves training in the management of malaria, which is organized by the faculty. They also organize special courses requested by outside institutes looking for training in malaria management. This training may be as combined lectures/seminars, presentations, or clinical workshops, to observe patient care. Participants come from many countries and the training is evaluated by the WHO every 4 years. The Department will also set up a training center to focus on 'the hot issues' that are relevant, and for training in new technologies used by staff.



INFLUENZA, HIV AND THAI MEDICINAL PLANTS

Dr. Pornsawan Leungwutiwong, and her students from the Virology Unit, has been working on many projects during 2011. Here she explains her interest in influenza, and other projects undertaken during the past year.

"Influenza viruses are unpredictable; they have the potential to change and become more transmittable among humans, as shown by the emergence of the influenza H1N1 pandemic in 2009. I think influenza viruses are so interesting and terrifying at the same time."

"Our work on HIV would be the first for producing neutralizing human monoclonal antibodies (Nh-mAbs) to the HIV-1 strains established in Thailand. The knowledge gained from this study may aid in the development of a HIV vaccine. Currently, we have 73 mAbs candidate clones, from 12 HIV-infected individuals, and we are evaluating the neutralizing activity of each clone against several HIV-1 subtypes."

"The sera of HIV-1-infected individuals contain both potent and broadly neutralizing antibodies; therefore, understanding how broadly neutralizing antibodies are induced in infected individuals may provide us with valuable insights to develop an effective HIV-1 vaccine."

"Our work on HIV would be the first for producing neutralizing human monoclonal antibodies (Nh-mAbs) to the HIV-1 strains established in Thailand. The knowledge gained from this study may aid in the development of a HIV vaccine"

The effects of medicinal plants and their anti-viral activity have also been of interest for Dr. Pornsawan, as she explains. "We have 15 candidates from Thai medicinal plants, for protection against the influenza virus, 3 of which are very interesting. We hope to develop these 3 candidates and are now evaluating them for their virus inhibition ability using mammalian cells. We will test for toxicity, and then will test if the plants possess anti-viral activities and whether they can neutralize or inhibit replication of the virus."

BACTERIAL RESISTANCE TO ANTIBIOTICS

Of the many projects **Dr. Narisara Chantratita** was involved with in 2011, she says, "One project I'm particularly proud of was that I was able to identify the mechanism of antimicrobial resistance to an antibiotic (ceftazidime) in *Burkholderia* bacteria."

"It's a novel mechanism, which involves the bacteria deleting genes from the genome. The genes deleted are important because they are the genes for coding the antibiotic binding protein, the target of the antibiotic. So, in effect, the bacteria remove the target so the antibiotic cannot bind, resulting in antimicrobial resistance to this family of drugs, representing a significant threat to human health."

"For bacterial infections, we try to see what host factors are associated with susceptibility to infection and outcome. In the north-east of Thailand we have had farmers getting infected by *Burkholderia* either by coming into contact with contaminated soil or inhalation of soil which contains bacteria."

"The basic knowledge gained from our research will be important for the next step in understanding this microorganism. We can learn what genes are important; we can try to stimulate/suppress those genes. We are interested in diagnosis and will try to develop a test used for rapid diagnosis of this disease."

EARLY-STAGE INVESTIGATOR FEATURE

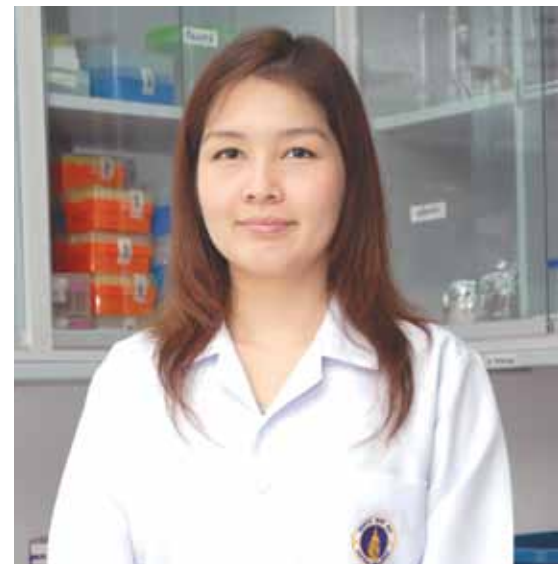
Having just started working in the Department in January 2011, **Dr. Pornpan Pumirat** is an up-and-coming bacteriologist investigating bacterial diseases endemic to Thailand. With the support of the Department and the Faculty she was able to secure funding and space to begin her research, to investigate the mechanism of leptospirosis pathogenesis and identify the genetic variations between strains that relate to pathogenicity.

Her interest in this research stems from a discovery made while she was still completing her PhD studies on *Burkholderia pseudomallei*. She noted a unique correlation between virulence and the abiotic environment. "The north of Thailand has a very high salt content compared with other regions of Thailand," she explains. "I'm not yet sure why, but strains of *Burkholderia pseudomallei* adapted to live in this high salt concentration, and consequentially became more virulent."

In 2012, she hopes to explore this adaptive mechanism further and how it contributes to disease virulence. "I already know which genes are involved, now I just need to investigate more", she said.



*"One project I'm particularly proud of was that I was able to identify the mechanism of antimicrobial resistance to an antibiotic (ceftazidime) in *Burkholderia* bacteria."*



*"The north of Thailand has a very high salt content compared with other regions of Thailand. I'm not yet sure why, but strains of *Burkholderia pseudomallei* have adapted to live in this high salt concentration, and consequentially have become more virulent."*

DEPARTMENT OF PROTOZOLOGY



HIGHLIGHTS



- The Department of Protozoology, headed by **Dr. Supaluk Popruk**, researches and develops molecular diagnostic tools for medically important protozoa
- Researchers in the Department have developed highly sensitive diagnostic kits to identify the pathogen underlying encephalitis in AIDS patients, and identify the life-cycle stage of the *Toxoplasma gondii* parasite in patients
- Targeting DNA replication enzymes, inhibitor compounds for *Plasmodium falciparum* are being explored to address the increasing need for new antimalarial medications
- The Department also works toward developing a species-specific tool for *Entamoeba* infections, utilizing difficult *in-vitro* techniques to culture *Entamoeba histolytica*, which has never been done before in Thailand
- As one of the only laboratories in Southeast Asia with providing the “Sabin-Feldman dye test” which is a gold standard test for *Toxoplasma gondii*, the Department regularly provides training workshops in diagnosis of protozoal infections, diagnostic services for outside hospitals for protozoal infections, and outreach programs to rural hospital workers to educate them about new protozoology-related technologies

“I think that humans, animals, and the environment are all related, and nowadays are affected by global changes,” says Dr. Supaluk. “These changes can contribute to the establishment of emerging or re-emerging tropical diseases.”

Dr. Supaluk Popruk, Head of the Department of Protozoology, describes the focus of the Department as “being about research and molecular diagnosis of protozoa parasites, including intestinal, tissue, blood, and free-living protozoa.”

Many researchers are currently involved with the development of diagnostic techniques to detect protozoan parasites in humans, animals, and the environment. “I think that humans, animals, and the environment are all related, and nowadays are affected by global changes,” says Dr. Supaluk. “These changes can contribute to the establishment of

emerging or re-emerging tropical diseases. I would like to think that we can help physicians somewhat by developing easy and effective methods to detect emerging and re-emerging diseases. It's my hope that this work will improve the treatment of infected individuals."

USING PCR TO DIAGNOSE TOXOPLASMIC ENCEPHALITIS AND DETERMINE THE STAGE OF *T. GONDII*

Toxoplasmosis, the disease caused by the protozoan *Toxoplasma gondii*, is **Dr. Yaowalark Sukthana's** main interest and has been since her days as a student. "When I was a student, there was no one teaching about toxoplasmosis. During that time, there was the AIDS pandemic. *T. gondii* is a very opportunistic organism, waiting for the host's immune system to weaken so it can attack. I became an expert in toxoplasmosis because it was needed, and because there was no one else doing it. Ever since then, it has been my passion." Dr. Yaowalark notes that while toxoplasmosis has a slightly lower prevalence in Thailand than in other endemic countries, there are certain societal risk factors that people must know about to prevent the disease. "The definitive host of *T. gondii* is the domestic cat, which is commonly found all over Buddhist temples," explains Dr. Yaowalark. "I found previously that monks living at the temple, or people who visit frequently, are almost 5 times as likely to contract toxoplasmosis, because of the close contact with cats."

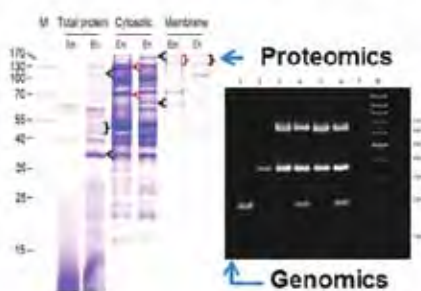
In 2011, Dr. Yaowalark's research focused on developing diagnostic kits that could be used readily in local hospitals. One such kit utilizes duplex RT-PCR methods to determine the pathogen causing encephalitis. In a study investigating encephalitis in AIDS patients, Dr. Yaowalark and her team proved their diagnostic tool to have a very high efficacy, being able to differentiate between toxoplasmosis, cryptococcal meningitis, and tuberculosis – the three most common causes of encephalitis in AIDS patients. In a separate study, her team also developed a serology-based PCR to diagnose, quantify, and identify the life cycle stage of *T. gondii* in patients. "Knowing the stage of *T. gondii* is important, because this determines how the physician treats the patient," says Dr. Yaowalark. "The inactive stage can be harbored within the host their entire life; these patients must be given prophylactic treatment to boost their immunity. If they find the active stage, then they must be given very aggressive treatment, as the pathogen is extremely lethal."

Outside of basic research, Dr. Yaowalark feels it is of the utmost importance to communicate her studies' results and technology to the general public. "We collaborate with 12 university hospitals and the Thai CDC to give our results to the hospitals of Thailand, to train the hospital staff to use our technology for the good of the patients. We also try to publish general results in newspapers so people can learn how to protect themselves from the risk of disease." In addition to disseminating results in Thailand, Dr. Yaowalark and her team are part of a tight-knit network of toxoplasmosis researchers that includes members

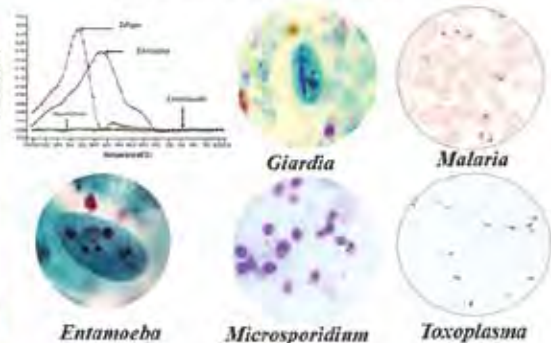


"I found previously that monks living at the temple, or people who visit frequently, are almost 5 times as likely to contract toxoplasmosis, because of their close contact with cats."

BASIC RESEARCH



DIAGNOSTIC DEVELOPMENT





“DNA replication is the first step towards parasite-cell replication. If we can inhibit this process, parasites will reproduce abnormally and infection cannot spread.”



“ Dr. Porntip has been working with Dr. Saengduen Moonsom to develop a simple and accurate technique for the diagnosis of *E. histolytica*. ”

at Cornell University and John Hopkins University in the US, Murdoch University in Australia, and Oxford University in the UK. These partnerships encourage information sharing and researcher training.

DESIGNING AND TESTING ENZYME INHIBITORS FOR *PLASMODIUM FALCIPARUM*

As many researchers of the Faculty recognize, the threat of drug-resistant malaria is growing. In 2011, researchers in the Department of Protozoology approached this problem with an enzymology study. **Dr. Porntip Petmitr** and her team investigated DNA replication and DNA base-repair enzymes in *P. falciparum* malaria, seeking to characterize the enzymes. “We hope eventually to develop inhibitors for these enzymes,” explains Dr. Porntip. “DNA replication is the first step towards parasite-cell replication. If we can inhibit this process, parasites will reproduce abnormally and infection cannot spread.” After developing inhibitors, the team plans to test their efficacy with *in-vitro* models.

However, synthesizing the inhibitor compounds is quite difficult and expensive. Although the Department has funding through the National Research University Initiative, Dr. Porntip and her team need to seek outside expertise with collaborators from Italy, the US, and Belgium. “We have identified a few promising candidate compounds,” says Dr. Porntip. “Now we just need to test them.”

DEVELOPING A SPECIES-SPECIFIC DIAGNOSTIC TOOL FOR ENTAMOEBIA INFECTIONS

Amebiasis, or infections with *Entamoeba histolytica*, has always been an important pathogen for the field of protozoology, displaying clinical presentations of amebic dysentery or liver abscess. However, while the disease remains prevalent, most former experts on the disease have retired. “Initially, there was no-one to take over research on this disease at the Faculty,” says Dr. Porntip. “We have just recently started research on amebiasis again, and we believe its true prevalence in Thailand is underestimated.”

The problem with human *Entamoeba* infection is that it is very frequently misdiagnosed. *Entamoeba* infections are conventionally diagnosed by detecting parasitic cysts, which contain an inactive trophozoite, in a patient’s stool. But there are three species of *Entamoeba* that are nearly impossible to differentiate under a microscope: *E. histolytica*, *E. dispar*, and *E. moshkovskii*. *E. histolytica* is the only pathogenic species, and is believed to account for only 10% of all *Entamoeba* infections. “Because of this, medication is given to too many patients,” says Dr. Porntip. “90% of the patients do not need medication, because their infection is non-pathogenic. Not only is this expensive and wasteful, it increases the risk of *E. histolytica* developing drug resistance.” To address this problem, Dr. Porntip has been working with **Dr. Saengduen Moonsom** to develop a simple and accurate technique for the diagnosis of *E. histolytica*. “I have been investigating proteins, and if I find a protein specific to each species of *Entamoeba*, I will then use these proteins to produce a specific antibody to each species and then try to develop a diagnostic kit,” explains Dr. Saengduen. “For this project, we need *Entamoeba* cells and very pure proteins,” continues Dr. Saengduen. “We need to perform *in-vitro* culture for the large-scale production of cells, but we have no experts in *in-vitro* culture right now.” To address this, the team collaborates with researchers in the Department of Tropical Medicine and Parasitology, Keio University, Japan. Until recently,

no laboratories in Thailand were involved in culturing *E. histolytica*, so the Department had to look outward to receive training. Dr. Saengduen recently received a scholarship to take a postdoctoral position in Japan, which she only just completed.

EDUCATION AND TRAINING

Currently, the Department has 18 students, 6 studying for the Master of Science in Tropical Medicine and 12 working towards their Doctor of Philosophy in Tropical Medicine. "For their thesis projects, students in our Department study various topics, from molecular studies to basic community research. Research is related to all kinds of protozoan parasites, e.g. intestinal protozoa, tissue protozoa, blood protozoa and free living amebae" explains Dr. Supaluk.

The Department has also been providing workshops twice a year, for over 10 years. These workshops provide training in intestinal protozoa and malaria parasites for laboratory technicians from all over Thailand. We coordinate many training sessions and projects with the Office of International Cooperation and other Departments in the Faculty of Tropical Medicine and outside institutes, mostly relating to diagnostic techniques for either intestinal protozoa or malaria parasites. Participants have included Thai and foreign physicians, medical students, health science students and laboratory technicians, and this training is conducted on an annual basis."

DIAGNOSTIC SERVICES

The Department provides a number of services, especially to external hospitals. Hospitals from all over Bangkok send malaria-patient samples for diagnosis with an RT-PCR-based method, to determine the species of *Plasmodium*. The Department has developed specific primer sets for each species, including the newest species of *Plasmodium* found to infect humans, *P. knowlesi*. Hospitals in Thailand also seek the Department's unique expertise and assistance for diagnosing suspected *Entamoeba* infections.

The Department is the only laboratory in Thailand and Southeast Asia that regularly provides and performs the Sabin-Feldman dye test, the gold standard test for *Toxoplasma* serological diagnosis. "We serve more than 100 cases per year," says Dr. Supaluk. "We also provide samples and specimens for various universities and institutes upon request."

PROFESSIONAL TRAINING



FOOD-WATER BORNE DISEASES



ZOONOSIS



MALARIA

DEPARTMENT OF SOCIAL AND ENVIRONMENTAL MEDICINE



HIGHLIGHTS

“ One of the major activities of the Department is coordinating Environment and Health Impact Assessment (EHIA) reports requested from environmental consulting firms. ”

- The Department of Social and Environmental Medicine, led by Dr. Wijitr Fungladda, houses two centers, the Southeast Asian Center for Medical Malacology and the Center for Health Impact Assessment Study.
- Through a strong collaboration with Osaka University, staff of the Department have worked at the Center of Excellence for Antibody Research (CEAR), which in 2011 received a US patent for 20 clones of human monoclonal antibodies capable of neutralizing all four serotypes of the dengue virus.
- One of the main activities of the Department is carrying out Environmental and Health Impact Assessment (EHIA) reports, both domestically and internationally.
- Malacology experts in the Department collaborated with Khon Kaen University to carry out an EHIA report on a hydroelectric dam project in Lao PDR, using their specialty to investigate the project's effects on local medically-important snail populations.
- The Department is one of several participating parties in the National Working Group of Thailand for the Mekong Water Dialogues (MWD) initiative, which seeks to improve water management policy, information sharing, and decision-making on a regional level.
- A three-year project investigating the impact of climate change on gastrointestinal disease pathogens was begun.
- Utilizing the specialty of their two Centers, the Department coordinated a training session on the national standards of EHIA in 2011 and plans two more training sessions in 2012, one of EHIA and the other on medical malacology.

The **Department of Social and Environmental Medicine** is composed of a staff with diverse expertise, including environmental epidemiologist, and environmental toxicologists, malacology specialists, and sociologists. Led by the Head of the Department, **Dr. Wijitr Fungladda**, the Department addresses issues of assessing the health and environmental impact of climate change and industry.

In addition to their research and services, the Department is also the Southeast Asian Center for Medical Malacology, housing the Mollusk Museum, and the Center for Health Impact Assessment Study. Staff of the Department, Dr. Pongrama Ramasoota and Dr. Pannamthip Pitaksajjakul, also maintain a strong collaborative relationship with Osaka University in Japan and have worked at the Center of Excellence for Antibody Research (CEAR). In 2011, CEAR registered for a US patent for 20 clones of human monoclonal antibodies capable of neutralizing all four serotypes of the dengue virus. For more details about CEAR, please see their section in this Report.

CARRYING OUT DOMESTIC ENVIRONMENTAL AND HEALTH IMPACT ASSESSMENTS

One of the major activities of the Department is coordinating Environment and Health Impact Assessment (EHIA) reports as requested from environmental consulting firms. While in Thailand, there are various environmental consulting firms, few teams are qualified to conduct the health and social impact aspect of these assessments. That is where the Department of Social and Environmental Medicine has found their niche, and have proven to be in high demand.

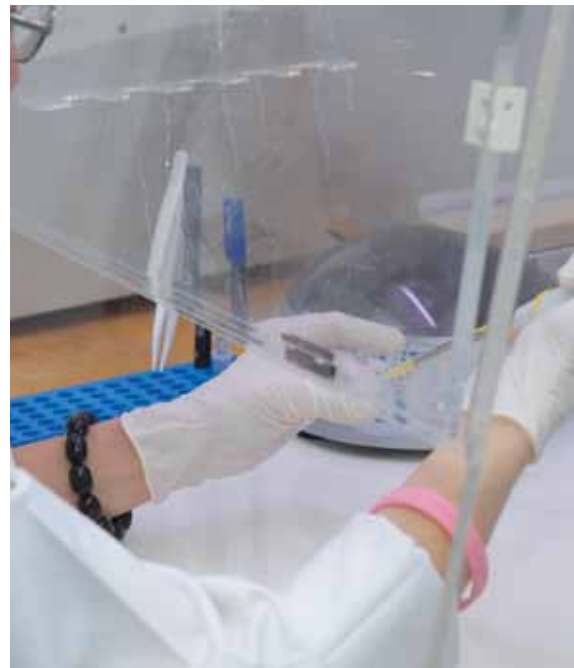
This task is a service that has just recently started, although the Department has already been involved in nine such EHIA reports. Project assessment subjects have varied from dams and power plants to general industry for such high-profile companies as PTT Public Co., Ltd. and TATA Steel Thailand. Using the unique expertise of the Department, the project's impact on traffic, environmental pollution, the local economy, and community health are all investigated.

"We do this because it is a need for our country," says Dr. Wijitr. "We are one of only 6 or 7 other teams with the necessary expertise to carry out a thorough and fair assessment." Dr. Wijitr and his team must not only compile their findings into a report, but then they must present them to the Expert Committees of the Office of Natural Resources and Environmental Policy and Planning for approval of each EHIA report.

However, this service is not only commercial, but has academic purposes as well. In 2011, through these EHIA reports, the Department has also proposed research on the impact of heavy metals on the environment and health in Map Ta Phut in Rayong.

COMPLETING EHIA REPORTS ON AN INTERNATIONAL LEVEL

On occasion, the Department has been commissioned to carry out an EHIA report outside of Thailand. Particularly because of the Department's expertise in medical malacology, the team was commissioned by the Lao PDR government and the Institut Pasteur, based in France, to complete an EHIA report on the Nam Theun Power Company hydroelectric dam project.





Mrs. Pusadee Sri-aroon, the Malacologist of the Department, and her team commissioned by the Lao PDR government and the Institut Pasteur, based in France, to complete an EHIA report on the Nam Theun Power Company hydroelectric dam project.

Mrs. Pusadee Sri-aroon, who was trained in malacology at two separate universities in the US, made several site visits with her team to the dam in the province of Khammouane. The goal of her part in the project was to determine how the dam would affect the indigenous snail populations and the possibility that of it leading to parasite infection outbreaks. Collaborating with researchers from the Faculty of Medicine at Khon Kaen University, Mrs. Pusadee collected samples of medically-important snails and raised them in a laboratory in Bangkok. She later extracted parasitic worms to be identified through PCR at Khon Kaen University.

What Mrs. Pusadee found is that the region had populations of various snail species that are important intermediate hosts for the life cycles of *Opisthorchis viverrini* (liver fluke) and *Schistosoma* spp. (blood flukes). In addition to the presence of snails, she also found that the community behavior, including unsanitary waste management, could lead to a parasite outbreak. However, currently the disease prevalence is low.

WATER QUALITY MANAGEMENT IN THE MEKONG RIVER BASIN

Acting as a participator in the National Working Group of Thailand for the Mekong Water Dialogues (MWD) initiative coordinated by the International Union for Conservation of Nature in Switzerland, the Department seeks to improve the dissemination of water management information and use shared knowledge and improved consensus to contribute to decision making at the national and regional levels. In Thailand, this National Working Group, consisting of academics, governmental officers and NGO workers, continued Phase 2 of the overall project in 2011. Dr. Voranuch Wangsuphachart became involved with this project because of her expertise in water sanitation and its health impact. She has carried out studies on water contamination with fecal matter and how the Mekong River contributes to the spread of diarrheal diseases.

Dr. Voranuch Wangsuphachart, expert in water sanitation and health impact, has carried out studies on water contamination with fecal matter and how the Mekong River contributes to the spread of diarrheal diseases.



INVESTIGATING THE IMPACT OF CLIMATE CHANGE ON PATHOGEN VIRULENCE

Climate change is slowly becoming the focus of several environmental experts around the world, and it is no different at the Faculty. The Deputy Head of the Department, Dr. Suwalee Worakhunpiset, began a project in 2011 that investigates the relationship between climate change and infectious gastrointestinal diseases. Collaborating with the Faculty of Environment and Resource Studies of Mahidol University, she is conducting a retrospective study using 30 years of data about the diseases in the province of Samut Sakorn.

Dr. Suwalee hopes to develop a way to predict how environmental factors such as rainfall, humidity, temperature, and runoff can affect the pattern of infectious gastrointestinal diseases. Although she has encountered obstacles such as a lack of staff or equipment, Dr. Suwalee knows the importance of her research. "We have to learn; we have to care," says Dr. Suwalee. "This information is important, so Thailand can prepare as climate change continues."

EDUCATION AND TRAINING IN THE DEPARTMENT

The Department provides postgraduate training for the MSc or PhD in Tropical Medicine, allowing for specialization in Social Medicine, Environmental Health, and Environmental Toxicology. In 2011, the Department had 10 students, including 4 international students. With funding from the Thai International Development Cooperation Agency (TICA) and the governments of Vietnam and Bangladesh, students were involved in research relevant to their home country and to Thailand, including studies exploring the overall quality of life in certain regions and disease prevention.

The Department also held a 1-week training session in August of 2011 on the national standards of EHIA reports. The session included participants from the Ministry of Public Health, the Electricity Generating Authority of Thailand (EGAT), and several universities.

LOOKING FORWARD

In 2012, the Department plans to strengthen the capacity of its two recently established centers, the Southeast Asian Center for Medical Malacology and the Center for Health Impact Assessment Study, by holding international training sessions on medical malacology and EHIA standards.

Dr. Suwalee Worakhunpiset, began a project in 2011 that investigates the relationship between climate change and infectious gastrointestinal diseases. "We have to learn; we have to care," says Dr. Suwalee. "This information is important, so Thailand can prepare as climate change continues."



DEPARTMENT OF TROPICAL HYGIENE



HIGHLIGHTS



“ Dr. Saranath Lawpoolsri conducts population-based studies using health informatics, which deals with the management and use of information to improve health and healthcare, and improve healthcare delivery. ”

- Focusing their efforts on population-based studies and improving healthcare, the Department of Tropical Hygiene was led by **Dr. Jaranit Kaewkungwal** and Acting Head, **Dr. Saranath Lawpoolsri** in 2011. A new Head of the Department, **Dr. Srivicha Krudsood**, was appointed on 2 April 2012.
- The Department closely collaborates with BIOPHICS, on projects that involve using information technology and geographical information technology to monitor dengue infection in a large cohort of Bangkok schoolchildren and the development of two curriculums: Diploma and Master of Science in Biomedical and Health Informatics.
- Efforts to spread awareness about the risk factors and transmission mechanisms melioidosis are currently in “full throttle” through a collaborative project with MORU, utilizing the internet and social media to provide interactive information sharing.
- Mathematical modeling is currently being used to assess diagnostic tools for dengue fever and to model transmission mechanisms of leptospirosis.
- The Department, as part of the WHO CC for the Clinical Management of Malaria, also acts as a consultant for the Thai Ministry of Public Health to optimize standardized treatment regimens for severe malaria.



Dr. Saranath Lawpoolsri, conducts population based studies using health informatics, which deals with the management and use of information to improve health and healthcare, and improve healthcare delivery. “This is kind of different from other departments, who mostly do laboratory work or clinical trials,” explains Dr. Saranath. “We also do work on malaria, melioidosis, leptospirosis, helminthiasis as well as mother and child care.”

Many of the Department’s projects utilize the **Rajanagarindra Tropical Disease International Center (RTIC)**, located in Ratchaburi Province, which acts as a study site for our population-based studies. One such project studies the dynamics of gametocytemia in *P. falciparum* malarial patients at the RTIC, where the staff of the center has been recruiting volunteers and collecting samples.

“The Department has installed electronic devices in schools to monitor school children absenteeism to track how many children miss school each day. “This type of real time surveillance monitoring will help us in gathering vital data to monitor diseases in schoolchildren as many infectious diseases are initially transmitted in school.”

REAL-TIME SURVEILLANCE MONITORING OF ABSENTEEISM AMONG SCHOOLCHILDREN

Through funding from the National Research University Initiative and collaboration with **BIOPHICS**, the Department established a large cohort of 5,000 schoolchildren in Bangkok to monitor dengue infections. In this project, with the assistance of the Bangkok Metropolitan Administration, the Department has installed electronic devices in schools to monitor school children absenteeism to track how many children miss school each day.

“This type of real time surveillance monitoring will help us in gathering vital data to monitor diseases in schoolchildren as many infectious diseases are initially transmitted in school,” explains Dr. Saranath. “At a certain point, when we observe rising absenteeism, we would be able to react and the school can then be closed to protect against further disease transmission. This type of project can be used as a kind of early stage monitoring program to prevent disease transmission and infection.” This project began in 2011 with a funding grant for 3 years, and it is the hope of Dr. Saranath to find additional funding to continue with this project.





Dr. Direk and his team have also launched the framework of what will ultimately be an interactive website all about melioidosis. After creating a Facebook page dedicated to melioidosis in both English and Thai, they will be organizing a short-film contest for a campaign to know and understand melioidosis.

SPREADING AWARENESS ABOUT MELIOIDOSIS

The disease caused by *Burkholderia pseudomallei*, or melioidosis, is the definition of a neglected disease. "It's frightening because more than 1,000 people die from melioidosis in Thailand each year," says **Dr. Direk Limmathurotsakul**, who has researched melioidosis for the last 9 years. "That is more than dengue and more than tuberculosis. But no one knows about it." Dr. Direk was inspired to dedicate his research to melioidosis after being recruited by the Mahidol-Oxford Research Unit (MORU) and going on a field site visit to Ubon Ratchathani in the Northeast of Thailand. "I think there was previously reluctance to promote the idea that melioidosis affects agricultural workers," explains Dr. Direk. "But there are people dying from the disease who have never even heard of the word 'melioidosis.' I think that is not fair."

In 2011, Dr. Direk and his team completed a large case-control study to learn more about the transmission mechanisms of melioidosis. New evidence was suggesting that the disease can be transmitted through inhalation and ingestion, both of which are possible to prevent. Dr. Direk's findings confirm that evidence, determining that ingesting untreated water or inhaling dust clouds are risk factors for melioidosis. "In some areas of the Northeast, hygiene is very poor. People drink water from wells or boreholes without treatment. Some people treat cuts and wounds by covering it with mud or other organic substances. We conducted home visits and tested samples of drinking water, finding that 10% of the drinking water was culture positive for *Burkholderia pseudomallei*. There is just a general unawareness about the disease."

This unawareness is now what the Department and Dr. Direk are trying to address. Using social media, they are going "full throttle" to educate the public. After creating a Facebook page dedicated to melioidosis in both English and Thai, they will be organizing a short-film contest for a campaign to know and understand melioidosis. Dr. Direk and his team have also launched the framework of what will ultimately be an interactive website all about melioidosis. Providing access to information directed towards both researchers and the general public, they have also created a world map that shows where melioidosis has been reported in humans, animals, or detected in the soil. For more information, see <http://www.melioidosis.info>.

MATHEMATICAL MODELING OF DENGUE AND LEPTOSPIROSIS

Mathematic modeling is a field that has been gaining momentum in medical research. **Dr. Wirichada Pan-ngum** and her team have been focusing on this, using it to study two different diseases. First, through a grant from the Thai Research Fund, the team is using Bayesian Latent Class approaches to assess and optimize diagnostic tools for dengue fever. "We have so far been focusing on potential combinations of serological tests and evaluating an algorithm previously developed by AFRIMS, which has been used as a gold standard in this region," says Dr. Wirichada. The study used retrospective data from different areas to evaluate the model and estimate the sensitivity of several commercial test kits for dengue. "A large-scale dengue outbreak occurs every 2 or 3 years in Thailand," she explains. "Moreover, dengue is often misdiagnosed for various other tropical fevers. Finding a way to improve diagnostic accuracy would tremendously impact our ability to control and manage this disease."



Apart from dengue, Dr. Wirichada and her team received a grant from the Dean's Research Fund in August of 2011 to study transmission routes of leptospirosis in relation to flooding and rodent populations. In light of the flooding crisis that occurred at the end of last year, the significance of this project is even more pronounced. "At the completion of this project, not only will we learn the association between flooding and leptospirosis, we can predict the impact of different strategies for controlling leptospirosis transmission," remarks Dr. Wirichada. "This will serve as a tool for guiding national health policy decisions."

PROVIDING CONSULTATION TO THE WHO AND THE MOPH ON HOW TO MANAGE SEVERE MALARIA

As one of the Departments at the Faculty involved with the WHO Collaborating Center for the Clinical Management of Malaria, researchers in the Department of Hygiene act as a consultant to the Thai Ministry of Public Health. "We try to advise which medications and which regimens should be launched in Thailand, providing the MOPH with our research data," explains **Dr. Srivicha Krudsood**, who has been studying the optimal techniques for treating malaria, especially severe malaria, for more than 22 years.

"Ever since I was a medical student, I always knew I wanted to study malaria," she says. "We are not like other research teams that complete basic science studies. Instead, we have to study patient care and know bedside manner." The question of how to treat malaria has become a major focus of research all over the world as resistance to the current drug regimen becomes more prevalent in malaria parasites. Most of Dr. Srivicha's studies involve testing old drugs in new combinations and dosages to find an ideal non-artemisinin combination therapy. The studies are primarily done in the approximately 200 to 300 severe malaria patients admitted into the Hospital for Tropical Diseases each year.

EDUCATION

The Department allows students to develop their own projects based on their specific interests. Several students come from the MOPH and need to gain an expertise on one particular disease. "I feel it is our job to try to encourage them to do research related to their career," says Dr. Saranath. "After graduation they can continue on their research because it will be related what they do within their career path."

LOOKING FORWARD

In addition to current students enrolled in programs studying Tropical Medicine, the Department is currently collaborating with BIOPHICS, Ministry of Public Health, Faculty of Medicine Ramathibodi Hospital, National Health Security Office, National Science and Technology Development Agency, University of Washington, and Oregon Health and Science University to develop a new curriculum for a graduate diploma and masters in Biomedical and Health Informatics. Funding to develop the curriculum and support a scholarship has come from the Rockefeller Foundation. Right now it's only developing on paper but the Department plan to open this new course by November 2012.

Since 2011, a new Head of the Department has been named. On 2 April 2012, Dr. Srivicha Krudsood became the official Head of the Department of Tropical Hygiene.



Dr. Srivicha Krudsood, who has been studying the optimal techniques for treating malaria, especially severe malaria, for more than 22 years.





DEPARTMENT OF TROPICAL NUTRITION AND FOOD SCIENCE

HIGHLIGHTS

- The Department of Tropical Nutrition and Food Science, headed by **Dr. Dumrongkiet Arthan**, studies nutrition and its relation to genetic and protein changes, cholangiocarcinoma, obesity, dyslipidemia, malnutrition in vulnerable groups, and coronary heart disease
- In 2011, researchers of the Department explored the possibility of using natural extracts from indigenous Thai plants to treat diseases such as cancer, HIV, and obesity
- The Department also conducted studies on the uses and applications of dietary probiotic supplements to inhibit *Clostridium* bacterial infections
- Annual training courses on nutritional assessments and running blood tests to determine vitamin levels are included among the outreach services of the Department



“ Our Department’s main mission is to achieve and update frontier knowledge of the relevant scientific theories, methods, techniques and researcher contributions to the field of nutrition and food science. ”

Dr. Dumrongkiet Arthan, who has only recently taken over as Head of the Department of Tropical Nutrition and Food Science, begins by explaining what the Department is currently involved in. “The Department consists of two main groups of research, tropical nutrition and food science. These individual areas come together under the umbrella of the Department of Tropical Nutrition and Food Science, and form the basis of the research done by our researchers and staff.”

“Our research projects in tropical nutrition investigate areas such as: nutritional status related to genetic and protein changes, cholangiocarcinoma, obesity, dyslipidemia, malnutrition in vulnerable groups, and coronary heart disease.”

In the area of food science, the Department is looking at microbiology and probiotics. “Glycosidase enzymes are of great interest and can be applied in the agriculture and food industries.” In 2011, the Department published 13 papers internationally and 1 paper in a local research journal.

EXPLORING THE USES OF INDIGENOUS PLANTS TO TREAT DISEASE

Dr. Dumrongkiet has also been investigating local resources; “We’ve been looking to Thai medicinal plants and natural products to produce agents which may have beneficial chemical properties in anti-obesity, anti-cancer (especially cholangiocarcinoma), mosquitocidal (vector control in mosquitoes, where the target would be to inhibit enzymes involved in the growth and development of mosquitoes), and anti-HIV properties. We study locally sourced pure natural products and medicinal plants for our research.”

“Our Department’s main mission is to achieve and update frontier knowledge of the relevant scientific theories, methods, techniques and researcher contributions to the field of nutrition and food science.”





Having just received funding from the Thai Research Fund (TRF) in 2011, Dr. Amornrat Aroonnuat explored the possibility of using probiotics to fight infection by Clostridium bacteria.

PROBIOTIC DIETARY SUPPLEMENTS AS INHIBITORS OF CLOSTRIDIUM INFECTION

Having just received funding from the Thai Research Fund (TRF) in 2011, **Dr. Amornrat Aroonnuat** explored the possibility of using probiotics to fight infection by *Clostridium* bacteria. *Clostridium* is one of several infectious agents that cause diarrhea in Thailand; however, it presents a unique threat that most other such agents do not possess. "*Clostridium* is capable of forming endospores, which are not affected by antibiotics," explains Dr. Amornrat. Endospores are an inactive, dormant form that the bacteria can take if the environment becomes unsuitable for it. "Once infected, a patient can have several relapses of *Clostridium* bacteria if endospores are reactivated. This causes difficulties in the long-term treatment of *Clostridium* infections."

Focusing on the potential of nutritional supplements to prevent initial infections with *Clostridium*, Dr. Amornrat collaborates with staff at the Faculty of Science, Mahidol University. If proven effective, she believes these probiotics could be added to commercially distributed yogurt to inhibit *Clostridium* infection from spreading. In the future, she would like to inspect the inhibitory potential of probiotics on helminth infections.

TRAINING AND SERVICES

The Department runs an annual training course entitled 'Methods in Nutritional Assessment and Research'; this course caters for teachers, hospital workers and private-sector workers in the food sciences, and students, and focuses on developing routine assessments, such as nutritional status, anthropometric assessments, computer training for nutritional evaluation, development of food and nutrition guidelines, dietary research, research skills in how to initiate and develop research programs related to nutritional assessment and research. This course has been running for almost 8 years.

The Department provides 4 laboratory services: the determination of vitamin B1, B2, and B6, and the determination of folic acid in human red blood cells. "We are the only provider of this kind of test in Thailand and can provide this as a public service. We hope that in future we can be a nutritional center for vitamin B testing.

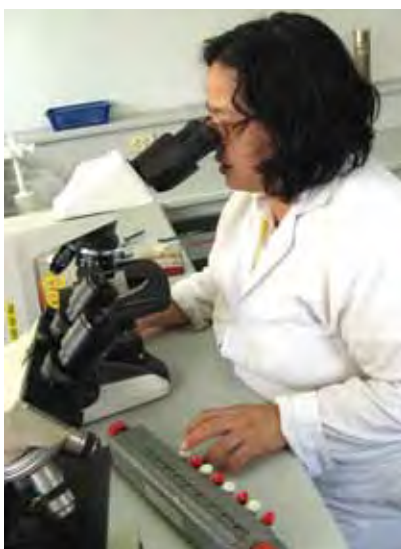


GOALS

"The Department tries to serve the faculty in encouraging our researchers in new areas of frontier research, increasing our scientific publications and providing and distributing knowledge to the community."

This year, as well as continuing to provide services for the detection of vitamin B and folic acid, the Department would also like to develop a method for the determination of vitamins A and E.

"For the future, we would like to increase the number of PhD students we have here at the Department of Tropical Nutrition and Food Science, and we are also trying to find ways in which to increase our budget and support our researchers in finding funding opportunities for their research".



ESTABLISHING CONNECTIONS

The Department has also established international collaborations with such institutes as the University of Potsdam and the Justus Liebig University, Germany, York University in Canada (Nutrigenomics) and Hokkaido University and Hyogo University, Japan, all of which offer not only education but encouragement towards research cooperation, and opportunities to obtain specialized knowledge that the department may not already have.

Dr. Rungsunn Tungtrongchitr emphasizes the benefits of collaboration: "Our collaborations bring opportunities for our students to be involved in the exchange and distribution of knowledge with overseas institutes. This exchange and distribution of knowledge can be done in a variety of ways, including conferences, lectures, and seminars. Previous seminars have included work on cytokines and nutrigenomics in disease. Our students can travel to collaborating countries where new ideas and knowledge can be shared, which will be of benefit to other institutes and will also bring knowledge back into our Department."

"I believe that it is important to distribute knowledge amongst colleagues in the department and also when participating in seminars this helps to reach a broader audience. Some people even say they come to study at the University because they have attended a seminar and have been interested and enthused by the topics and wanted to be involved in the research we do here."



"Our collaborations bring opportunities for our students to be involved in the exchange and distribution of knowledge with overseas institutes."





DEPARTMENT OF TROPICAL PATHOLOGY



HIGHLIGHTS

- Investigating pathogenesis and pathophysiology of organ failure in severe malaria using histopathology, immunohistochemistry and electron microscopy
- Immunocytochemistry and ultrastructural studies of tropical diseases, especially malaria and other parasitic and infectious diseases

The Department of Tropical Pathology is responsible for teaching tropical pathology in the M.Sc./Ph.D. degree programs in tropical medicine, and the postgraduate Diploma in Tropical Medicine and Hygiene (D.T.M. & H.) course.



Head of Department since October 2011, **Dr. Urai Chaisri**, an expert in electron microscopy and immunology, has been involved with guiding the Department's varied research activities. Activities have included the pathology and pathogenesis of severe malaria, ultrastructural studies, cytokine involvement and cell signaling in severe malaria, vascular model studies in the pathogenesis of atherosclerosis, proteomics research, e.g. cancerous squamous cells in the oral cavity and salivary gland tumors, urine biomarkers in malaria acute renal failure, and immunity in gnathostomiasis

RESEARCH

Comprising 3 units (Diagnostic Pathology, Electron Microscopy and, Tissue Culture & Immunocytochemistry), the Department is dedicated to research and delivering high quality teaching to postgraduate students. In 2011, the Department published 8 papers in international journals.

DIAGNOSTIC PATHOLOGY UNIT

The Department's pathologists are experienced in assisting clinicians with difficult diagnoses and clinical management problems, and have a reputation for excellence and reliability.

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By: Professor David J P Ferguson

Professor of Ultrastructural Morphology, Tropical
Department of Clinical Parasitology, University
of Oxford, John Radcliffe Hospital,
OXFORD, UK

ELECTRON MICROSCOPY UNIT

The Unit plays an important role in supporting ultrastructural microscopy analysis. It provides experience for students and researchers in the handling of highly technical equipment to support research interests. The Unit has facilities for both TEM and SEM. Established in 1992, the Unit has consistently produced research work, particularly in the tropical diseases.

COLLABORATIONS

The Department collaborates with international experts in the field of tropical pathology and has a number of experts available for consultation, including Professor Mario Riganti of Mahidol University, Professor David Ferguson, Oxford University, and Dr. Gareth Turner, of MORU.

The Department is also proud of its many research collaborations with organizations and institutes outside the University. International collaborations have included the Division of Electron Microscopy, Department of Cellular Pathology, The John Radcliffe Hospital, Oxford University, UK, the University of Sydney, Australia, the University of Leeds, UK, and Oita and Osaka Universities, Japan.

As well as international collaborations, the Department collaborates nationally with such institutes as Rajavithi Hospital, Bangkok, Department of Microbiology, Faculty of Medicine, Srinakharinviroj University, the Faculties of Dentistry of both Srinakharinviroj and Chulalongkorn universities, and the Department of Parasitology, Faculty of Medicine, Chiang Mai University.

PIONEERING WORK

The staff of the Department contribute continuously pioneering research work in the form of high quality publications and presentations at international conferences. Many of the research activities are performed using light microscopy and electron microscopy, with 3 electron microscopes available for research work on tropical diseases, their vectors and ultrastructural studies.

In 2010, the Department of Tropical Pathology established a prestige Reference Centre for Malaria Pathology, which includes a large collection of rare specimens of tropical diseases, teaching references for malaria and its pathogenesis, a collection of malaria autopsy cases, and research on malaria pathology and pathogenesis.

AWARDS

During the Joint International Tropical Medicine Meeting, 'One World-One Health', in December 2011, the Department gave 3 oral presentations and was delighted when Mr. Chuchard Punsawad, one of their PhD students, won the Oral Presentation Award Consolation Prize for research on the topic 'Expression of caspase-3 in cerebral malaria'.



UNDERSTANDING MALARIA

Deputy Head of Department, **Dr. Parnpen Viriyavejakul** notes "Before the advent of the electron microscope, we didn't know what happened to parasitized red blood cells once they entered the circulation. We were unable to give explanations for the cause and effects of the disease. What clinicians observed wasn't clear, e.g. why do we get cerebral malaria, why do patients become unconscious, why do patients recover after treatment with minimal sequelae? Malaria infection differs from other diseases with CNS involvement, in that other diseases usually have sequelae. So, with the development of ultrastructural studies of malaria parasites, we were able to find out that infected RBC develop surface protrusions, and that these cells sequester and adhere to many tissues, protecting them from the filtering action of the spleen. Sequestration favors the severity of the disease, in which capillaries in vital organs, such as the brain, kidneys, lungs, and liver are obstructed by sequestered parasitized red blood cells."

Her activities have also included the expression of synapsin I in cerebral malaria, apoptosis of liver in malaria, sphingosine 1 phosphate in malaria, diagnosis of ARF in severe malaria by neutrophil gelatinase-associated lipocalin (NGAL) and liver fatty-acid binding proteins (L-FABP), and clinico-histopathological correlation.

Dr. Emsri Pongponratn, of the Electron Microscopy Unit, continues, "Malaria is a severe burden, and at present, we cannot get rid of it. It causes many deaths, so to understand its pathogenesis would help enable clinicians treating this disease. During 2011, I examined the pathophysiology of organ failure in severe malaria using histopathology, immunohistochemistry, and electron microscopy. The aims of this project are to investigate the pathogenesis of cerebral malaria and other severe forms of malarial diseases, including lung injury and acute renal failure. I hope that the outcome of this research can offer a better understanding of the pathogenesis and pathophysiology of severe falciparum malaria, for the development of better therapies for this disease."

Integrating immunology to tropical diseases, **Dr. Yaowapa Maneerat's** pioneering work includes the immune response of hemozoin in falciparum malaria and the activity of excretory secretion from infective stage *Gnathostoma spinigerum* in human cytotoxic immune cells.

The Department carries out routine services for the Hospital for Tropical Diseases, including histopathological diagnosis, cytopathological diagnosis, autopsy, histology, frozen sections, cytology, core biopsies, and fine needle aspiration. They also welcome surgical specimens, for research and diagnosis, from other hospitals or institutes. Training courses for postgraduate students and researchers in tropical pathology, electron microscopy, and histopathology, are provided on request.

GOALS

The Department has received 10 million Baht in funding from the National Research Council of Thailand, The Office of the Higher Education Commission, and Mahidol University under the National Research Universities Initiative, and The Faculty of Tropical Medicine, so for the next 3 years, the Department will be conducting a variety of projects, including research into the pathogenesis of severe malaria, cerebral malaria, acute renal failure and lung injury in severe malaria, and aiming to identify correlations between clinical features and cell signaling events to further explain the pathogenesis in severe malaria.



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For the next 3 years, the Department will be conducting a variety of projects, including research into the pathogenesis of severe malaria, cerebral malaria, acute renal failure and lung injury in severe malaria.

DEPARTMENT OF TROPICAL PEDIATRICS



HIGHLIGHTS

- Phase IIb vaccine trial in 4002 subjects, The first Efficacy and Safety Trial of ChimeriVax Dengue Vaccine in Healthy Children aged 4 to 11 years in Ratchaburi, Thailand, 2009-2014
- Prospective Dengue Burden Study in Bang Phae District, Ratchaburi Province, Thailand, 2011-2012



The Department of Tropical Pediatrics, headed by **Dr. Chukiat Sirivichayukul**, mostly focuses on coordinating clinical trials designed to address the medical needs of children.

One of the main focuses of the Department is research on dengue vaccine trials and dengue burden. The Department is conducting dengue vaccine trials in collaboration with pharmaceutical companies such as Sanofi Pasteur and Inviragen. "One of the goals of the Department is to find an efficacious vaccine, so that we can control dengue," says Dr. Chukiat. "Dengue is a serious threat to pediatric health. In Thailand, over 50% of children at the age of five have already been exposed to dengue virus, although the majority of them are asymptomatic. It is believed that most primary dengue infections occur at a very young age." Working toward this goal, the Department also houses the TropMed Dengue Diagnostic Center (TDC), which provides diagnostic services to patients and to researchers on dengue, and prepares for future dengue vaccine trials.

“ One of the goals of the Department is to find an efficacious vaccine, so that we can control dengue. ”

In addition to conducting clinical research, a number of the Department staff look after pediatric patients as clinical doctors in the Hospital for Tropical Diseases. There, they specialize in general pediatrics, tropical pediatrics, infectious diseases, and allergies.

EDUCATION AND TRAINING

In 2011, the Department had 4 students (2 MSc and 2 PhD), who studied for a degree in Clinical Tropical Medicine (Tropical Pediatrics). One of the requirements to enter the Clinical Tropical Medicine program is already having an MD degree. Students of the Department are able to jump right in and participate in clinical trials and other clinical research. While most students conduct research here in Thailand, one student coordinated a clinical trial on antimalarial drugs in Indonesia.

The Department also coordinates several short-term training sessions. "In 2012, we plan to have a training session for the staff of the Department on the topic 'Good Clinical Practice,'" says Dr. Chukiat. "We will also offer a training course for international participants on dengue and its management, which will be in September."

LOOKING FORWARD

The Department has high ambitions for 2012, and is looking forward to developing 4 new clinical trials, which will investigate the efficacy of influenza and dengue vaccine candidates in children.

One of the main events for the Department will occur by the end of 2012, when the long-awaited results of the ChimeriVax tetravalent dengue vaccine phase IIb clinical trial in Ratchaburi, Thailand, will be made public in Bangkok. In addition, Dr Arunee Sabchareon has been invited to present "Data from the first efficacy trial of dengue vaccine" at a Plenary Symposium at the 61st Annual Meeting of the American Society of Tropical Medicine and Hygiene (ASTMH) at the Atlanta Marriott, November 11-15, 2012.

CLINICAL TRIALS

Staff of the Department of Tropical Pediatrics are involved in dengue research. **Dr. Arunee Sabchareon** is the principal investigator of a Phase IIb vaccine trial in 4002 subjects. The first Efficacy and Safety Trial of ChimeriVax Dengue Vaccine in Healthy Children aged 4 to 11 years in Ratchaburi, Thailand. **Dr. Pornthep Chanthavanich** is the principal investigator for the Prospective Dengue Burden Study in Bang Phae District, Ratchaburi Province, Thailand, 2011-2012. **Dr. Krisana Pengsaa** is a sub-investigator of a multi-center study 'Prospective Surveillance of Febrile Illness





“ Since 2009, I have been the Principal Investigator on a very important study project, ‘Efficacy and Safety of Dengue Vaccine in Healthy Children aged 4 to 11 years in Thailand.’ It is a large Phase IIb study of 4002 children, and the first dengue vaccine efficacy trial. ”



“ We have just finished an inactivated Vero cell-derived Japanese encephalitis vaccine study and are extending it for a further 5 years to study long-term immunity. The first-year follow-up will be in May, 2012.”

for Dengue in Endemic Areas in Asia’ and a multi-center Phase III vaccine trial ‘Efficacy and Safety of a Novel Tetravalent Dengue Vaccine in Healthy Children Aged 2 to 14 Years in Asia’. All describe the trials involved and what hopes they have for trials in the future.

Dr. Arunee Sabchareon, long associated with Mahidol University and the Department of Tropical Pediatrics, describes a current Phase II b Dengue Vaccine Trial. “Since 2009 I have been the Principal Investigator on a very important study project, ‘Efficacy and Safety of Dengue Vaccine in Healthy Children aged 4 to 11 years in Thailand.’ It is a large Phase IIb study of 4002 children, and the first dengue vaccine efficacy trial. The study involved a large number of schoolchildren and it was done in collaboration with Sanofi Pasteur, the Ministry of Public Health, Ratchaburi Provincial Health Office, Ratchaburi Hospital, and 35 primary schools in Muang district, Ratchaburi. This study is aimed to generate information on dengue vaccine safety and efficacy. The vaccine’s efficacy will be announced by the end of 2012, and we hope it will be available on the market in 2015.”

What sort of impact would Dr. Arunee like the research to have? “As a pediatrician, I’m interested in pediatric infectious diseases, especially dengue. It has been an intractable public health problem in Thailand for a long time. It was first recognized in Bangkok in 1958, and the largest epidemic ever recorded in Thailand was in 1987, with more than 170,000 cases. There is currently no vaccine against dengue, and no specific treatment against the disease. Prevention efforts rely on mosquito control and development of tetravalent dengue vaccines.”

“We do believe the vaccine is safe and effective in the prevention of dengue and we hope that it will be successful so that all children who can access the vaccine, not only in Thailand, but in Asia and other tropical countries, will be protected from dengue.”

Dr. Pornthep Chanthavanich, talking about his role in the Department: “My work within the Department involves conducting research, including a prospective dengue burden study and various vaccine trials.

Dengue burden study is an important project that comprehensively studies the burden of dengue infection. The information will be helpful for analyzing the cost-benefit of upcoming dengue vaccination in Thailand. This one-year study began in 2011 and may be extended for another year.”

We have just finished an inactivated Vero cell-derived Japanese encephalitis vaccine study and are extending it for a further 5 years to study long-term immunity. The first-year follow up will be in May, 2012.

Last year, members of the Department presented their results for the Japanese encephalitis vaccine at the 7th World Congress of the World Society for Pediatric Infectious Diseases (WSPID) in Melbourne, Australia.

Describing her research work on dengue, **Dr. Krisana Pengsaa** explains the multi-center study ‘Prospective Surveillance of Febrile Illness for Dengue -Endemic Areas in Asia’. “The study was based in Banpong and Photharam districts, Ratchaburi Province, and finished in 2011. The primary objectives of the study were to identify acute febrile episodes, detect the presence of dengue infection, and develop operational infrastructure for potential Phase III dengue efficacy trial sites.” Dr. Krisana is -currently working with 585 subjects at Banpong and Photharam, as part of the multi-center Phase III vaccine trial ‘Efficacy and Safety of a Novel Tetravalent Dengue Vaccine in Healthy Children Aged 2 to 14 Years in Asia’. There are altogether 10,278 school children from 5 countries--Indonesia,

Malaysia, Philippines, Viet Nam, and Thailand--enrolled in the study. This trial is estimated to be completed in 2015. The study aims to assess the efficacy of the CYD dengue vaccine in preventing symptomatic, virologically confirmed dengue cases. Both projects conducted at Banpong and Photharam are sponsored by Sanofi Pasteur, and Dr. Usa Thisyakorn, consultant of the Department of Tropical Pediatrics and the Faculty of Tropical Medicine, Mahidol University, is the Principal investigator" concludes Dr. Krisana, sub-Investigator.

Members of the Department have also been involved in other interesting research projects, such as "Safety and immunogenicity of heptavalent pneumococcal conjugate vaccine in prevention of pneumococcal diseases in high-risk children" and "Early clinical and laboratory predictive factors for severity of dengue infection". In 2011, they started a collaborative project with Banpong Hospital, Ratchaburi Province, on "Maternally transferred antibody of dengue and chikungunya viruses in Thai infants".

THE 9th INTERNATIONAL CONGRESS OF TROPICAL PEDIATRICS, BANGKOK, OCTOBER 2011

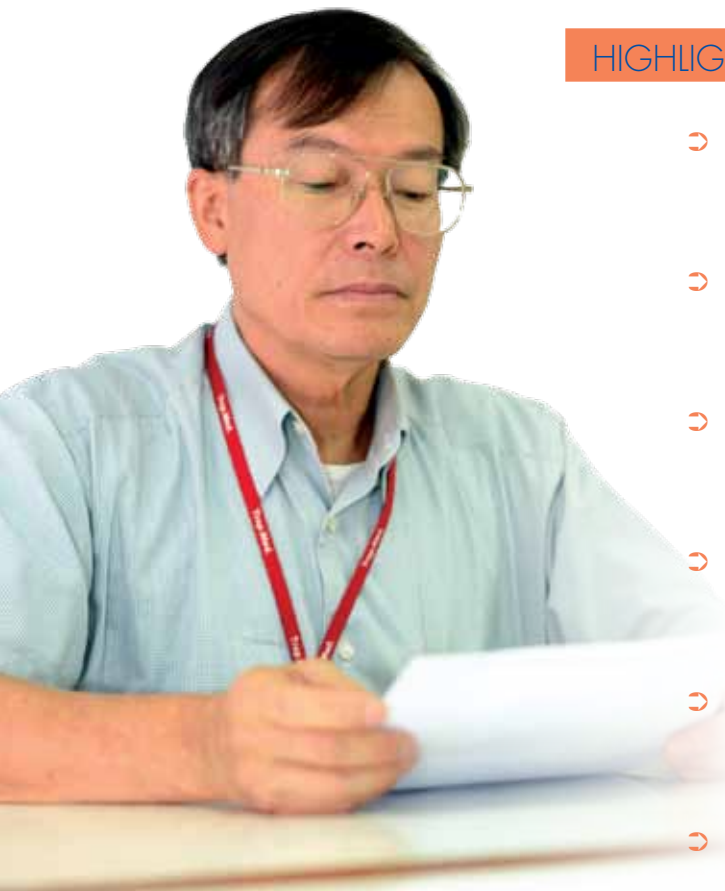
The 9th International Congress of Tropical Pediatrics (9th ICTP) was successfully held under the auspices of the International Society of Tropical Pediatrics in collaboration with the Thailand Chapter of the International Society of Tropical Pediatrics (TCISTP), the Pediatric Infectious Disease Society of Thailand, the Faculty of Tropical Medicine and the Ministry of Public Health in October 18-20, 2011 at the Queen Sirikit National Convention Center (QSNCC), Bangkok, Thailand. Dr. Usa Thisyakorn, the consultant of the Faculty of Tropical Medicine and the Department of Tropical Pediatrics was the president of the 9th ICTP. The 9th ICTP addressed the need for Global Partnerships and Networking for Child Health, emphasizing the latest ideas and strategies in various aspects of Tropical Pediatrics. There were 2 joint congresses, namely the 3rd Travel Medicine and Immunization, entitled "Travel Medicine in the Tropics" on October 18-19, 2011 and the Dengue Conference on October 20, 2011. Members of the Department were involved with the 9th ICTP and the Travel Joint Congress, i.e. Dr. Krisana Pengsaa, the President of the Thailand Chapter of the International Society of Tropical Pediatrics, as the Secretary General, Dr. Pornthep Chanthavanich and Dr. Chukiatt Sirivichayakul as members of the organizing committee. Dr. Watcharee Chokejindachai, Dr. Kriengsak Limkittikul, Dr. Weerawan Hattasingh, Dr. Raweerat Sitcharungsi, and Mr. Chanatthep Pojjaroen-anant, contributed as members of the secretariat committee. Dr. Chukiatt Sirivichayakul was an invited speaker and staff of the Department also presented research work as poster presentations. Dr. Pornthep Chanthavanich (President of Thai Society of Travel Medicine) also helped arrange the Travel Joint Congress. Dr. Usa Thisyakorn and Dr. Krisana Pengsaa are the editors of the Proceedings of the Dengue Symposium at the 9th ICTP, which will be published in the **Paediatrics and International Child Health** Supplement.



Dr. Krisana is currently working with 585 subjects at Banpong and Photharam, as part of the multi-center Phase III vaccine trial 'Efficacy and Safety of a Novel Tetravalent Dengue Vaccine in Healthy Children Aged 2 to 14 Years in Asia'.



DEPARTMENT OF MOLECULAR TROPICAL MEDICINE AND GENETICS



HIGHLIGHTS

- Having just been established in 2010, the Department of Molecular Tropical Medicine and Genetics undertakes research that uses basic science to study tropical diseases
- The Head of the Department, **Dr. Songsak Petmitr**, collaborates with various institutes around Thailand to study the molecular and genetic basis of breast cancer and cholangiocarcinoma.
- In addition to genetic studies of cancer, the Department also explores the therapeutic potential of certain natural compounds for cancer, such as soy extract isoflavones.
- The Department coordinated several different projects focused on acute febrile illnesses, specifically those involving leptospirosis, scrub typhus, and melioidosis.
- In collaboration with the Mahidol-Oxford Research Unit, Department researchers seek to uncover the underlying molecular cause of relapse episodes in vivax malaria.
- Other Departmental projects investigate the genetic basis of drug resistance in *Plasmodium falciparum*, and develop a PCR-based diagnostic test capable of differentiating between various species of *Plasmodium*.
- While the **Department of Molecular Tropical Medicine and Genetics** was only officially established in 2010, the Faculty has been teaching and conducting research on this subject for years. In 2011, the Department had some of the most diverse research topics of any department in the Faculty, including research on both infectious and chronic diseases with collaborators in 8 different countries.

“ Using Affymetrix GeneChip© expression profiling array technology, Dr. Songsak determined that over 400 genes exhibited different expression patterns in women with breast cancer. ”



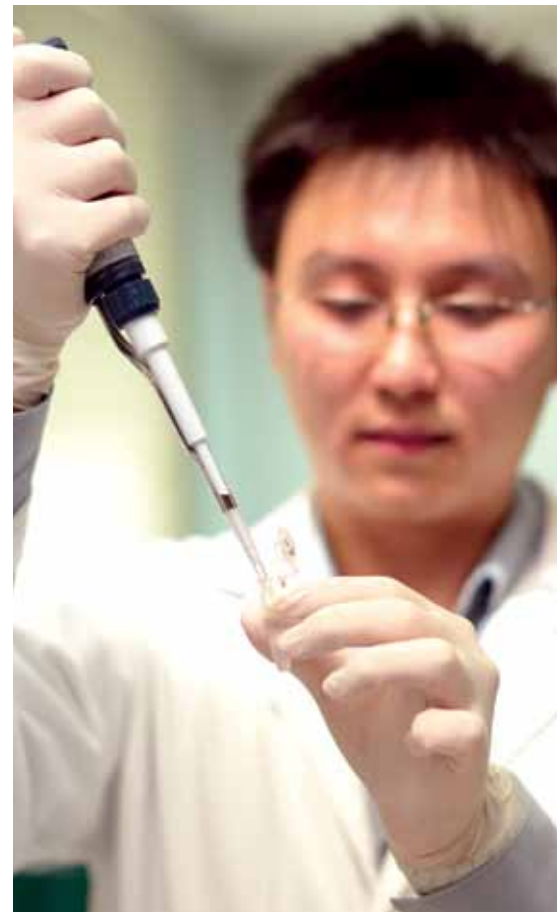
MOLECULAR STUDIES OF CANCER IN THAILAND

Two of the researchers within the Department utilize their expertise in proteomics and genetics to study cancer. **Dr. Songsak Petmitr**, the Head of the Department, looks at differences in gene expression between healthy Thais and those with breast cancer or cholangiocarcinoma. Using Affymetrix GeneChip® expression profiling array technology, Dr. Songsak determined that over 400 genes exhibited different expression patterns in women with breast cancer. As one of the few researchers at the Faculty studying cancer, Dr. Songsak feels that this research is important because, as the average lifespan of Thai people increases, the incidence of cancer and other chronic diseases is also increasing. In particular, the incidence of cholangiocarcinoma (or bile-duct cancer) is relatively high in Southeast Asia. Moreover, the molecular basis of these cancers remains unknown.

Dr. Charin Thawornkuno is taking another approach to studying cholangiocarcinoma by looking at the therapeutic potential of soy bean extract in patients with this type of cancer. Soy extract contains isoflavones, which have been shown to reduce the incidence of breast and prostate cancers. “I would like to prove that this compound is beneficial in treating cholangiocarcinoma,” says Dr. Charin. “Starting from this basis, in the future I would like to identify new compounds or develop a more active compound and find additional targets for the cancer treatment.”



“Soy extract contains isoflavones, which have been shown to reduce the incidence of breast and prostate cancers. “I would like to prove that this compound is beneficial in treating cholangiocarcinoma.””





Dr. Piengchan developed an inexpensive accurate method for the diagnosis of patients exhibiting acute fever with either melioidosis, leptospirosis, or scrub typhus.

DETECTING, DIFFERENTIATING BETWEEN, AND PREVENTING ACUTE FEBRILE ILLNESS

The umbrella term “acute febrile illness” is prominent in many parts of Thailand, many times being used without identifying the underlying agent causing the symptoms. Various pathogens endemic to Thailand cause acute febrile illnesses and the similar clinical presentations of these pathogens often prevent accurate diagnoses for patients.

This is where **Dr. Piengchan Sonthayanon** began her research with the objective of developing a method to differentiate between these pathogens. Using an RT-PCR based protocol, she developed an inexpensive accurate method for the diagnosis of patients exhibiting acute fever with either melioidosis, leptospirosis, or scrub typhus. When asked why she is interested in these neglected tropical diseases, Dr. Piengchan said that it is that “neglected” status that drew her to them. “There are not enough researchers studying it. Even though they are neglected tropical diseases, they are still a problem in Thailand and there need to be researchers to study it.”

In 2011, Dr. Piengchan oversaw a few different projects on this topic. She finished a project investigating rare instances of leptospirosis and scrub typhus co-infections. Then, through funding from the Li Ka Shing Foundation of Oxford University, she began to develop a method to detect *Burkholderia pseudomallei* (melioidosis) in the soil. This method can hopefully be utilized on a large scale to determine where the pathogen is distributed and why, which can hopefully prevent agricultural workers from becoming infected.

EXPLORING THE GENETIC ORIGINS OF *PLASMODIUM VIVAX* RELAPSE EPISODES

In addition to cancer and febrile illnesses, the Department also carries out a number of molecular studies on various species of malaria while collaborating closely with the Mahidol-Oxford Research Unit and other experts in Korea, India, Nepal, Laos PDR, Myanmar, Vietnam, Indonesia, Bangladesh, Pakistan, Afghanistan, Turkey, and Rwanda.

In 2011, one of several studies carried out by **Dr. Mallika Imwong** and her team involved studying the genetic basis of *Plasmodium vivax* malaria relapse episodes, which result from *P. vivax* parasites residing in a patient’s liver. After obtaining clinical samples from relapse episode patients, the team made a very interesting discovery. “We found that people experiencing a first relapse were all infected by a genetically homologous strain of *P. vivax*,” explained Dr. Mallika. However, this important finding does not conclude the study. “While we are one step closer, we still do not know when or why the malaria parasite comes out



Dr. Mallika Imwong and her team studied the genetic basis of Plasmodium vivax malaria relapse episodes, which result from P. vivax parasites residing in a patient’s liver.



of the liver," says Dr. Mallika. "We want to be able to predict when malaria will resurface, so doctors can treat their patients effectively." In the future, this study will involve collecting samples from Korea, Afghanistan, and Cambodia, to see if the relapse-causing strains are genetically similar to the ones in Thailand.

GENETIC STUDIES OF *P. FALCIPARUM* AND *P. OVALE*

In addition to *P. vivax* studies, Dr. Mallika and her team investigate three other species of malaria. This year, she sought to examine the genetic basis for drug resistance in *P. falciparum*, by using samples from the Thai-Cambodian border, where artemisinin resistance is emerging, and samples from Rwanda, Africa, where antifolate resistance is prevalent. Through the latter study, Dr. Mallika managed to identify 4 genetic mutations correlating to antifolate resistance.

There was also work to develop a PCR-based diagnostic technique to differentiate between the different species of malaria, based on rRNA and cytochrome b genes. Having been part of the team that reported the discovery of two subspecies of *P. ovale*, Dr. Mallika is now using that technique to investigate the genetic sequence variation between the two subspecies further.

While carrying out these molecular-based studies, Dr. Mallika never loses sight of the actual patients afflicted with malaria parasites. "Our samples come directly from patients, and our results and recommendations always go directly to public-health policymakers," says Dr. Mallika. "The ultimate goal is for our research to result in better treatment outcomes for patients."

EDUCATION AND TRAINING

The Department currently has 5 students and hopes there will be more in the future. In 2011, the Department collaborated with the IT unit to hold a 3-day workshop on the subject "Proteomics for Tropical Medicine" for all interested researchers.

LOOKING FORWARD

In 2012, Dr. Piengchan plans to begin a new project funded by the Thai Research Fund using MALDI-TOF mass spectrometry to characterize *Leptospira*. Using this technology, leptospirosis will be identified through the peaks seen on a mass spectrometer. In addition, part of her goal for 2012 is to find a better means for disseminating information about her research to rural hospitals and communities.

Dr. Songsak also plans to organize academic training in bioinformatics for Faculty staff, and develop more molecular-based curricula for PhD and MSc students. The Department hopes to begin providing diagnostic services for certain types of cancer and leptospirosis very soon.





HIGHLIGHTS



- Phase I/II safety and immunogenicity of a pandemic live attenuated influenza vaccine (PLAIV) candidate strain A/17/CA/2009/38 (H1N1)
- Safety, Immunogenicity and Efficacy Studies of WRSS1, a Live Attenuated Shigella sonnei Vaccine Candidate
- A Randomized, International, Double-Blinded (With In-House Blinding), Controlled With GARDASIL™, Dose-Ranging, Tolerability, Immunogenicity, and Efficacy Study of a Multivalent Human Papillomavirus (HPV) L1 Virus-Like Particle (VLP) Vaccine
- Phase III Clinical Trial to Study Immunogenicity, Tolerability, and Manufacturing Consistency of V503 (A Multivalent Human Papillomavirus [HPV] L1 Virus-Like Particle [VLP] Vaccine)
- Efficacy and Safety of a Novel Tetravalent Dengue Vaccine
- Phase I safety and immunogenicity of live attenuated influenza H5 candidate vaccine strain A/17/turkey/Turkey/05/133 (H5N2)

VACCINE TRIAL CENTRE (VTC)



The Vaccine Trial Center (VTC) is the first and only clinical trial facility in Thailand, where the efficacies of newly developed vaccines, against different infectious diseases, are evaluated in human volunteers. Many of the activities conducted within the VTC overlap with the Department of Clinical Tropical Medicine.

Prof. **Punnee Pitituttithum**, Chief of Clinical Trials Projects, explains some of the work done at the VTC. "We are currently conducting phase 3 clinical trials on a Human Papilloma Virus (HPV) vaccine using a new generation quadrivalent vaccine against cervical cancer. We are also working on phase 1 and phase 2 studies on Chikungunya virus in an effort to produce a vaccine."

The VTC is responsible for research studies into many infectious diseases. The umbrella of the VTC covers malaria, AIDS vaccine, dengue, influenza and avian flu vaccines.

Dr. Punnee is also the principal investigator for HIV vaccine, HPV vaccine, Shigella vaccine, Flu vaccine, and Dengue vaccine projects at the Vaccine Trial Centre. She has also received the highest citation count for research papers from 2005 – 2009, based on the Scopus database in Biological science from Mahidol University on July 25, 2011.

The staff at the VTC comprise of a mixture of Doctors from the Department of Clinical Tropical Medicine, nurses from the Hospital for Tropical Disease and various other staff that are hired by the needs of ongoing projects. There are no students working directly with the VTC as the vaccine projects traditionally take a longer time prior to producing results, so academic projects at the VTC wouldn't be feasible for students to undertake.

Looking towards the future, Dr. Punnee continues, "The Vaccine Trial Center should expand in scope to cover phase 4 clinical trials, we will continue to develop our translational and operational research capabilities. Our expertise expands from phase 1 to phase 3, so next year and onwards we will focus more on translational and operational research, leading to more of an impact on people and policies involved in vaccine development and licensure."

" Our expertise expands from phase 1 to phase 3, so next year and onwards we will focus more on translational and operational research, leading to more of an impact on people and policies involved in vaccine development and licensure. "





CENTER OF EXCELLENCE FOR BIOMEDICAL AND PUBLIC HEALTH INFORMATICS (BIOPHICS)

HIGHLIGHTS



Over the past 10 years, the academic services provided by BIOPHICS covering data management and data analysis have been performed with the systems in an environment regulated by US-FDA compliance standards.

- The Center of Excellence for Biomedical and Public Health Informatics (BIOPHICS), led by **Dr. Jaranit Kaewkungwal**, has two main missions: public health informatics (PHI) and clinical data management (CDM).
- In the field of PHI, as mobile technologies have proven to be a revolutionary tool in public health informatics, BIOPHICS has developed cutting-edge mHealth (mobile health) systems. The WHO, the Global Fund Round 10, and Bill & Melinda Gates Foundation “Grand Challenges Explorations” have awarded grants to support current BIOPHICS mHealth projects.
- In the field of CDM, BIOPHICS acts as a collaborator or consultant with WHO, AFRIMS, and various national and international governmental and commercial pharmaceutical companies, assisting with data management in disease surveillance, and several high-profile clinical trials.
- BIOPHICS, working with the Department of Tropical Hygiene, with Rockefeller Foundation support, plans to launch its new curriculum offering students a chance to obtain a Graduate Diploma and MSc in Biomedical and Health Informatics in November 2012.
- As part of the academic institute, short-term training sessions coordinated by BIOPHICS included a national course in clinical data management and the annual international Workshop in Public Health Informatics; with the Thailand Center of Excellence for Life Science (TCELS), BIOPHICS has arranged training for data standards for biomedical and clinical trial studies.

The **Center of Excellence for Biomedical and Public Health Informatics (BIOPHICS)**, which established in 1999, has two main tasks. First, they coordinate the data management of clinical research for both private pharmaceutical companies and governmental organizations. Secondly, they assist with long-term health informatics projects, namely those involving disease surveillance.

Over the past 10 years, the academic services provided by BIOPHICS covering data management and data analysis have been performed with the systems in an environment regulated by US-FDA compliance standards; the CDM and IT teams also develop customized systems for biomedical study management, such as patient tracking, automatic AE/SAE reporting mechanisms, and respondent-driven surveys.

BIOPHICS is directed by **Dr. Jaranit Kaewkungwal** and consists of 27 full-time staff and 6 part-time collaborators from other Departments within the Faculty, including the Department of Hygiene and the Department of Social and Environmental Medicine. "Our staff come from many different backgrounds," says Dr. Jaranit. "We have specialists in statistics, quality assurance, IT, data management, and management information systems. We are one of the few institutes in Thailand with this kind of expertise and capability for the work we do."

Dr. Jaranit previously worked as a detailee at the Thailand Ministry of Public Health at the Thailand-US Collaboration on HIV/AIDS. "I was recruited by Prof. Dwip Kitayaporn to come and work at the Faculty as a lecturer at the Department of Social and Environmental Medicine and also at the newly established Data Management Unit, which grew out of a grant from the pharmaceutical company VaxGen," says Dr. Jaranit. "In 2008, under Dean Pratap Singhasivanon's supervision, we expanded the Data Management Unit into a Center of Excellence with partial funding from the Rockefeller Foundation, which allowed us to develop into the Center that we are today. We owe Dr. Donald Francis of VaxGen and Dr. Karl Brown of the Rockefeller Foundation a lot for what we have become."

REVOLUTIONIZING METHODS OF DISEASE SURVEILLANCE AND PATIENT FOLLOW-UP

One of BIOPHICS' health-informatics projects concluded in 2011. What started as a small project under a **Microsoft Research Grant** in two districts along the Thai-Myanmar border later expanded to cover 7 provinces through funding from **WHO-BMGF**. In this project, BIOPHICS researchers implemented the use of cell-phone technology for detecting malaria. This system aimed to increase the early detection of cases, patient compliance, and encourage follow-up visits. "We worked together with the Ministry of Public Health to launch the electronic Malaria Information System, so called eMIS, in 7 provinces along the Thai-Cambodia border," says Dr. Jaranit. "Although this WHO-BMGF-supported project concluded in 2011, we are now expanding the project for the next 5 years with Global Fund Round 10 support. The new project will be nation-wide, covering



"We have specialists in statistics, quality assurance, IT, data management, and management information systems. We are one of the few institutes in Thailand with this kind of expertise and capability for the work we do."





In November 2011, out of over 3000 proposals around the globe, BIOPHICS was one of 108 projects awarded a BMGF Grand Challenges Explorations Grant, which they will use to pursue a prototype for mobile technology applications to improve vaccination strategies for stateless children in hard-to-reach areas.

43 provinces along the Thai-Cambodia and Thai-Myanmar borders.”

If this methodology seems unorthodox, it is for that very reason that **Bill & Melinda Gates Foundation “Grand Challenges Explorations”** awarded BIOPHICS a grant to complete a similar project targeting stateless hill-tribe children. In November 2011, out of over 3000 proposals around the globe, BIOPHICS was one of 108 projects awarded a BMGF Grand Challenges Explorations Grant, which they will use to pursue a prototype for mobile technology applications to improve vaccination strategies for stateless children in hard-to-reach areas.

“These populations of stateless children are important targets for disease control and vaccination strategies, because the move freely across borders,” says Dr. Jaranit. The main objective of the project is to build an effective mechanism using a cell-phone based solution to achieve the Expanded Program of Immunization (EPI) coverage targets among this under-served and extremely vulnerable group. If successful, the expectation is that the initiative could be adopted elsewhere with similar settings.

The solution will include two system functionalities on phone-to-phone information sharing for identification and prevention. Identification refers to case registration into the EPI scheme for stateless children, while prevention refers to case management of the receipt of fundamental vaccinations, plus health communications aimed at behavioral change, to improve healthcare-service-seeking and -access behaviors.

“We are given 18 months to prove that our idea is viable and effective,” explains Dr. Jaranit. “We are hurrying to develop the method, so we can show its usefulness and expand it for other uses.” If it is shown to be effective, this method could be applied to include maternal healthcare and childhood diseases and nutrition.

ACTING AS A CONSULTANT AND COLLABORATOR IN DATA MANAGEMENT

BIOPHICS continues to develop a reputation for excellence by acting as a consultant in a variety of capacities. As a consultant to the **World Health Organization (WHO)**, BIOPHICS assists in archiving and managing data on disease surveillance, customizing a system specifically for WHO projects. “We track patients using GIS and measure outbreaks, particularly in refugee camps along the border,” says Dr. Jaranit.

BIOPHICS also collaborated with the **Armed Forces Research Institute of Medical Sciences (AFRIMS)** on two projects: a 7-year project on an HIV vaccine trial and preparations for a future malaria vaccine. BIOPHICS also acts as a consultant for commercial entities, such as Novartis, Sanofi Pasteur, and Janssen Pharmaceuticals.

EDUCATION AND TRAINING

In 2011, BIOPHICS continued to work toward developing a new curriculum in Biomedical and Public Health Informatics. This program is expected to be launched in 2012, and will offer both a graduate Diploma and an MSc degree in the field. “There was a serious educational gap in that there was no public health informatics program offered in this

region [Southeast Asia]," says Dr. Jaranit. "The **Rockefeller Foundation** recognized this gap and chose the Faculty to develop the curriculum. It has been an ongoing project since 2008, and is currently in the pipeline, awaiting approval from the Mahidol University Board." In addition to launching the program, BIOPHICS and the Department of Tropical Hygiene are starting a scholarship fund for the two batches of students. The scholarship will allow for 12 graduate Diploma students and 6 MSc students in the first academic year.

Other than long-term education, one of the key functions of BIOPHICS is offering training sessions to educate other research institutes, both domestic and international, about data management and health informatics. In 2011, BIOPHICS held two such sessions.

Through funding from the **Thailand Center of Excellence for Life Sciences**, BIOPHICS coordinated a training session on data management methods. As a national training center for clinical data management, BIOPHICS coordinates a 5-month distance training course for data managers all over Thailand to obtain certification.

BIOPHICS collaborated with the University of Washington to hold its annual **Workshop on Public Health Informatics**. The workshop introduced the discipline of public health informatics to an elite group of public health and information technology experts from the SEAMEO countries (Vietnam, Yunnan (PR China), Cambodia, Lao PDR, Myanmar, Indonesia, the Philippines, and Thailand) and included topics on the application of the latest advancements in information science and technology to support public-health practice, education, and research.

LOOKING FORWARD

BIOPHICS hopes to continue expanding, directing its future capacity-building projects to more laboratory and basic science. "We are purely an academic institute, not one for profit," says Dr. Jaranit. "Because of this, we must develop alongside academia. We will do more on clinical data management regarding quality assurance and regulatory issues. We have had quite a lot of success with PHI applications, but we will continue searching and implementing cutting-edge technologies to help improve healthcare services, not only for the country, but beyond. With more emphasis being placed on clinical and molecular studies, we hope to expand beyond public health informatics and into clinical and molecular informatics."



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THE MAHIDOL OXFORD TROPICAL MEDICINE RESEARCH UNIT (MORU)

HIGHLIGHTS

- Professor Nicholas White received the highly prestigious Prince Mahidol Award
- During 2011, the Unit had 142 published papers
- Pharmacokinetic studies to determine the optimal doses for administration to particular populations, e.g. children and pregnant women
- Artemisinin combination therapy (ACT) pioneered at MORU, is now the standard worldwide for treating *P. falciparum* malaria
- AQUAMAT – largest ever study in severe malaria, resulting in revised WHO guidelines making artesunate the first-line treatment for severe malaria worldwide
- TRAC (Tracking Resistance to Artemisinin Collaboration) - surveillance network to track where artemisinin-resistant parasites are spreading

The Mahidol Oxford Tropical Medicine Research Unit (MORU) was established in 1979, as a collaboration between Mahidol University, the University of Oxford, and the Wellcome Trust. In 2011 the Unit had a staff complement of around 500 members, with about half working at the Shoklo Malaria Research Unit (SMRU) in Mae Sot, on the Thai-Myanmar border. MORU is a focal point for ongoing studies in affiliated centers and hospitals around Thailand, Laos, Vietnam, Cambodia, Myanmar, and beyond.

A few examples of the key areas of research MORU undertakes include:

- Tracking the emergence, spread and implications of anti-malarial drug resistance
- Developing rapid, affordable diagnoses and treatments for infectious diseases
- Developing new treatments for malaria (particularly in pregnant women)
- Identifying counterfeit medicines, and publicizing ways that they can be recognised

CLINICAL PHARMACOLOGY IN MALARIA

Professor Nicholas Day joined MORU in 1991 from the Oxford Universities Clinical Research Unit (OUCRU) in Vietnam, and since 2003 has been Director of the Unit. MORU is currently collaborating on about 200 projects, covering a variety of diverse research subjects, including projects on epidemiology and diagnosis, pathophysiology and treatment of malaria, melioidosis, leptospirosis, scrub typhus, and other tropical diseases. The Unit has study sites across Southeast Asia, and in Africa.



Prof. Day describes the Unit's activities. "Lots of our work last year, (2011), was based on artemisinin-based drugs, which have been pioneered over the last 20 years by MORU and our sister site, OUCRU (Oxford University Clinical Research Unit) based in Saigon, Vietnam. Our research on artemisinin combination therapies (ACT) led to the current standard treatment worldwide as first-line treatment for *falciparum* malaria, recommended by the World Health Organization (WHO). ACTs have largely been developed at the Shoklo Malaria Research Unit (SMRU), which is based in the town of Mae Sot, in Tak Province, on the Thai-Myanmar border. Their use has been determined by lots of studies, including pharmacokinetic-pharmacodynamic relationships. We have worked out how to measure these drugs properly in blood in our pharmacology laboratory here in the Faculty, so now we are able to do proper pharmacokinetic studies to work out what are the best doses to give, particularly in populations where this has not been worked out properly before, e.g. children and pregnant women, in particular."

PROLIFIC RESEARCH

The Unit at Mahidol has been prolific in its work over the years, as Prof. Day explains, "Loads of work has been done, so I cannot single out any specific people, however, Professor Nick White, Chairman of the Wellcome Trust Southeast Asia Tropical Medicine Research Units, in Saigon, and MORU, received the highly prestigious Prince Mahidol Award, a great honor for him, the Unit, and the Faculty. This award, of international standing, was given in recognition of his, the Unit's, and the Faculty's work on artemisinin drugs."

"For the treatment of severe malaria, we have recently completed the AQUAMAT (African Quinine Artesunate Malaria Trial) study, which was coordinated from the Faculty. This study took place in 9 countries in Africa and was the largest ever study in severe malaria, with 5500 African children with severe malaria involved. The study looked at the effects of artesunate versus quinine treatment. The use of artesunate was associated with a 23% reduction in mortality. Thus, following the study, the WHO issued revised guidelines, making artesunate the first-line treatment for severe malaria everywhere, not just in adults or non-immune people, but in children in high transmission areas, such as Africa, where the largest number of people die of malaria. This was a very important achievement for this Unit and for the Faculty, as it was fully conceived and coordinated from here."

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DRUG RESISTANCE AND MALARIA

According to the WHO, artemisinin resistance appears to be spreading, with counterfeit anti-malarial drugs now a growing problem.

Elaborating on this issue, Prof. Day continues, "One of the worries in the malaria world is the emergence of resistance to artemisinin and its derivatives. It has become apparent in the last 2-3 years that this has begun to emerge on the Thai-Cambodian border. We have been involved in detecting that resistance and one of our achievements during 2011 has been the funding, setting-up, and coordinating of a network of 13 clinical study sites across Asia, and 2 in Africa, to track the spread of resistance to the artemisinins. Because there is no simple test for artemisinin resistance, you have to look at the response in a patient to check for resistance in a particular area. Working out how far resistance has spread is vital in developing a containment policy. We call this program TRAC, Tracking Resistance to Artemisinin Collaboration. It has been very successful; most sites are recruiting patients, so now we have a surveillance network to work out exactly where the resistant parasites are spreading."

Prof. Arjen Dondorp, the Deputy Director of MORU, takes a personal interest in intensive-care medicine and malaria research. He works to develop protocols that can improve outcomes in severe malaria, contributing to MORU's influence and outreach. In addition to spending a third of his time in Mozambique and Bangladesh, where severe malaria is much more prevalent, he also assists in the development of severe malaria treatment training programs in Nepal, India, and Bangladesh. But according to him, severe malaria, especially cerebral malaria, still requires much attention: "A more systematic approach to treating this disease is necessary to improve clinical outcomes," says Prof. Dondorp. "We aim to have an impact on individual hospitals in critical areas and to have a capacity-building aspect in all of our activities."

MOVING AWAY FROM MALARIA

The work on malaria at MORU continues to be one of the Unit's main focuses. However, they are also involved in many other research projects. "We continue to do a lot of work on melioidosis up in Ubon Ratchathani and other sites in the Isaan area of Thailand. This is a devastating disease, which in Thailand probably causes 100 times more deaths than malaria does. There is very little known about it, so we are trying to raise the public profile in Thailand," explains Prof. Day.

The Unit also took part in an effort to assess whether leptospirosis was a problem during the recent flooding in Bangkok. Prof. Day continues, "We offered free testing to organizations, offered on behalf of the Faculty, in order to see if we could detect leptospires in the flood water, and investigate whether they were pathogenic, or not.

"We are also continuing to work on scrub typhus. At the moment we are in the process of setting up a joint collaboration with the Armed Forces Research Institute of Medical Sciences (AFRIMS), to establish a program to develop non-human models of scrub typhus. We'll look to define the immunopathophysiology of the disease and begin a program that will look at developing a vaccine."

"One of the worries in the malaria world is the emergence of resistance to artemisinin and its derivatives. It has become apparent in the last 2-3 years that this has begun to emerge on the Thai-Cambodian border."

MODERN LABORATORY FACILITIES

Describing the facilities at MORU, Prof. Day comments, “Our pharmacology laboratory, in my opinion, is the best for the measurement of anti-malaria drugs and anti-influenza drugs in the world. Our ability to analyze results in terms of pharmacokinetic-pharmacodynamic modeling is also very good”, Prof. Day notes.

MORU also has the distinction of having a fully operational BioSafety Level 3 laboratory, based at the Faculty. “We recently obtained a select agent rating from the Center for Disease Control (CDC), which means we can apply for US funds to do research work on agents that are considered as biothreats, such as *Burkholderia pseudomallei*, the causative agent for melioidosis. This was very tough to achieve and many US laboratories fail to pass this inspection, so it’s a major feather in the cap for the Faculty and the University,” comments Prof. Day.

COLLABORATIONS

As well as working on their own projects within the Faculty, the Unit has also been busy with collaborations from outside the University. Prof. Day explains, “We’ve around 200 active international collaborations ongoing at the moment. It’s difficult to single any specific collaboration, but some projects we are running now involve trying to revitalize the Southeast Asian Infectious Diseases Clinical Research Network (SEAICRN), and we also want to work closely with other units doing clinical trials, design and monitoring, ethics in the tropics, and data management. Our clinical trials support group is heavily involved in this aspect and are constantly updating and databasing all our work, so we know exactly where we are with each project and how funding currently stands for that project. We’ve also created a network for the whole Unit, which includes all our study sites in Thailand and our other sites located in Cambodia, Laos, Bangladesh and Africa.”

FUTURE ENDEAVORS

When asked what the Unit will be working towards in the future, Prof. Day explains, “We would like to continue to work on the description of artemisinin resistance, the surveillance of resistance and work out exactly how far it has spread. Our mathematical modeling department is looking to develop the best strategies for the containment of resistance, but most of all, we would like to discover the underlying molecular basis for resistance, which is unknown at the moment, so that is something we are aiming for.

“We’ll continue studying malaria, with regards to using primaquine in treatment. Primaquine is an old drug used for malaria that is very under-used and very under-understood, despite a lot of work done in the 50’s and 60’s on it. So we want to find out definitively the best treatment regimen for the radical treatment of *P. vivax* malaria, so we can prevent relapse from liver merozoites. That will be very important in the terminal phase of malaria elimination. We also want to work out how to use single doses of primaquine for the blocking of transmission of *P. falciparum*, and work out the exact safety profile of primaquine in various doses.

“In terms of microbiology, we will start focusing on severe sepsis generally, looking at treatment and diagnosis. We’re hoping to setup a multi-center study across Southeast Asia to look at that.”

EDUCATION

MORU is a postgraduate institute with 36 PhD students working at the Unit, and about 10 MSc students. Most students are Thai, and about half do their PhDs through Mahidol University. Students also work with Oxford University, the London School of Tropical Medicine and Hygiene, and the Liverpool School of Tropical Medicine. MORU teaches students as part of the D.T.M. & H. course at the Faculty.

SERVICES

“The Unit fully supports efforts of the Faculty in the development of diagnostic testing. We are a major reference center for the measurement of anti-influenza drugs, and with about 200 collaborations, we are able to share samples between laboratories. The US CDC have also sent us samples of the drug Tamiflu, to measure its pharmacokinetic values, and we’ve also received samples from other agencies and institutes, e.g. the UK influenza network sends us samples for diagnostic testing.” concludes Prof. Day.

CENTER OF EXCELLENCE FOR ANTIBODY RESEARCH (CEAR)



HIGHLIGHTS

- The recently established CEAR, led by **Dr. Pongrama Ramasoota**, is a partnership between the Faculty of Tropical Medicine and Osaka University.
- In 2011, a US Patent was issued jointly to CEAR and Osaka University for the isolation of 20 clones of human monoclonal antibodies capable of neutralizing all four serotypes of the dengue virus.
- Operating under the umbrella of CEAR, the Mahidol-Osaka Center for Infectious Diseases (MOCID), led by Director Dr. Kazuyoshi Ikuta and Vice Director Dr. Tamaki Okabayashi, study various aspects of dengue and Chikungunya fever, including a basic-science approach to elucidating the mechanism of the immune response to mosquito bite.
- Within CEAR, the BIKEN-Endowed Department of Dengue Vaccine Development, chaired by Dr. Eiji Konishi, was established in October 2011, to continue efforts to develop a DNA vaccine against dengue.
- Early-stage investigator feature: Dr. Pannamthip Pitaksajakul.



“CEAR is designed to be a center for discovery, where we find new therapeutic antibodies against tropical diseases.”

The Center for Excellence in Antibody Research (CEAR) was established as a joint collaborative center between the Faculty of Tropical Medicine, Mahidol University and Osaka University through a 50 million Baht equipment grant from the Japan International Cooperation Agency (JICA). The product of an ongoing collaborative relationship between the current head of CEAR, Dr. Pongrama Ramasoota, and Dr. Kazuyoshi Ikuta of Osaka University, CEAR was set up with a very focused mission: “Before CEAR was set up, the Faculty of Tropical Medicine was already very accomplished in things like clinical trials, where existing therapeutics are tested,” says Dr. Pongrama, “but CEAR is meant to be a center for *discovery*, where we find new ones.” 2011 saw several projects dedicated to developing therapeutic and diagnostic antibodies against tropical diseases.

Dr. Pongrama believes that antibody development is the future of therapeutics and antibodies. “Many biotechnology companies, in Japan and in the US, are pursuing the use of antibodies for therapeutics. It is a definite trend.”

NEUTRALIZING HUMAN MONOCLONAL ANTIBODIES AGAINST DENGUE

One of CEAR’s defining achievements of 2011 was undoubtedly the successful patent of therapeutic antibodies against dengue. Dr. Pongrama, Dr. Ikuta, and their team, managed to obtain 20 clones of human monoclonal antibodies that neutralize all 4 dengue serotypes. “This is important because we don’t have a specific drug yet to treat dengue,” says Dr. Pongrama, discussing the significant impact these antibodies may have on dengue treatment.

In 2012, CEAR hopes to utilize antibody engineering technology to further purify these antibodies. By modifying and amplifying the human genes that code these antibodies and inserting them as a vector into mammalian cells, they hope to obtain more specific antibodies. After that, CEAR hopes to progress with running animal trials to test the efficacy of the antibodies developed.





Dr. Eiji Konishi, from Kobe University and Osaka University, decided to relocate his research facilities to the Faculty of Tropical Medicine in October 2011, to continue his research into a dengue vaccine.



*Dr. Tamaki Okabayashi, the Vice-Director of MOCID, investigates the immune response of the human skin to mosquito bite using an *in-vivo* model that tests mosquito salivary gland extract on human keratinocyte cells.*

DNA VACCINE DEVELOPMENT AGAINST DENGUE

Other than therapeutic antibodies, the BIKEN-Endowed Department of Dengue Vaccine Development is taking another approach to current dengue-related health problems. **Dr. Eiji Konishi**, from Kobe University and Osaka University, decided to relocate his research facilities to the Faculty of Tropical Medicine in October 2011, to continue his research into a dengue vaccine. Although dengue is not a problem endemic to Japan, Dr. Konishi believes that dengue causes the highest burden to public health of any arbovirus. "I feel that as a researcher, it is my responsibility to solve this problem," says Dr. Konishi. For the project, Dr. Konishi collaborates with BIKEN, the largest pharmaceutical company in Japan, and Airlangga University, in Surabaya, Indonesia.

The strategy that Dr. Konishi employs uses genes of the dengue virus to produce non-infectious virus-like particles lacking nucleic acid. Inoculating a patient with these particles would result in an antibody response, which would cause immunity to develop against dengue. Having almost completed setting-up his laboratory in 2011, he hopes that 2012 will involve basic scientific studies to uncover the pathogenesis of dengue.

BASIC-SCIENCE STUDIES OF DENGUE AND CHIKUNGUNYA FEVER

Funded by Osaka University and the Japan Initiative for Global Research Network on Infectious Diseases (J-GRID), the Mahidol-Osaka Center for Infectious Diseases (MOCID) operates under CEAR and delves further into research on dengue and chikungunya fever. In 2011, there were two main ongoing projects.

Currently, MOCID researchers are working to characterize the human monoclonal antibodies against dengue that were developed by Dr. Pongrama's team. Each of the 20 antibody clones is specific to one clone of a dengue virus. According to **Dr. Tamaki Okabayashi**, the Vice-Director of MOCID, not all of these antibodies may be beneficial for neutralizing dengue infection. Some antibodies are known to be *affiliated* with antibody-dependent enhancement (ADE), which actually increases dengue virulence, allowing the virus to infect host macrophages. "ADE is a big wall for therapeutic antibody development. We must identify which clone of the virus induces the production of antibodies that have neutralizing properties and do not increase ADE," says Dr. Okabayashi, "This is key to identifying a candidate for vaccine development."

Dr. Okabayashi arrived from Japan in 2011 to continue his own research here in Thailand, where dengue and chikungunya fever are more prevalent. His project investigates the immune response of the human skin to mosquito bite using an *in-vivo* model that tests mosquito salivary gland extract on human keratinocyte cells. Since it is during this immune response that human macrophages become infected with chikungunya and dengue viruses, understanding this mechanism may be useful to preventing macrophage infection, and thus, the clinical manifestations of these diseases.

EDUCATION AND SERVICES AT CEAR

Currently, CEAR has 12 students, including two international students, participating in projects on dengue, HIV, and TB. In the future, both the BIKEN-Endowed Department of Dengue Vaccine Development and MOCID plan to train more PhD students



of the Faculty. In addition to student education, a number of scientists from JICA routinely come to the Faculty to encourage technology transfers. Special lectures, to which all staff of the Faculty are invited, are frequent.

CEAR also assists the Hospital for Tropical Diseases to diagnose patients with tuberculosis. The Hospital sends approximately 50 samples to CEAR each year.

EARLY-STAGE INVESTIGATOR FEATURE: DR. PANNAMTHIP PITAKSAJJAKUL

Having only earned her PhD in April 2010, **Dr. Pannamthip Pitaksajakul** is already proving she has a bright and busy future in front of her. 2011 saw her with 4 separate projects, funded by the Dean's Research Fund, the Faculty of Tropical Medicine Fund, and JICA. Project topics included the development of an H5N1 Fab human antibody diagnostic kit, using hybridoma-based technology for the production of recombinant IgG antibodies against dengue, and the production of therapeutic antibodies against chikungunya virus (CHIKV), which started in August 2011. Dr. Pannamthip acknowledges that her early success is attributable to her successful and productive collaborations with other CEAR researchers, her persistence, and her ability to attract financial support from JICA and the Faculty. "I just decide what I'm going to do, and finish it," she said.



MAHIDOL VIVAX RESEARCH CENTER (MVRC)



HIGHLIGHTS OF 2011

- The MVRC was set up in March 2011 in the Faculty of Tropical Medicine, with funding from the Bill & Melinda Gates Foundation.
- The MVRC works to develop techniques to easily maintain *in vitro* cultured *Plasmodium vivax*, which is currently not possible.
- The ongoing ICEMR project, funded by the NIH and led by Pennsylvania State University and the 13 other partners in the US, China, Myanmar, and Thailand, to establish the Southeast Asian Center for Malaria Research.
- The MVRC also works to develop a *P. vivax* transmission blocking vaccine.
- In December 2011, a new project grant was awarded to MVRC and CRESIB, by the Bill & Melinda Gates Foundation, to conduct comparative molecular epidemiological studies in Thailand, Papua New Guinea, and Brazil (Trans EPI).





Although the Mahidol Vivax Research Center (MVRC) is one of the newest centers at the Faculty of Tropical Medicine, having only been established less than a year ago, it did not let that fact prevent them from pursuing a highly ambitious research schedule in 2011. However, the Head of MVRC, Dr. Jetsumon Prachumsri, is not a new face to the world of *Plasmodium vivax* research. Her expertise stretches back to a time when most of academia focused their efforts on the more virulent species of *P. falciparum* malaria. Of course, nowadays *P. vivax* research has received a lot of focus (and funding), largely in part to the announcement from the Bill & Melinda Gates Foundation's wish to eradicate malaria from the world. Yet this announcement was made only four years ago and at that time Dr. Jetsumon already had 20 years of experience under her belt, providing the MVRC with a significant advantage over similar research facilities.

Having begun her career at the Armed Forces Research Institute of Medical Sciences (AFRIMS), Dr. Jetsumon worked in the Department of Entomology alongside the U.S. military researchers of the Walter Reed Army Institute of Research (WRAIR). While she had always been interested in malaria, it was at AFRIMS that she developed her niche for vivax malaria. The areas of research were divided in a manner that allowed the U.S. researchers to focus on falciparum malaria, while Dr. Jetsumon and her team tackled vivax malaria. This niche has made her research team indispensable. This reputation has led them to develop a number of collaborations with institutions in the US, Australia, China, Japan, and many other countries. Dr. Jetsumon recognizes the importance of these collaborations. "Malaria research is something no one team can do on their own. No team has the complete skillset to solve these problems. That is why we need to share our expertise."

CREATING A TECHNIQUE FOR CULTURING *P. VIVAX*

2011 saw the continuation of a few different projects of the MVRC. Currently, research on *Plasmodium vivax* has a major obstacle: unlike other types of malaria parasites, there is no established effective method of culturing *P. vivax in vitro*. "Researchers must get samples directly from patients with vivax malaria, because it is difficult to maintain in the lab," says Dr. Jetsumon. "This makes Thailand an ideal place to do vivax research." Malaria transmission is low and seasonal in Thailand but here, 50% of all malaria cases are caused by *P. vivax*. Taking advantage of the constant access to malaria patients, Dr. Jetsumon and her team has been tackling the obstacle of *P. vivax* laboratory cultures, trying to develop a technique that will allow researchers around the world to grow and experiment on the parasites.



"Malaria research is something no one team can do on their own. No team has the complete skillset to solve these problems. That is why we need to share our expertise."



This collaborative project, funded by the Bill & Melinda Gates Foundation and led by the University of South Florida (USF), also includes Walter and Eliza Hall Institute of Medical Research (WEHI) from Australia and Nagasaki University from Japan. Each team is trying a different approach to solving the culturing problem. “*Plasmodium vivax* will only infect very young red blood cells, which is why we can’t keep it in culture yet,” explains Dr. Jetsumon. To address this, the WEHI team is utilizing stem cell technology to generate young red blood cells, the Nagasaki University team is using genetic modification to change this attribute of the parasite, and USF attempts to maintain small-scale cultures of the *P. vivax* parasite. Meanwhile, the MVRC is developing methods to optimize both the culturing environment and find a naturally-occurring isolate that will be able to persist in the laboratory setting.

THE SOUTHEAST ASIAN MALARIA RESEARCH CENTER (ICEMR)

As part of the NIH-funded International Centers of Excellence in Malaria Research (ICEMR) mechanism, the MVRC is one of 15 partners coordinating the Southeast Asian Malaria Research Center, which is led by Pennsylvania State University. This large 7-year project requires the collection of more accurate immunological and epidemiological data to determine the mechanism of malaria transmission. Dr. Jetsumon, as the Project Leader of one branch of the ICEMR, coordinates the compilation of ecological and molecular epidemiology data from China, Myanmar, and her own field site in Kanchanaburi, Thailand.

DEVELOPING A *P. VIVAX* TRANSMISSION-BLOCKING VACCINE

Although there are currently many different approaches to developing therapeutics and vaccines against malaria, Dr. Jetsumon and her team believe pursuing a “transmission-blocking” vaccine may be the most efficient method. Transmission-blocking means that the parasite will be neutralized while in the mosquito vector, and not in the human. While this will not prevent people from getting sick, administering this kind of vaccine would prevent an infected person from transmitting it to other people. In the long-term, if *P. vivax* transmission was continuously blocked, the incidence of new cases would rapidly decline.

This type of cutting-edge research is unique only to the MVRC. “We are the only lab in the world doing this,” say Dr. Jetsumon. That is because the development of the vaccine requires constant access to patient blood samples. However, once a promising candidate vaccine is developed, evaluating the efficacy of a transmission-blocking vaccine is actually easier than more traditional ones. The efficacy can be measured using only patient blood samples and mosquitoes, which eliminates much of the red tape that typically delays clinical evaluations of other vaccines.

EDUCATION AND TECHNOLOGY TRANSFER IN THE MVRC

In 2011, the MVRC began to assist with the training of students from various parts of Mahidol University. The training included 1 PhD student and 1 MSc student from the Department of Entomology at TropMed, 1 PhD student from the Department of Microbiology at the Faculty of Science, and even 1 undergraduate student from Mahidol University International College. In addition to just domestic students, Dr. Jetsumon regularly coordinated training sessions for students



and scientists from the United States to visit her field site in Kanchanaburi and learn what she does. She trained them on research techniques, such as parasite culturing, and human use protocols.

Dr. Jetsumon prides herself on letting each of these students and trainees take part in her real research projects, rather than a “mock-research” project, in order to provide them with more meaningful experience.

LOOKING AHEAD

2012 is looking like it is going to be a busy year for the MVRC. Having just received news of successful funding for a new project in December 2011, the MVRC will begin the new project, which is a collaboration led by the Barcelona Centre for International Health Research (CRESIB) and funded by the Bill & Melinda Gates Foundation. This project plans to investigate the interaction of malaria gametocytes inside of the mosquito vector and how this contributes to the disease transmission. In addition to looking at this in Thailand, the study will also take place in Papua New Guinea and Brazil.

The MVRC has also set a few more goals for 2012. They hope to find at least one isolate of *P. vivax* capable of persisting in *in vitro* cultures. They are also becoming increasingly interested in using humanized mouse models to study the pathogenesis of *P. vivax* in detail. One of the most significant traits of vivax malaria is that even after a patient receives treatment and becomes “cured,” the malaria parasite can remain dormant in the human liver and resurface later. Recent technology, which involves implanting human liver cells into mice, may be a promising method to shed light on the mechanisms that make this possible.

Finally, the MVRC hopes to expand its capacity for training by seeking funding to develop a regular training and technology exchange curriculum, which will involve a partnership between Mahidol University and US universities.





BANGKOK SCHOOL OF TROPICAL MEDICINE

The **Bangkok School of Tropical Medicine** is one of only 8 schools in the world that offers students a degree in tropical medicine and is accredited by the **American Society for Tropical Medicine and Hygiene** and the **International Society of Travel Medicine**. In 2011, it continued to offer 6 world-class English-language postgraduate programs:

1. Diploma in Tropical Medicine and Hygiene (DTM&H)
2. Master of Clinical Tropical Medicine (MCTM)
3. Master of Clinical Tropical Medicine in Tropical Pediatrics (MCTM [TP])
4. Master of Science in Tropical Medicine (MSc [Trop Med])
5. Doctor of Philosophy in Tropical Medicine (PhD [Trop Med])
6. Doctor of Philosophy in Clinical Tropical Medicine (PhD [Clin Trop Med])

In the past year, course participants have included general clinicians, heart and neurosurgeons, researchers, and other medical staff from Thailand and 14 other countries around the world. The diverse community of students included members from Europe (the United Kingdom, Germany, Norway, Switzerland), Africa (Uganda and Somalia), South and Southeast Asia (Nepal, Myanmar, Philippines, Singapore, India) and East Asia (Korea and Japan). Within Thailand, students came from several provinces to study and live in Bangkok. Outreach programs actively recruit students from Mahidol University and other universities, such as Burapha, Srinakharinwirot, Rangsit, Huachiew Chalermprakiat, and Kasetsart.

Students have the unique opportunity to study tropical diseases in endemic areas; this is a key factor in making studying at the School an inimitable experience. "The educational experience at the school is hands-on," says **Deputy Dean for Education, Dr. Waranya Wongwit**. "In other graduate programs, students learn about malaria in the classroom, and from textbooks. But because we are in Thailand, students can leave the classroom and learn from witnessing a clinical case of malaria in the **Hospital for Tropical Diseases**, or by studying real specimens of malaria parasites obtained from the field, in our laboratories."



"In other graduate programs, students learn about malaria in the classroom, and from textbooks. But because we are in Thailand, students can leave the classroom and learn from witnessing a clinical case of malaria in the Hospital for Tropical Diseases, or by studying real specimens of malaria parasites obtained from the field, in our laboratories."

"This wonderful learning experience not only exposes students to a culturally unique environment, but also helps establish professional relationships that will develop into a collaborative network in students' future careers," says **Deputy Dean for Student Affairs, Dr. Chotechuang Panasoponkul**.

Alumni of the School have taken their degrees and applied them to developing a variety of successful careers. Some return to their home countries and work in hospitals, using their newfound expertise in bedside manner and treatment of tropical diseases, to become experts in travel medicine or parasitic diseases. Others have gone on to be field officers with NGOs like Medecins sans Frontieres, or in regional Government Departments responsible for disease surveillance. Others have progressed to work in nursing colleges or universities, where they conduct basic and advanced biomedical research.

EARNING RECOGNITION FROM THE OFFICE OF THE HIGHER EDUCATION COMMISSION

The School constantly strives to enhance its reputation for excellence. In 2011, Dr. Waranya saw that opportunity when the **Office of the Higher Education Commission (OHEC)** announced the second annual **"Best Practice Project."** Through this initiative, Dr. Waranya submitted the DTM&H program to the International Program contest. The DTM&H program has always been one of the most appealing programs for international students, especially for medical doctors, since the duration is only 6 months, allowing them to develop higher-level skills without being away from the workplaces and families for extended periods. "Medical doctors who want to learn a different aspect of medicine and want to gain a specialty or focus of expertise in infectious diseases often enroll in the DTM&H program," says Dr. Waranya. "It gives them a chance to obtain valuable knowledge in the clinical treatment of tropical diseases, which they can then take back to their home countries."

The "Best Practice Project" initiative emphasizes innovation, international cooperation and networking, sustainability, and a commitment to continuous improvement. The DTM&H program at the School was named the "Best Practice Project" for 2011, which is a testament to the School's dedication to excellence.



"Students are able to call me all hours of the day and night, asking me for advice and assistance with problems. I do everything I can to help them."





REFINING CURRICULA TO MEET NATIONAL STANDARDS

“ The DTM&H program at the School was named the “Best Practice Project” for 2011, which is a testament to the School’s dedication to excellence. ”

The OHEC has also played a primary role in reshaping the School’s 6 curricula. In 2009, OHEC announced the Thai Qualifications Framework for Higher Education (TQF: HEd). All educational programs developed within TQF are meant to promote knowledge and professional expertise normally associated with studies leading to comparable awards throughout the world, but should also include particular emphases reflecting the policy priorities of Thailand.

TQF-accredited programs emphasize interpersonal skills and responsibility, analytical and communication skills, ethical and moral development, knowledge, and cognitive skills. “We did not have much restructuring to do, in fact,” says Dr. Waranya. “However, we had to compare our program with the TQF requirements and see how we could fit it into the Framework. As the educational standards of OHEC become increasingly high, the School must adapt to comply with the standard. That is how our School and our graduates will stay competitive and successful in Thailand and abroad.”



ENSURING THE WELL-BEING OF OUR STUDENTS

The Deputy Dean for Student Affairs, Dr. Chotechuang Panasoponkul is on call 24/7. “Students are able to call me all hours of the day and night asking me for advice, or in the event of a problem. I do everything I can to help them. My philosophy is that



students need to be happy and comfortable living in Bangkok in order to be successful in their studies." Dr. Chotechuang and the School organized numerous events throughout 2011, to orient students to Bangkok and promote unity within the School.

Starting in April 2011, on the opening day of the DTM&H program, the School began the task of welcoming students by organizing Orientation Day. "Orientation is a time when I can tell them all about the Thai lifestyle," explains Dr. Chotechuang. "I teach them about all the cultural differences, like what you should and should not do." Following Orientation, the School made arrangements for the overnight Welcome Trip, which involves a night of fun and karaoke at the Faculty's campus in Kanchanaburi.

Other events include Freshie Day, which coincides with the opening day of the MSc and PhD programs and is a networking event for students to meet each other; Wai Kru Day, the traditional Thai holiday where gratitude and respect is paid to teachers and professors; and Sports Month, a month-long series of games including volleyball, tennis, Jenga, badminton, table tennis, and many more. Dr. Chotechuang also teaches a free Thai language class for the international students, to assist with their adjustment to living in Thailand.

The events of the School foster a "Trop Med family" of sorts, which was no more apparent than during the flooding that struck Bangkok, in late 2011. Staff of the School worked tirelessly to ensure that all students were informed and safe, allowing some students to stay in the International Student House at no cost. But it was not only current staff and students who banded together in the face of the disaster. "I had numerous emails and phone calls every day from alumni asking how they could help," says Dr. Chotechuang.

LOOKING FORWARD

There are already plans in place for a new 9-floor building for the school. "We want to build an education center where the entire Bangkok School of Tropical Medicine can be," says Dr. Waranya. "Currently, individual classes are taught in their respective departments. But we feel it is important for School unity to have them all under one roof."

In addition, the School is restructuring its scholarship program, to award more funds to domestic students. This new scholarship will require staff members of the Faculty to nominate an outstanding student for the award. They plan to award 6 such scholarships, which will include both tuition and a living stipend.



OFFICE OF THE DEAN



Assist. Prof. Kasinee Buchachart
Secretary of the Faculty

The Office of the Dean is a support unit facilitating the administrative tasks of the Faculty: it comprises the Administration and General Affairs, Unit, Human Resource Unit, Financial and Procurement Units, Educational Technology Unit, Information Technology Unit, Asset Management Unit, and Legal and Property Units.

HUMAN RESOURCE UNIT



Ms. Sukanya Klinseubchue
BA
Head
Until 30 Sept 2011

HUMAN RESOURCE UNIT



Ms. Phongsri Konthong
BA
Head
Start on 1 Oct. 2011

ADMINISTRATION & GENERAL AFFAIRS UNIT



Ms. Thitika Teeranetr
BA, MA
Head

PROCUREMENT UNIT



Mrs. Prapaiporn Tiacharoen
Cert, BBA
Head

FINANCIAL UNIT



Mrs. Thanomsri Ketsuk
BBA
Head

INFORMATION TECHNOLOGY UNIT



Ms. Duangjai Sahassananda
BSc, MSc
Head

EDUCATIONAL TECHNOLOGY UNIT



Ms. Siwaporn Phanphoowong
MEd
Head

ASSET MANAGEMENT UNIT



Mr. Savek Chomming
Dip in Voc, BS Tech Ed
Head

LEGAL AND PROPERTY UNIT



Mr. Kittisak Pooawad
LLM
Head

THE OFFICE OF STRATEGIC PLANNING AND POLICY



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Ms. Paweena Sitthisohta
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RISK MANAGEMENT AND INTERNAL AUDIT

OFFICE ACTIVITIES

Planning and Policy Development

- To write all administrative strategies of the Faculty.
- To monitor, report, and carry out institutional research.
- To write the HR manpower plan.
- To analyze the Faculty structure, in terms of establishment and collaboration efforts.
- To coordinate and negotiate business-related budgets and host international academic meetings.
- To execute the project of Routine to Research (R to I)
- To coordinate the seminar for organization development.

Budgeting and Finance

- Governmental support budget
 - To write the annual expense proposal and 4-year investment plan.
 - To write the budget action plan.
 - To analyze income and expense by category.
- Faculty income budget
 - To form the estimated income budget of the Faculty.
 - To write the annual expense proposal (Faculty income) and mid-year supplementary budget.

General Administration

- To send and receive office documents.
- To record and file office documents.
- To provide all executive data and statistics of the Faculty.
- To report the Faculty utility costs according to cabinet's resolution for resources.

Quality Assurance

- To write the Self-Assessment Report (SAR) of the Faculty in accordance with quality standards.
- To coordinate Faculty surveys.
- To facilitate recoding/monitoring data of the Mahidol University Faculty Information System (FIS).

Risk Management and Internal Audit

- Risk Management
 - To monitor the internal checks and balances system.
 - To estimate and report on risk levels of Faculty administration.
 - To write risk control plans.
- Internal Checks and Balances
 - To re-check the Faculty's budget and monetary affairs.
 - To consult with a professional internal checker.

THE OFFICE OF EDUCATIONAL ADMINISTRATION



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EDUCATIONAL SERVICES

Documents and General Administration



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Corporate Communication



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Teaching and Learning Coordination



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Registration and Teaching-Learning Evaluation



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Educational Quality Development



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The Office of Educational Administration (OEA) works to coordinate all of the different educational curriculums that the Faculty of Tropical Medicine offers. Our duties are broken down into 8 general categories:

Documents and General Administration: We manage all documents and registration forms, as well as perform general tasks such as producing handouts and photocopies. We also facilitate communication, both within our office and between other offices. Finally, we organize the opening and closing ceremonies for all courses.

Finance and Procurement: In terms of financial matters, the OEA is responsible for making each yearly financial plan as well as corresponding with our various fundraisers. We handle all accounting, reporting invoices and receipts and inventory maintenance.

Corporate Communication: We are in charge of making the School Public Relations plan, in order to handle all communication between the School and the general public. We handle all e-mail correspondence regarding international program information and advice to prospective students and update the school website's information. We also manage application submissions and verify enrollment of foreign applicants, as well as coordinate such events as our open house and road shows.

Teaching and Learning Coordination: The OEA not only manages student course registration, we also coordinate all teaching and classroom timetables. We handle payment dispersal for all internal and external lecturers. The OEA organizes special events, such as guest lecturer and student academic forums. We also produce the Student Manual.

Registration and Teaching-Learning Evaluation: We manage all student records as well as maintain a comprehensive school student database, which includes both current students and alumni. As we strive to provide a high-quality education at TropMed, some of our most important tasks is facilitating the teacher evaluations and course evaluation, organizing and assisting with the development of student research projects, and manage on ongoing projects.

Laboratory and Audio-visual Media: The OEA coordinates all management and maintenance for laboratory facilities and equipment used as tools for teaching and training

Educational Quality Development: We organize all Education Assessment Reports and exam paper collection. We also identify and reporting any educational risk factors that may prohibit our students from accessing a proper education. We also organizing laboratory field trips and ensure they are in accordance with the TropMed educational standards.

Student's activity and Student's service: To assist our students and add enjoyment to their experience studying in Bangkok, we develop and implement an action plan for various student activities. We assist with the coordination of all student events, such as community service projects, "Freshy" Day, the Welcome field trip, MU International Day, and various sporting events. The OEA organizes cultural ceremonies, like Wai Khru Day, and other ceremonies, like convocation. We document all of these events by taking photos. We also make the Tropmed International Student Guide, and assist international students by escorting them to health service centers, providing visa assistance, and providing information about funding sources to students.

STUDENT'S ACTIVITY AND DEVELOPMENT

Student's Activity




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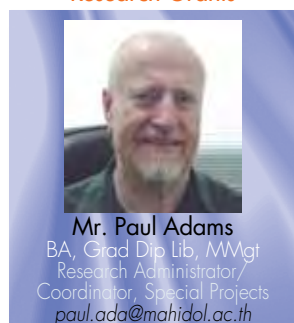


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RESEARCH ADMINISTRATION

International Sponsored
Research Grants

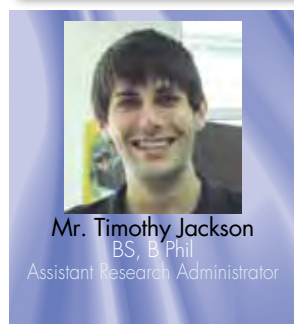
Domestic Sponsored
Research Grants



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Mr. Sumeth Suebrakul
BSc
Information Resource Analyst
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Mr. Timothy Jackson
BS, B Phil
Assistant Research Administrator



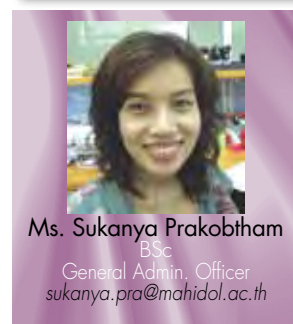
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Mr. Brian Williamson
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Assistant Research Administrator



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ETHICS COMMITTEE SECRETARIAT

The Office of Research Services (ORS) coordinates and supports the research activities of the Faculty of Tropical Medicine (TropMed), to achieve excellence in research and to retain its position as a leading research institution in Tropical Medicine. The ORS is the central coordinator of all TropMed's sponsored research activities. We provide guidance and support to staff developing, submitting, and managing research grants, as well as play several other roles related to research and facilitating information exchange.

Research Administration

ORS staff members assist with the administration of both international and domestic grants, acting as liaison between TropMed researchers, other researchers, government and non-government agencies, and funding agencies. Currently, as part of its extensive pre-award services, the ORS identifies and notifies TropMed staff of new funding opportunities and helps researchers develop grant applications

and submission in print or online. We manage the full range of post-award financial and progress reporting and auditing, ensuring that each document promptly and accurately meets funding agencies' specifications and requirements. Finally, we provide guidance to new researchers or researchers who are unsure of how to obtain international funding.

We also coordinate application review and fund dispersal of internal TropMed funds, such as the **Faculty of Tropical Medicine Research Fund** and the newly established **Dean's Research Fund**. The Dean's Research Fund was established in 2011 to help fund researchers within TropMed, both new inexperienced researchers and others that looking for a springboard to international funding opportunities. As the Secretariat for this Committee, the ORS has been working to establish proposal evaluation standards, budgeting formats, and post-award management strategies. For the first cycle, 11 applications were reviewed and 6 were awarded.

Additionally, the members of the Research Administration Unit that manage international grants, including progress reporting, preparing accounting or expenditure reports, managing communication with the foreign funding institute and other general administrative duties. The ORS also provides English editorial assistance, for the thesis abstracts of graduate students, manuscripts and publications of staff members, and all grant applications.

Publication Database and IT Management

Staff members of the ORS maintain the TropMed publication database of over 40 years of publications. We handle all computer programming and software installation within the ORS, and assist with general computer upkeep. We also handle all IT matters related

to programming the TropMed research website, including publishing research-related updates and events in the current news section. The IT Management staff also assist with setting up videoconference meetings between TropMed researchers and our many international collaborators.

Conference and Event Planning

The ORS handles all of the logistical and administrative matters concerning research conferences held by TropMed. We are responsible for planning and hosting the annual **Joint International Tropical Medicine Meeting (JITMM)** and the **Food- and Water-Borne Zoonoses (FBPZ)** conference every three years. We facilitate all communication between TropMed and conference participants,

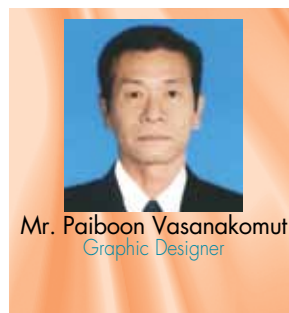
PUBLICATION DATABASE AND IT MANAGEMENT



PUBLICATIONS AND GRAPHIC DESIGN



CONFERENCE AND EVENT PLANNING



including invitations, registration, accommodation booking, airport pick-up, and surveys and comments. We also plan each conference schedule, book keynote speakers and entertainment, and establish the venue. In addition to the ORS' regular conferences, we also assist with the organization of other conferences for which TropMed is chosen to be the host. In 2011, the **AIDS Vaccine Conference** was organized by TropMed.

The ORS manages the planning and coordinating of researcher training workshops and other special events. Since knowledge and practices in tropical medicine are changing and becoming more advanced every day, we feel it is crucial to keep our researchers up-to-date as well as open the fields of communication between TropMed staff and international researchers. In order to do this, we frequently organize "Lunch Talks" and other special talks, where we invite both TropMed staff and outside researchers to discuss important topics and developments in tropical medicine.

Ethics Committee

The TropMed Ethics Committee (EC) is also located within the ORS. The EC, which has been internationally accredited by SIDCER/ FERCAP, is responsible for reviewing all of TropMed's research projects, to ensure their adherence to internationally accepted ethical standards. The EC meets regularly to discuss and review research proposals on clinical trials and other scientific research that involves human or animal subjects. After the initial consideration of a proposal, the EC offers suggestions how to revise a project to make it ethically sound.

Publications and Graphic Design

Graphic design specialists within the ORS handle most of the communication materials produced by the ORS and TropMed. This includes all conference advertisements and signage, all special-event notifications, and other marketing materials. We also oversee the design and layout of the website on TropMed research and the production of ORS publications, such as this Annual Review.

THE OFFICE OF INTERNATIONAL COOPERATION (OIC)



INTERNATIONAL COOPERATION AND PUBLIC RELATIONS MOU/AGREEMENT



LOCAL INTERNATIONAL CENTERS AND SHORT TRAINING PROGRAMS



The Office of International Cooperation (OIC), Faculty of Tropical Medicine promotes, facilitates and strengthens international collaborative activity relating to medical science. International collaboration is a major contributing academic strength of the Faculty of Tropical Medicine. In 2011, the OIC helped facilitate the honorary appointments of 3 Visiting Professors from Europe: Dr. Adrianus Dondorp (England), Dr. Jean Pierre Dujardin (Belgium), and Prof. Nicholas John Day (England). The average yearly number of new international visitors is 70-100 from more than 20 leading institutes worldwide.

The OIC started regular short and special requested extended training courses in 2003. Since then, the number of courses and participants has been increasing. In 2009, there were 17 training courses with 212 participants. In 2011, there were 19 training courses with 302 participants. Other inter-organizational collaborations facilitated by the OIC include consulting services, personnel exchanges, specimen and information exchanges, joint training courses, workshops, seminars and conferences.

RESEARCH IN PROGRESS

(1 OCTOBER 2010 - 30 SEPTEMBER 2011)

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF CLINICAL TROPICAL MEDICINE			
1 ***	A Phase III Trial of Aventis Pasteur Live Recombinant ALVAC-HIV (vCP1521) Priming with VaxGen gp120 B/E (AIDSVAX B/E) Boosting in HIV-uninfected Thai Adults (Clinic)	The Henry M. Jackson Foundation for The Advancement of Military Medicine, Inc. and The Government of Thailand Ministry of Public Health	Prof. Punnee Pitisuttithum
2 ***	A worldwide, phase I, dose-escalating study of the safety, tolerability, and immunogenicity of a three-dose regimen of MRKAd5HIV-1 gag vaccine in healthy adults	Merck & Co., Inc	Prof. Punnee Pitisuttithum
3 ***	Measurement of anogenital wart burden, and cost of illnesses in Bangkok	Merck Research Foundation	Prof. Punnee Pitisuttithum
4 ***	The Research Project for Technology Transfer of Chronic Lymphede Treatment Targeting at Medical, Public Health, and Community Personnel in Thailand Southern Border Regions	Government Budget	Dr. Wichai Ekataksin
5 ***	Comparison of the safety and efficacy of a Unique Intravenous Iron Preparation (VIT-45) versus oral iron in the treatment of Anemia in non-dialysis dependent chronic kidney diseases	Luitpold Pharmaceutical, Inc, USA	Assoc. Prof. Yupaporn Wattanagoon
6 ***	Bioequivalence study of generic Glimepiride tablets to innovator Amary® (Glimepiride 2 mg) in healthy Thai volunteers	International Bio Service Co., Ltd	Assoc. Prof. Yupaporn Wattanagoon
7 ***	Pharmacologic study of Oseltamivir in healthy volunteers	National Institutes of Health, USA	Assoc. Prof. Yupaporn Wattanagoon
8 ***	Effect of primaquine and its metabolite on the infectivity of <i>P. falciparum</i> gametocyte	Wellcome Trust of Great Britain	Asst. Prof. Kesinee Chotivanich
9 ***	Bioequivalence study of 4 mg Perindopril tablets preparations in healthy Thai male volunteers	International Bio Service Co., Ltd	Asst. Prof. Weerapong Phumratanapapin
10 ***	Evaluation of genetic susceptibility to melioidosis	The US National Institute of Health	Dr. Wirongrong Chierakul
11 ***	Abnormalities of coagulation and the immune response in diabetic patients with melioidosis	MORU, the Faculty of Tropical Medicine and Amsterdam Medical Centre, Netherlands	Dr. Wirongrong Chierakul
12 ***	<i>In Vivo</i> bioequivalence study of 160 mg Fenofibrate film-coated tablet preparation in healthy Thai male volunteers	International Bio Service Co., Ltd	Asst. Prof. Weerapong Phumratanapapin
13 ***	Rabies exposure risk among foreign backpackers from non-ASEAN countries traveling in Southeast Asia	Department of Clinical Tropical Medicine and Travel Medicine Unit	Dr. Watcharapong Piyaphanee
14 **	A phaseIV, multi-center, randomized, double blind, placebo controlled study to evaluate the safety of daily inhaled Zanamivir 10 mg versus placebo and daily oral Oseltamivir 75 mg versus placebo for influenza prophylaxis in healthy volunteers for 16 weeks	SEA Influenza Clinical Research Network	Prof. Sasithon Phukrittayakamee
15 ***	VNTR-based PCR (VNTR) Typing for <i>Plasmodium falciparum</i> and <i>Plasmodium vivax</i>	Biotech	Asst. Prof. Mallika Imwong
16 ***	Molecular characterization of drug resistance in the Human malaras	Intermediate level fellowship, Wellcome Trust of Great Britain	Asst. Prof. Mallika Imwong

* New Project ** Finished Project *** Ongoing Project

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF CLINICAL TROPICAL MEDICINE (Continued)			
17 ***	Pathology of mouse vital organs after injection with Artemisinin derivatives	Mahidol-Oxford Tropical Medicine Research Unit	Asst. Prof. Apichart Nontprasert
18 ***	Rapid diagnosis of leptospirosis by loop-mediated isothermal amplification	The Thailand Research Fund	Dr. Piengchan Sonthayanon
19 ***	Safety and efficacy study of Impomea pes-caprae ointment produced by Faculty of Tropical Medicine	Faculty of Tropical Medicine, Mahidol University	Dr. Watcharapong Piyaphanee
20 ***	Development of PCR-based detection for <i>Leptospira</i> spp. And <i>Orientia tsutsugamushi</i> in patients with coinfection of leptospirosis and scrub typhus	Faculty of Tropical Medicine, Mahidol University	Dr. Piengchan Sonthayanon
21 ***	A Randomized, international, Double-Blinded (With In-House Blinding), Controlled With GARDASILTM, Dose-Ranging, Tolerability, Immunogenicity, and Efficacy Study of a Multivalent Human Papillomavirus (HPV) L1 Virus-Like Particle (VLP) Vaccine Administered to 16 to 26 Year Old Women	MSD (Thailand)	Prof. Punnee Pitisuttithum
22 ***	Travelers' diarrhea among foreign travelers in Southeast Asia based on surveillance data at Suvarnabhumi Airport	Faculty of Tropical Medicine, Mahidol University	Dr. Chatporn Kittittrakul
23 ***	Detection of artemisinin resistance <i>P. falciparum</i> : <i>in vitro</i>	Mahidol-Oxford Tropical Medicine Research Unit	Assoc. Prof. Kesinee Chotivanich
24 ***	A Phase III Clinical Trial to Study the Immunogenicity, Tolerability, and Manufacturing Consistency of V503 (A multivalent Human Papillomavirus [HPV] L1 Virus-Like Particle [VLP] Vaccine) in Preadolescents and Adolescents (9 to 15 year olds) with a Comparison to Young Woman (6 to 26 year olds)	Merck & Co., Inc	Prof. Punnee Pitisuttithum
25 ***	Safety, Immunogenicity and Efficacy Studies of WRSS1, a Live Attenuated <i>Shigella sonnei</i> Vaccine Candidate, in Healthy Thai Adults	Merck & Co., Inc	Prof. Punnee Pitisuttithum
26 **	New and Simple method in diagnosis of malaria		Prof. Polrat Wilairatana
27 *	Novel invention of induced pluripotent stem cells for prediction of drug toxicity in human	Government Budget	Asst. Prof. Apichart Nontprasert
28 *	The efficacy of Moisturizing Lotion with Lichochoalcone in treatment of Dryskin and Pmritus in End-Stage renal disease patients	Department of Clinical Tropical Medicine, Faculty of Tropical Medicine	Dr. Vorada Choovichian
29 *	Incidence and spectrum of health problems among travels to Lao PDR	Department of Clinical Tropical Medicine and Travel Medicine Unit	Dr. Watcharapong Piyaphanee
30 *	The efficacy of antimalarial treatment for <i>Plasmodium vivax</i> at Thai -Cambodia border, Thailand.	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Dr. Prakaykaew Charunwatthana
DEPARTMENT OF HELMINTHOLOGY			
1 ***	Study on <i>Paragonimus</i> population: morphology, molecular biology, enzymology and epidemiology aspects	Ministry of Foreign Affairs	Assoc. Prof. Jitra Waikagul
2 ***	Genetic variation and population structure studies of fish-borne trematodes for increasing control impact of opisthorchiasis and cholangiocarcinoma	The Thailand Research Fund	Assoc. Prof. Jitra Waikagul
3 ***	The study on life cycle and antigenicity of <i>Paragonimus pseudoheterotremus</i> waikagul, 2007	Faculty of Tropical Medicine, Mahidol University	Mrs. Tippayarat Yoonuan

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF HELMINTHOLOGY (Continued)			
4 ***	<i>Angiostrongylus cantonensis</i> in freshwater snails collected from 18 different localities of Thailand: prevalence and parasitic burden, biochemical components, antigenicity and population genetics	Government Budget	Assoc. Prof. Chalit Komalamisra
5 ***	Study on the recombinant proteins expressed from Mucin-1 gene of <i>Toxocara canis</i> in Prokaryotic and Eukaryotic cells for diagnosis of human toxocariasis	Faculty of Tropical Medicine, Mahidol University	Dr. Dorn Watthanakulpanich
6 ***	Genetic variation and DNA sequences of <i>Taenia asiatica</i>	Faculty of Tropical Medicine, Mahidol University	Assoc. Prof. Malinee Thairungroj
7 **	Functional studies of protease from <i>Angiostrongylus cantonensis</i> in activation of metric metalloprotease	Mahidol University	Dr. Poom Adisakwattana
8 ***	Analysis of an electro-eluted antigen (< 30 kDa) of <i>Strongyloides stercoralis</i> infective larvae using IgG1-4 – ELISA for diagnosis of strongyloidiasis	Faculty of Tropical Medicine, Mahidol University	Mr. Wallop Pakdee
9 ***	Health status of immigrant children and environmental survey of the children day care centre in Samutsakorn province	Faculty of Tropical Medicine, Mahidol University	Mr. Surapol Sa-nguankiat
10 *	Identification and characterization of <i>Trichinella spiralis</i> -derived immunomodulatory molecules for novel therapies of inflammatory diseases	Faculty of Tropical Medicine, Mahidol University	Dr. Poom Adisakwattana
11 *	Experimental Co-infection study of high virulence pathogenic <i>Leptospira</i> in Helminth infected Hamster	Faculty of Tropical Medicine, Mahidol University	Mr. Kittipong Chaisiri
12 *	Development of effective immunodiagnosis for detection gnathostomiasis by using recombinant cathepsin L.	Faculty of Tropical Medicine, Mahidol University	Mrs. Supaporn Nuamtanong
13 *	Proteomics studies of cytoplasmic membrane proteins expressed on TNF- α induced cholangiocarcinoma cell line	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Poom Adisakwattana
14 *	Development of technique of discriminating species and estimating numbers of metacercariae of fish-borne trematodes in an area of mixed infection between Opisthorchiid liver flukes and Heterophyid intestinal flukes by using multiplex real-time PCR	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Urusa Thaenkham
15 *	Production of recombinant Cathepsin L from <i>Paragonimus pseudoheterotremus</i> for diagnostic development of paragonimiasis	The Thailand Research Fund and Mahidol University	Dr. Tippayarat Yoonuan
16 *	Separation of <i>Toxocara</i> excretory-secretory antigens as a diagnostic antigens for human toxocariasis	National Science and Technology Development Agency	Dr. Dorn Watthanakulpanich
DEPARTMENT OF MEDICAL ENTOMOLOGY			
1 **	Dynamic and temporal structure of the troglobitic fauna of medically important insects and arthropods in caves of Kanchanaburi Province	Faculty of Tropical Medicine, Mahidol University	Assoc. Prof. Chamnarn Apiwathnasorn
2 **	Technology transfer of research and development for essential oils of <i>Lisea cubeba</i> , Qinghao (<i>Artemisia annua</i>) and kaffir lime (<i>Citrus hystrix</i>) as mosquito repellents for control of mosquito-borne diseases to local communities of northern, southern and northeastern Thailand	Government Budget	Assoc. Prof. Chamnarn Apiwathnasorn
3 **	Population dynamic of the dengue vectors and dengue virus infection in <i>Aedes aegypti</i> and <i>Aedes albopictus</i> , in urban and suburban areas	Government Budget	Assoc. Prof. Narumon Komalamisra

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF MEDICAL ENTOMOLOGY (Continued)			
4 ***	Molecular identification of <i>Anopheles sundaicus</i> in natural breeding sources, the coastal area of Andaman and the Gulf of Thailand	Faculty of Tropical Medicine, Mahidol University	Dr. Jiraporn Ruangsittichai
5 ***	Feeding behavior, ecological studies, and molecular identification of <i>Anopheles dirus</i> complex in man-habitat	Faculty of Tropical Medicine, Mahidol University	Dr. Sungsit Sungwornyothin
6 ***	Classification of medical arthropod vectors in Thailand by DNA barcode	Government Budget	Dr. Jiraporn Ruangsittichai
7 ***	Study of genetic variation for identification of mosquitoes in Thailand by molecular techniques	The Thailand Research Fund	Dr. Jiraporn Ruangsittichai
8 ***	DNA barcoding of medically entomological ectoparasites	Government Budget	Dr. Sungsit Sungwornyothin
9 ***	Tropic behavior and ecological characteristics of <i>Anopheles dirus</i> complex in man-made habitat	The Thailand Research Fund	Dr. Sungsit Sungwornyothin
10 ***	Study on larvicidal activity of <i>Azadirachta indica</i> Extracts and formulate as a product for the control <i>Aedes aegypti</i> mosquito larvae	Faculty of Tropical Medicine, Mahidol University	Mr. Samrerng Prummongkol
11 ***	Comparative linoleic, calcium and protein in sesame oil and sesame meal by using hydraulic press and cultural press machine	Faculty of Tropical Medicine, Mahidol University	Mrs. Keawmala Palakul
12 *	DNA barcode: the technical challenge for <i>Anopheles</i> mosquito blood meal identification to reverse host from laboratory model versus field.	Faculty of Tropical Medicine, Mahidol University	Dr. Patchara Srivichai
13 *	Climate changes effects on mosquito-borne viruses maintenance : Dynamic population of the Vectors of Dengue and Chikungunya viruses	Faculty of Tropical Medicine, Mahidol University	Dr. Ronald Enrique Morales Vargas
14 *	Effect of temperature on development and insecticide susceptibility of dengue vectors.	Faculty of Tropical Medicine, Mahidol University	Assoc. Prof. Narumon Komalamisra
15 *	Comparison and evaluation of Loop-mediated isothermal amplification (LAMP) and RT-PCR as diagnostic tool for dengue virus detection in <i>Aedes</i> among epidemic area	Faculty of Tropical Medicine, Mahidol University	Dr. Rawewan Srisawat
16 *	Application of morphometrics and molecular biology to identify <i>Ae. scutellaris</i> in Thailand	Faculty of Tropical Medicine, Mahidol University	Dr. Suchada Samruaypol
17 *	Quantitative transovarial transmission to dengue-2 virus in both sexes of dark- and pale-form <i>Ae. Aegypti</i>	Faculty of Tropical Medicine, Mahidol University	Mr. Teerawit Panpoowong
18 *	Proteomic profile associated with pyrethroid resistance in <i>Aedes aegypti</i>	The Thailand Research Fund and Mahidol University	Dr. Rawewan Srisawat
19 *	The effects of different temperatures on the interaction between <i>Aedes</i> Mosquitoes and Dengue Virus especially Viral Susceptibility, Dissemination, Transmission and Disease Pathogenesis.	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Assoc. Prof. Supratra Thongrungrat
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY			
1 ***	Role of NK cells, NKT cells and T cell subpopulations through granule exocytosis in response to <i>M. tuberculosis</i> infection	The Thailand Research Fund	Prof. Srisin Khusmith
2 ***	Clinical and immunological study on difficulty treatment TB in Chiang Rai, Thailand	Japan Health Science Foundation	Prof. Srisin Khusmith
3 *	Genetic polymorphisms in HIV infected patients receiving antiretroviral therapy	The Thailand Research Fund	Prof. Srisin Khusmith
4 ***	Genotypic Diversity and the ability to invade host cell among environmental <i>Legionella</i> isolates in Thailand	Government Budget	Asst. Prof. Tareerat Kalambaheti

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY (Continued)			
5 *	Genetic diversity of <i>Brucella</i> strains isolated from cow and goat farm	Government Budget	Asst. Prof. Tareerat Kalambaheti
6 ***	Role and significance of arginine deiminase (ADS) in adaptation of <i>Burkholderia pseudomallei</i>	The Thailand Research Fund	Dr. Narisara Chantratita
7 *	Associations between genetic polymorphisms, innate immune responses and outcomes from sepsis in Thai patients with melioidosis and <i>S. aureus</i> infection	Welcome Trust of Great Britain	Dr. Narisara Chantratita
8 ***	The effects of Thai medicinal plants for the protection of Influenza virus	Faculty of Tropical Medicine, Mahidol University	Dr. Pornsawan Leangwutiwong
9 ***	Determination of dengue neutralizing antibodies using micro-neutralization test	Faculty of Tropical Medicine, Mahidol University	Ms. Siriporn Chattanadee
10 ***	Detection of influenza A 2009 H1N1 virus by real - time RT – PCR	Faculty of Tropical Medicine, Mahidol University	Ms. Akanitt Jittmittraphap
11 ***	Genomic approaches to metabolite exploitation from <i>Xenorhabdus</i> , <i>Photorhabdus</i>	Johann Wolfgang Goethe Universitaet Frankfurt Am Main	Dr. Narisara Chantratita
12 ***	Characterization of monoclonal antibodies specific to <i>Aeromonas sobria</i>	Faculty of Tropical Medicine, Mahidol University	Mrs. Suporn Paksanont
13 *	Holistic approach to malaria prevention and management: from bio-molecular to community research	The Commission on Higher Education (National Research University)	Prof. Srisin Khusmith
14 *	Roles of the secreted Twin-arginine translocation (TAT) protein and oxidoreductase of <i>Burkholderia pseudomallei</i> under salt stress.	Faculty of Tropical Medicine, Mahidol University	Dr. Pornpan Pumirat
15 *	Inhibitor of <i>Aeromonas hemolyzin</i> by monoclonal antibodies	Faculty of Tropical Medicine, Mahidol University	Asst. Prof. Yuwadee Mahakunkijjaroen
16 *	The role of trehalase in stress response and virulence of <i>Burkholderia pseudomallei</i>	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Muthita Vanaporn
17 *	Preparation of fully human monoclonal antibody to enterotoxin A (SEA) of <i>Staphylococcus aureus</i> by using phage display technology for further developmetn to therapeutc antibody	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Nitaya Indrawattana
DEPARTMENT OF MOLECULAR TROPICAL MEDICINE AND GENETICS			
1 *	The qualification and quantification of proteins of mefloquine-sensitive and mefloquine-resistant <i>Plasmodium falciparum</i> using mass spectrometry.	Faculty of Tropical Medicine, Mahidol University	Dr. Onrapak Riumthong
2 *	Optimization of protein sample preparation techniques for proteomic study of <i>Plasmodium vivax</i> in liver stage	Faculty of Tropical Medicine, Mahidol University	Dr. Supachai Topanurak
3 *	The study of biotransformation of oseltamivir analogue by Carboxylesterase 1 (CES1).	Faculty of Tropical Medicine, Mahidol University	Dr. Usa Dokprom
4 *	Proteomics profile of cholangiocarcinoma cell line treated with isoflavones and its derivatives	Mahidol University	Dr. Charin Thawornkuno
5 *	Molecular study of dhps and crt genes in <i>P. malariae</i> and <i>P. ovale</i>	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Naowarat Tanomsing
6 *	Molecular detection of <i>Burkholderia pseudomallei</i> in crude soil sample for environmental survey	Li Ka Shing Foundation - University of Oxford Global Health Foundation	Dr. Piengchan Sonthayanon

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF MOLECULAR TROPICAL MEDICINE AND GENETICS (Continued)			
7 *	The qualification and quantification of proteins of mefloquine resistant <i>Plasmodium falciparum</i>	Mahidol-Oxford Tropical Medicine Research Unit	Dr. Onrapak Riumthong
8 *	Molecular characterization of drug resistance in <i>P. vivax</i> .	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Asst. Prof. Mallika Imwong
9 *	Development of Antigens-base immunodiagnosis test for acute febrile illness caused by <i>Leptospira</i> spp.	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Dr. Santi Maneewatcharangsri
DEPARTMENT OF PROTOZOLOGY			
1 ***	<i>Toxoplasma gondii</i> genotyping in domestic and wild felids in Thailand	Commission on Higher Education	Assoc. Prof. Yaowalark Sukthana
2 **	Molecular Epidemiological Study on <i>Giardia</i> Contamination in Thai Vegetables	Tanad Molee - Commund Foundation	Assoc. Prof. Yaowalark Sukthana
3 ***	Molecular characterization of DNA polymerase δ of <i>Plasmodium falciparum</i> and Its role in DNA replication and DNA repair	Biotech	Assoc. Prof. Porntip Petmitr
4 ***	Molecular characterization of <i>Plasmodium falciparum</i> polynucleotide kinase	The Thailand Research Fund	Assoc. Prof. Porntip Petmitr
5 ***	Molecular characterization of <i>Plasmodium falciparum</i> polynucleotide kinase and its role on DNA repair of malaria parasites	Government Budget	Assoc. Prof. Porntip Petmitr
6 ***	PCR assays for detection of <i>Toxoplasma gondii</i> in Thai commercial meat products	Mahidol University	Ms. Rachatawan Chiabchalard
7 ***	Detection of <i>Trichomonas vaginalis</i> infection in Thai Women by PCR and culture methods	Faculty of Tropical Medicine, Mahidol University	Ms. Kanthinich Thima
8 **	Genotyping of <i>Giardia duodenalis</i> in Thai children at welfare located in/around Bangkok	Faculty of Tropical Medicine, Mahidol University	Ms. Supaluk Popruk
9 *	Identifying the Sources of Environmental Contamination by <i>Cryptosporidium</i>	The Thailand Research Fund	Assoc. Prof. Yaowalark Sukthana
10 **	Diagnosis of Central Nervous System Infection in Immunocompetent Patients	The National Research Council of Thailand	Assoc. Prof. Yaowalark Sukthana
11 **	Diagnosis of Central Nervous System Infection in Immunocompromised Patients with Single Clinical Specimen	The National Research Council of Thailand	Assoc. Prof. Yaowalark Sukthana
12 ***	Development of intestinal protozoan diagnosis by Multiplex Real Time PCR	The National Research Council of Thailand	Dr. Rachatwan Chiabchalard
13 **	Quantitative realtime PCR for detecting <i>Toxoplasma gondii</i>	Faculty of Tropical Medicine, Mahidol University	Ms. Ruenruetai Udonsom
14 *	Relationships between superoxide dismutase enzyme and intestinal protozoa infection in underweight Thai boy orphans	Faculty of Tropical Medicine, Mahidol University	Dr. Supaluk Popruk
15 *	Development of a loop-mediated isothermal amplification (LAMP) for rapid identification of <i>Naegleria fowleri</i>	Faculty of Tropical Medicine, Mahidol University	Dr. Ongart Mahitkorn
16 *	Development of nested PCR and real-time PCR assays for diagnosis of <i>Plasmodium knowlesi</i>	Faculty of Tropical Medicine, Mahidol University	Mr. Pongrut Ratprasert
17 *	Comparative proteomic study of <i>Entamoeba histolytica</i> and <i>Entamoeba moshkovskii</i> ; causative agent of human amoebiasis	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Saengduen Moonsom
18 *	Development Technique of Differentiation of Free-living Amoebae	The Thailand Research Fund	Assoc. Prof. Yaowalark Sukthana

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF PROTOZOOLOGY (Continued)			
19 *	The Role of marine bivalves as a sentinel organism for monitoring food-and water-borne Protozoa-related diseases in coastal waters	The Thailand Research Fund	Assoc. Prof. Yaowalark Sukthana
20 *	The Detection and Quantification of <i>Toxoplasma gondii</i> Captive Wildlife in Thailand		Dr. Aongart Mahittikorn
DEPARTMENT OF SOCIAL AND ENVIRONMENTAL MEDICINE			
1 ***	Modifying mosquito population age structure to eliminate dengue transmission	Gates Foundation	Assoc. Prof. Piyarat Butraporn
2 ***	Modifying mosquitoes age structure to eliminate dengue haemorrhagic fever: community participation in dengue haemorrhagic fever		Assoc. Prof. Piyarat Butraporn
3 ***	Technology transfer on the combination of effective microorganisms (EM) and Chitosan for control the environmental and diseases vectors problems using Participatory action research	Government Budget	Asst. Prof. Pongrama Ramasoota
4 **	Assessment of urinary cotinine as exposure biomonitoring to active and secondhand smoking and biomarkers of cardiovascular disease risk	The Thailand Research Fund and Commission on Higher Education	Dr. Prapin Tharnpoophasiam
5 ***	A surveillance of snail intermediate host of Schistosomiasis: <i>Schistosoma mekongi</i> (Neotricula aperta β -race) using the geographic information system in the area of Mun river, Ubon-Ratchatani Province	Faculty of Tropical Medicine, Mahidol University	Mr. Peerapol Chusongsaeng
6 ***	Development of Microorganism Killing Activity for Electronic Air Filter	The Thailand Research Fund	Asst. Prof. Pongrama Ramasoota
7 **	Local Administration Participation in Health Development Nonthaburi province	Department of Social and Environmental Medicine	Mr. Wiwat Wanarungsikul
8 ***	Variable infection rate of <i>Bithynia</i> (<i>Digoniostoma</i>) <i>siamensis</i> <i>siamensis</i> , 1 st intermediate host of liver fluke, <i>Opisthorchis viverrini</i> at endemic areas in Chacheongsao Province, Thailand	Faculty of Tropical Medicine, Mahidol University	Mrs. Yupa Chusongsang
9 ***	Development of monoclonal antibody specific to 3 ABC protein of foot and mouth disease virus using phage display technology	The Thailand Research Fund	Asst. Prof. Pongrama Ramasoota
10 *	Impact of temperature on <i>Schistosoma mansoni</i> infection in snail intermediate host <i>Biomphalaria glabrata</i> .	Faculty of Tropical Medicine, Mahidol University	Dr. Yanin Limpanon
11 *	Production of Human scFv from hybridoma cell with Dengue virus neutralizing activity	Faculty of Tropical Medicine, Mahidol University	Dr. Pannamtip Pitaksajakul
12 *	Effect of climate change on Gastro-intestinal Infectious Diseases	The Commission on Higher Education (National Research University)	Asst. Prof. Suwalee Worakunpiset
13 *	Variable of infection rate of intermediated host of liver fluke, <i>Opisthorchis viverrini</i> at endemic areas in Chacheongsao Province, Thailand.	Department of Social and Environmental Medicine, Faculty of Tropical Medicine, Mahidol University	Mrs. Yupa Chusongsang
14 *	Therapeutic and diagnostic human monoclonal antibodies against Chikungunya virus.	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Dr. Pannamtip Pitaksajakul

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF TROPICAL HYGIENE			
1 ***	Development of Health Information System for Managing Healthcare services in Remote Areas: A module for Monitoring Artemisinin Resistant Malaria Parasites	WHO-BMGF	Asst. Prof. Jaranit Kaewkungwal
2 ***	A phase II, randomized, open label, multicentre study to assess the antimalarial efficacy and safety of artemeterol (RBx11160) maleate and piperaquine phosphate coadministration and Coartem in patients with acute uncomplicated <i>Plasmodium falciparum</i> malaria	Ranbaxy Laboratories Ltd., India	Prof. Srivicha Krudsood
3 ***	Evaluation of fosmidomycin, when administered concurrently to adult subjects with acute uncomplicated <i>Plasmodium</i> malaria	Jomaa Pharma GmbH, Hamburg, Germany	Prof. Srivicha Krudsood
4 *	Th1 and Th2 cytokine expression in common mosquito borne infected samples in Thailand	The Thailand Research Fund	Dr. Natthanej Luplerdlop
5 ***	Proteomics characterization of <i>Aedes aegypti</i>	Bourse Scholarship, IRD, France	Dr. Natthanej Luplerdlop
6 **	Immunomodulation properties of <i>Aedes aegypti</i> infected mosquitoes with Dengue virus type 2 (DV2-16681) salivary protein extraction in THP-1 cells	Faculty of Tropical Medicine, Mahidol University	Dr. Natthanej Luplerdlop
7 *	Molecular techniques for identification of protective epitope and pathogenic peptides of LipL32 protein of <i>Leptospira</i> spp.	The Thailand Research Fund	Dr. Santi Maneewatcharangsri
8 *	Dynamics of microscopic and submicroscopic <i>P. falciparum</i> gametocytemia after early treatment of artesunate-mefloquine	The Thailand Research Fund	Dr. Saranath Lawpoolsri
9 **	Malaria Surveillance in endemic area by participation of Tropical Disease Surveillance	Faculty of Tropical Medicine, Mahidol University	Mr. Supalarp Puangsa-art
10 **	Spatial Epidemiology of Bacterial Contaminations of Household Drinking Water in Rural Communities of Suan Phung District, Ratchaburi Province	Department of Tropical Hygiene	Mr. Surapon Yimsamran
11 ***	Application of Geoinformatics Technology in the Assessment of Malaria Risk Area in Ratchaburi Province	Faculty of Tropical Medicine, Mahidol University	Ms. Chotipa Kulrat
12 ***	Prevalence and impact of intestinal parasitic infections in pregnant women in 3 health centers along the Thai-Myanmar border, Suan Phung district, Ratchaburi province: Field base study	Faculty of Tropical Medicine, Mahidol University	Mr. Nipon Thanyavanich
13 ***	Role of phosphoinositide 3-kinase and matrix metalloproteinases induce chronic arthritis in Chikungunya pathogenesis	Faculty of Tropical Medicine, Mahidol University	Ms. Suntaree Sangmukdanun
14 ***	Production of human VL complementary single-variable domain that interfere and/or neutralize IL-17 biological functions	Faculty of Tropical Medicine, Mahidol University	Dr. Santi Maneewatcharangsri
15 *	Mathematical modeling of optimal combinations of dengue diagnosis strategies	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Wirichada Panngam
16 *	Integrated Studies of Epidemiological, Clinical, and Biomolecular Aspects of Dengue Virus	The Commission on Higher Education (National Research University)	Assoc. Prof. Pratap Singhasivanon

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF TROPICAL HYGIENE (Continued)			
17 *	Comparative study on the recurrence of helminthiasis after selective treatment and mass treatment with single dose of 400 mg albendazole among hill-tribe Karens in border-line between Thailand and Myanmar, Amphoe Suanphung, Ratchaburi Province.	Faculty of Tropical Medicine, Mahidol University	Mr. Wanchai Maneebunyang
18 *	Effect of land use change on malaria transmission in Suanphung district Ratchaburi.	Faculty of Tropical Medicine, Mahidol University	Mr. Patiwat Sa-angchai
19 *	Surveillance and spatial-temporal distribution of Chikungunya and its impact among residents living in an area along Thai-Myanmar border of Ratchaburi province.	Faculty of Tropical Medicine, Mahidol University	Mr. Pitak Wutisen
20 *	Study of lipopolysaccharide and biofilm formation in relapsing meliodosis	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Direk Limmathurotsakul
21 *	Long-term Continuous Culture of <i>Plasmodium Vivax</i> Stages	University of South Florida, USA	Assof. Prof. Pratap Singhasivanon/ Dr. Jetsumon Prachumsri
22 *	Diagnosis of ARF in severe malaria by neutrophil gelatinase-associated lipocalin (NGAL) and liver fatty acid binding proteins (L-FABP)	The National Research Council of Thailand	Prof. Srivicha Krudsood
23 *	Investigating Urine Protein Markers in Acute Renal failure Complicating Severe Malaria	The National Research Council of Thailand	Dr. Natthanej Luplerdlop
24 *	Mathematical modeling to design a preparedness plan for the emergence of leptospirosis due to flooding and other environmental changes in Thailand.	Faculty of Tropical Medicine (Dean's Research Fund 2011)	Dr. Wirichada Panngam
DEPARTMENT OF TROPICAL NUTRITION AND FOOD SCIENCES			
1 *	Determination of genes expression profile associated to the prognosis of breast cancer and cholangiocarcinoma using Affymetrix Gene Chip and development of diagnostic kits for prognostic detection of these cancers in Thai patients by real-time PCR technique	Government Budget	Prof. Songsak Petmitr
2 ***	Development of health behaviors and nutritional status of the Tsunami victims in Phang-nga Province	Brescia University, Italy	Assoc. Prof. Karunee Kwanbunjan
3 ***	MTHFR polymorphism of folate metabolic genes and susceptibility to colorectal cancer in Thai	Government Budget	Assoc. Prof. Karunee Kwanbunjan
4 ***	Studies on toxicity of heme and oxidative stress after Exposure of antimalarial drugs on mouse macrophage Cell line (RAW264.7)	Faculty of Tropical Medicine, Mahidol University	Ms. Kriyaporn Songmuaeng
5 *	Methylation pattern in Osteoporosis	Faculty of Tropical Medicine, Mahidol University	Dr. Pornrutsami Jintaridth
6 *	Identification of plant natural products with inhibition of recombinant mosquito alpha-glucosidase	Faculty of Tropical Medicine, Mahidol University	Dr. Damrongkiat Art-harn
7 *	DNA methylation signatures at interspersed repetitive sequences within the rat brain cell during aging	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Pornrutsami Jintaridth
8 *	Screening and identification of antimicrobial compound from Bifidobacterium with inhibitory activity against <i>Clostridium difficile</i>	The Thailand Research Fund, Commission on Higher Education and Mahidol University	Dr. Amornrat Aroonual
9 *	Effect of torvoside in cholesterol synthesis in HepG2 cells	Vej-Dusit Foundation	Dr. Anong Kitjaroentham

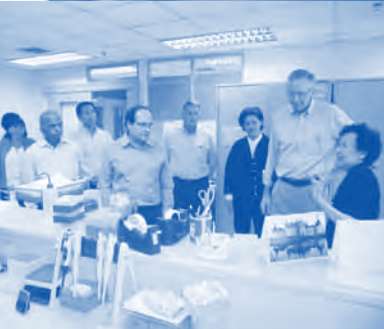
No.	Research Title	Grant	Principal investigator
DEPARTMENT OF TROPICAL PATHOLOGY			
1 ***	Proteome of cancerous squamous cells in oral cavity and salivary gland tumor	Faculty of Tropical Medicine, Mahidol University	Asst. Prof. Urai Chairsri
2 ***	Vascular model for atherosclerosis by <i>ex vivo</i> support system (EVS)	Government Budget	Assoc. Prof. Yaowapa Maneerat
3 *	Gene expression profiles in involve in pathogenesis of atherosclerosis and acute coronary heart disease: A study in Thai patients	Government Budget	Assoc. Prof. Yaowapa Maneerat
4 ***	Proteome of cancerous squamous cells in oral cavity and salivary gland tumor	Government Budget	Asst. Prof. Urai Chairsri
5 ***	Exploring Transcriptional factor-Nuclear Factor kappa B (NF- κ B) activation in malaria as a new regulating factor in the pathogenesis of malaria	Faculty of Tropical Medicine, Mahidol University	Assoc. Prof. Parnpen Viriyavejakul
6 ***	Excretory secretion from infective stage <i>Gnathostoma spinigerum</i> larva decrease function of human cytotoxic immune cells	Faculty of Tropical Medicine, Mahidol University	Assoc. Prof. Yaowapa Maneerat
7 ***	Exploring Transcriptional factor-Nuclear factor kappa B (NF- κ B) as a prognostic factor in developing acute renal failure in <i>Plasmodium falciparum</i> patients	The Vejdusit Foundation	Assoc. Prof. Parnpen Viriyavejakul
8 *	Study of apoptosis in the liver of severe malaria patients.	Faculty of Tropical Medicine, Mahidol University	Mr. Vasant Kajornsakumeth
9 *	Sphingosine 1 phosphate expression in the brain of severe malaria.	Faculty of Tropical Medicine, Mahidol University	Ms. Rungrat Nintasen
10 *	Investigating Causes of Acute Renal Failure in Severe Malaria by Histopathology and Immunohistochemistry	The National Research Council of Thailand	Assoc. Prof. Parnpen Viriyavejakul
DEPARTMENT OF TROPICAL PEDIATRICS			
1 *	Efficacy and safety of Dengue vaccine in healthy children aged 4 to 11 years in Thailand (CYD23)	Sanofi Pasteur Co., Ltd.	Prof. Arunee Sabchareon
2 ***	A controlled study of the safety and immunogenicity of ChimericVaxTM Japanese encephalitis vaccine in Thai toddlers and children	Sanofi Pasteur Co., Ltd.	Prof. Arunee Sabchareon
3 ***	Evaluation of long-term immunity against Japanese encephalitis in Children vaccinated with Japanese encephalitis Vaccine	Department of Tropical Pediatrics	Assoc. Prof. Pornthep Chanthavanich
4 ***	Accuracy assessment of using WHO criteria in diagnosis of dengue infection	Department of Tropical Pediatrics	Assoc. Prof. Pornthep Chanthavanich
5 ***	FavirabTM post prescription event monitoring	Sanofi Pasteur Co., Ltd.	Assoc. Prof. Pornthep Chanthavanich
6 ***	The comparison of immunogenicity and adverse reactions after immunization with Japanese Encephalitis vaccine produced by BIKEN and Government Pharmaceutical Organization (GPO) in healthy Thai children (JE0150)	The Government Pharmaceutical Organization	Assoc. Prof. Pornthep Chanthavanich
7 ***	Evaluation of long term immunity against rabies in children vaccinated with different pre-exposure regimens of PCEC (Rabipurá) and the exposure in the children previously vaccinated with PCEC pre-exposure regimens (I49P6)	Department of Tropical Pediatrics	Asst. Prof. Kriengsak Limkittikul
8 ***	Protective Antibodies Against Erythrocyte Invasion Ligands in <i>Plasmodium falciparum</i> in Thailand	Faculty of Tropical Medicine, Mahidol University	Asst. Prof. Watcharee Chocejindachai
9 **	Development of human monoclonal antibody specific to dengue virus	JST-JICA project	Asst. Prof. Kriengsak Limkittikul

No.	Research Title	Grant	Principal investigator
DEPARTMENT OF TROPICAL PEDIATRICS (Continued)			
10 *	Serum immunoglobulin (IgG, IgA, IgM and IgG subclass) levels in Thai children age 0-2 years old determined by Nephelometry	Faculty of Tropical Medicine, Mahidol University	Dr. Raweerat Sitcharangsri
11 *	Immunogenicity and safety of activated vero cell devired Japanese Encephalitis vaccine in Thai children	Liaoning Cheng Da Biotechnology Co., Ltd. China	Assoc. Prof. Pornthep Chanthavanich
12 *	A Phase III, observer blind, randomized, non-influenza vaccine comparator-controlled, multi-country and multi-centre study of the efficacy of GSK Biologicals quadrivalent, inactivated, split virion, seasonal influenza vaccine candidate, GSK2282512A (FLU QQIV), administered intramuscularly in healthy children 3 to 8 years of age	GlaxosmithKline (Thailand) Ltd.	Assoc. Prof. Pornthep Chanthavanich
CENTER OF EXCELLENCE FOR ANTIBODY RESEARCH (CEAR)			
1 **	Studies on oxidative stress activation by various Thai medicinal plants, radiation, and X- ray <i>in vitro</i>	Government Budget	Ms. Cheeraratana Cheeramakara
2 ***	Study on mouse macrophage cell (RAW 264.7) functions after exposure of artemisinin derivatives <i>in vitro</i>	Faculty of Tropical Medicine, Mahidol University	Mr. Naphachai Suthisai
VACCINE TRIAL CENTRE			
1 ***	A Randomized, international, Double-Blinded (With In-House Blinding), Controlled With GARDASILTM,Dose-Ranging, Tolerability, Immunogenicity, and Efficacy Study of a Multivalent Human Papillomavirus (HPV) L1 Virus-Like Particle (VLP) Vaccine Administered to 16 to 26 Year Old Women	Merck & Co., Inc	Prof. Punnee Pitisuttithum
2 ***	A phase III trial of Aventis Pasteur live recombinant ALVAC-HIV (VCP1521) priming with Vaxgen gp 120 B/E (AIDSVAX B/E) boosting in HIV-uninfected Thai adults	Walter Reed Army Institute of Research	Dr. Supachai Ruekngam (Prof. Punnee Pitisuttithum)
3 ***	Phase II/III safety and immunogenicity of pandemic live attenuated influenza vaccine (PLAIV) candidate strain A/17/CA/2009//38 (H1N1) in healthy Thais	Thai Health Promotion Foundation	Prof. Punnee Pitisuttithum
4 *	Phase III Clinical Trial to Study the Immunogenicity, Tolerability, and Manufacturing Consistency of V503 (A Multivalent Human Papillomavirus [HPV] L1 Virus-Like Particle [VLP] in Preadolescents and Adolescents (9 to 15 years old) with a Comparison to Young Women (16 to 26 years old)	Merck & Co., Inc	Prof. Punnee Pitisuttithum
THE TROPED DIAGNOSTIC CENTER			
1 **	A new diagnostic tool of concentrating Dengue virus surface antigen by the cooperate between Magnetic beads and conventional RT-PCR	Faculty of Tropical Medicine, Mahidol University	Ms. Hathairad Hananantachai
2 *	Potential anti-aging activity of crude rice oil extracted from cadmium-contaminated rice determined with an <i>in vitro</i> human fibroblast cell model	Faculty of Tropical Medicine, Mahidol University	Ms. Hathairad Hananantachai

* New Project

** Finished Project

*** Ongoing Project



Mahidol University 2012

Faculty of Tropical Medicine,

LIST OF Publications and Presentations



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36.	Ekataksin W, Chanwimalueang N, Nitiwarangkul W. Diagnosing lymphedema with MRI: A redefinition for therapeutic purposes. The 23 rd International Congress of Lymphology 19-23 September 2011, Malmö, Sweden P. 105
37.	Ekataksin W, Chanwimalueang N, Suebtrakul P, Piyaman P, Wongwat P, Khajornsakumeth W. Thailand Lymphedema Day Care Center: Proposing a format for managing lymphedema under limited resources. The 23 rd International Congress of Lymphology 19-23 September 2011, Malmö, Sweden P 98
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41.	Ekataksin W. Lymphedema profunda: A new clinical entity a new role added for lymphologists. The 23 rd International Congress of Lymphology 19-23 September 2011, Malmö, Sweden P.103
42.	Ekataksin W, Chanwimalueang N, Teerachaisakul M. Slaeng: Faith, Fact, and not False, of Thai Food Concept in Health and Disease. The 3 rd International Conference on Natural Products for Health and Beauty 16 – 18 March 2011, P 49.
43.	Ekataksin W, Chanwimalueang N. Slaeng: An Ancient View of Food Aggravation Projected on Modern Clinical Nutrition through A Vast Experience from 2,011 Patients with Lymphedema. The 7 th Asia Pacific Conference of Clinical Nutrition 5 – 8 June 2011, P 14.

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96.	Pan-ngam W. "Modeling of Infectious disease Centre" at Lao People's Democratic Republic; Oxford Networking Meeting (14 - 16 February 2011).
97.	Pengsaa K, Hattasingh W, Chantrakul N, Chocejindachai W. Falciparum malaria complicated by autoimmune hemolytic anemia: a case report. The 9 th International Congress of Tropical Pediatrics, October 18-20, 2011, Queen Sirikit National Convention Center, Bangkok, Thailand.
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100.	Pitisuttithum P. AIDS Vaccine for Asia Network (AVAN): Expanding the regional role in developing HIV vaccines. WHO-UNAIDS Vaccine Advisory Committee (VAC) meeting/ Istanbul, Turkey.
101.	Pitisuttithum P. Phase I/II Safety and Immunogenicity of Pandemic Live Attenuated Influenza Vaccine (PLAIV) Candidate Strain A/17/CA/2009/38 (H1N1) in Healthy Thais. The 7th Meeting on evaluations of pandemic influenza prototype vaccines in clinical trial/Geneva, Switzerland.
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104.	Piyaman P, Ekataksin W, Kaneda K. Microarchitecture of prelymphatic system in rat liver and interface to lymphatics revealed by three-dimensional reconstruction. The 23rd International Congress of Lymphology 19-23 September 2011, Malmö, Sweden P.172
105.	Piyaphanee W, Kittrakul C, Punrin S, Charoenpong P, Olanwjitwong J, Ponam T, Kerd Siri P, Tangkanakul W, Tantawichien T. Risk of Possible Exposure to Rabies among Travelers from Developed Countries in Southeast Asia. Congress of International Society Travel Medicine, USA, 8-12 May 2011.
106.	Piyaphanee W. Case studies in Travel/Tropical Medicine. <i>Global Health Course, University of Minnesota, USA.</i>
107.	Piyaphanee W. Common Problem in returning travelers. Joint Congress to the ICTP: 3rd Travel and Adult Immunization.
108.	Pojjaroen-anant C, Wisetsing P, Pengsaa K. Decreased prevalence of intestinal parasitic infestation in school-aged children in Bangkok, Thailand. The 9 th International Congress of Tropical Pediatrics, October 18-20, 2011, Queen Sirikit National Convention Center, Bangkok, Thailand.
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| 118. | Rijken M. Normal and abnormal fetal growth: Early fetal growth in malaria infected pregnancies. 21st World congress on Ultrasound in Obstetrics and Gynecology 2011. |
| 119. | Rijken M. Prediction and diagnosis of placental disease: Placental volume in malaria infected pregnancies. 21st World congress on Ultrasound in Obstetrics and Gynecology. 2011. |
| 120. | Russell B, Suwanarusk R, Borlon C, Costa FT, Chu CS, Rijken MJ, Sriprawat K, Warter L, Koh EG, Malleret B, Colin Y, Bertrand O, Adams JH, D'Alessandro U, Snounou G, Nosten F, Rénia LA. Robust ex vivo Invasion Assay of Human Reticulocytes by <i>Plasmodium vivax</i> . 7th Annual BioMalPar Conference Biology and Pathology of the Malaria Parasite EMBL Heidelberg, Germany Monday 16 May - Wednesday 18 May 2011. |
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