07

RESEARCH EXCELLENCE

Mahidol University has set its goal to be a research university with high academic capacity and competitiveness in international arenas. The strength of the university is in medical sciences, science and technology, social sciences, humanities and fine arts.

Mahidol University is the leading university establishing 4 National Centers of Excellence, under the higher education development projects called Science and Technology Postgraduate Education and Research Development Office (PERDO), as follows:

Center of Excellence on Environmental Health, Toxicology and Management of Chemicals (ETM)

Center of Excellence for Innovation in Chemistry (PERCH-CIC)

Center of Excellence in Mathematics (CEM)

Center of Excellence in Medical Biotechnology (in final stage of establishment)

Mahidol University in collaboration with the National Science and Technology Development Agency (NSTDA), has established 2 centers of excellence in nanotechnology.

1.NANOTEC-MU Excellence Center of Intelligent Materials and Systems at Faculty of Science

2. NANOTEC-MU Excellence Center of Nanotechnology for Cancer Diagnosis and Treatment at Faculty of Medicine Siriraj Hospital

In 2011-2013, Mahidol University has been selected as one of National Research Universities to foster research clusters and research centers as follows :

Research Clusters	Research Centers
1. Cluster of Cardiovascular Diseases and Metabolic Research	1. Center for Emerging and Neglected Infectious Diseases Research
2. Cluster of Innovation in Social Science, Education and Environmental Management for Human-being	2. Center for Research in Complex Systems Sciences
3. Cluster of Enhancing Competitive Advantage of Healthcare Service in Thailand	3. Center for Thalassemia Research
4. Cluster of Music Therapy	4. Center for Aquatic Animals Research
	5. Center for Biopharmaceutical Development and Innovative Therapy

Since 2012, Mahidol University has been establishing university research networks in many important areas, such as stem cells, biomedical engineering, health care logistics, vaccines, neuroscience and aging society.

Mahidol University has established long term research collaborations with various international institutes. The collaboration between Mahidol University and University of Oslo, Norway has been continuously extended for the last 42 years. There have been more than 30 years of close cooperation with Oxford University, UK and Osaka University, Japan.

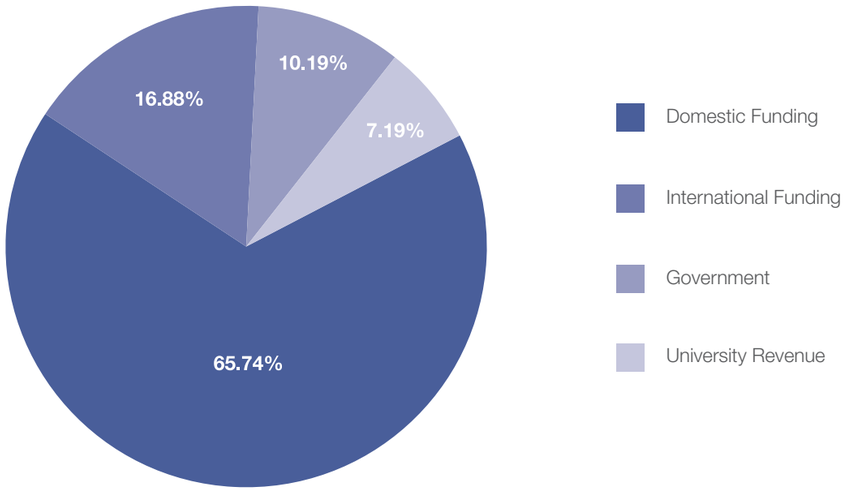
Mahidol University and Osaka University have established Collaborative Research Center (MU-OU: CRC) for Bioscience and Biotechnology at Faculty of Science to conduct highly advanced multidisciplinary research. Furthermore, Mahidol-Osaka Center for Infectious Diseases (MOCID) and Mahidol-Oxford Tropical Medicine Research Unit have been also established at Faculty of Tropical Medicine. In addition, Mahidol University has 6 WHO Collaborating Centers (WHO-CCs) situated in Faculty of Medicine Siriraj Hospital, Faculty of Nursing, Faculty of Tropical Medicine, Institute of Nutrition, ASEAN Institute for Health Development and Institute for Population and Social Research.

List of WHO Collaborating Centres (WHO-CCs) in Mahidol University

No.	Organization	Area of Expertise	Contact Person
1.	Institute for Population and Social Research (IPSR)	Research in Human Reproduction	Assistant Professor Sureeporn Punpuing Ph.D.
2.	Otological Center BKK Unit Dept. of Oto-Rhino-Laryngology Siriraj Hospital	Prevention of Deafness and Hearing Impairment	Professor Emeritus Suchitra Prasansuk Dr. Samut Chongvisal
3.	ASEAN Institute for Health Development	Primary Health Care Development	Dr. Jumroon Mikhanorn Associate Professor Boonyong Keiwkarnka
4.	Institute for Nutrition	Community Nutrition and Food Safety	Professor Visith Chavasit
5.	Faculty of Tropical Medicine	Clinical Management of Malaria	Professor Polrat Wilairatana
6.	Faculty of Nursing Siriraj Hospital	Nursing and Midwifery Development	Dean, Professor Fongcum Tilokskulchai

MAHIDOL UNIVERSITY RESEARCH FUNDING IN 2012

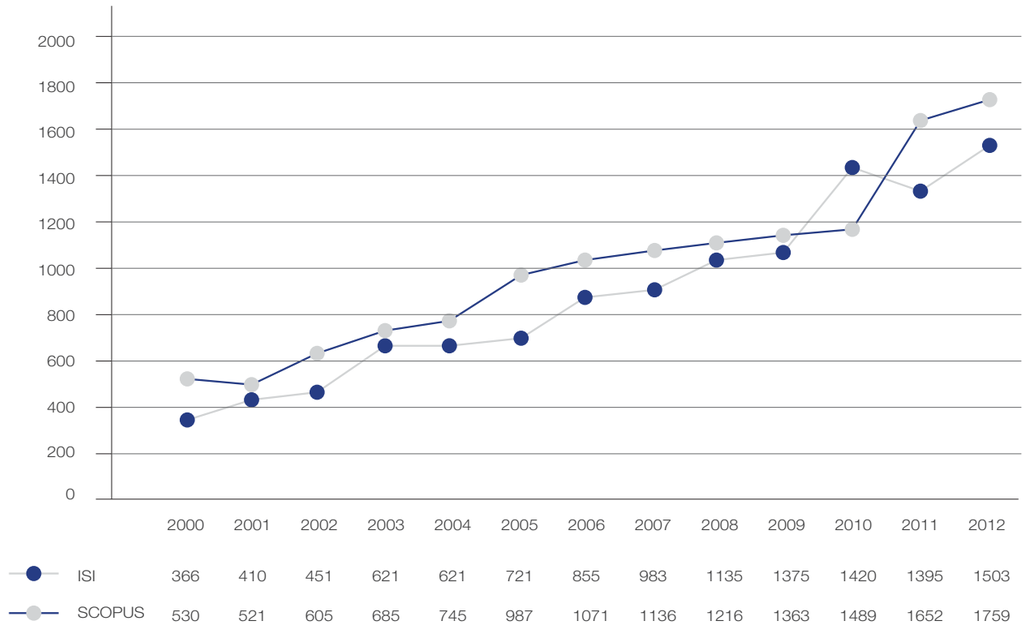
Mahidol University Research Funds 2012



NUMBER OF PUBLICATIONS IN ISI AND SCOPUS

Number of Publications

All Document Types Indexed in ISI & SCOPUS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
ISI	366	410	451	621	621	721	855	983	1135	1375	1420	1395	1503
SCOPUS	530	521	605	685	745	987	1071	1136	1216	1363	1489	1652	1759

INTELLECTUAL PROPERTY

Intellectual Properties Management Fiscal Years 2009 - 2012

Type of Intellectual Property	Applied				Approved			
	2009	2010	2011	2012	2009	2010	2011	2012
1. Patent : Thai	33	24	23	39	1	-	2	3
: International	-	1	-	-	2	2	1	-
2. Petty Patent	28	20	23	22	12	12	30	19
3. Copyright	23	29	20	52	17	28	27	49
4. Trademark	1	-	4	2	-	3	1	4
5. Trade Secret	-	13	1	-	-	13	-	1
Total	**85**	**87**	**71**	**115**	**32**	**58**	**61**	**76**

APPLICATION OF MAHIDOL UNIVERSITY INTELLECTUAL PROPERTIES

Type of Intellectual Property	The Number of Intellectual Property			
	2009	2010	2011	2012
1. Patent License / Petty Patent License	3	2	2	3
2. Copyright License	5	4	5	5
3. Production and Distribution	3	6	3	2
Total	**11**	**12**	**10**	**10**

Professor Dr. Piyarat Govitrapong
Research Center for Neuroscience,
Institute of Molecular Biosciences and Faculty of Science

- Mechanism of amphetamine-induced neuronal death and neurodegeneration

Dr. Piyarat Govitrapong is an internationally recognized neuroscientist and researcher with outstanding research achievements in neurosciences concentrating mainly on melatonin. Dr Piyarat Govitrapong's research is motivated by finding the molecular mechanisms of drug addictions and is dedicated to finding avenues for their treatments. Her recent study has demonstrated that amphetamine treatment causes disturbances in the dopamine system that may predispose individuals to Parkinsonism. She demonstrated that melatonin provided neuroprotection against amphetamine-induced neurotoxicity. Recently, her research project titled "Mechanism of amphetamine-induced neuronal death and neurodegeneration" received 1st place for Outstanding Research Award of the year of 2011 from the National Research Council of Thailand (NRCT). The results of these studies will provide new avenues for finding therapeutic regimens to delay the development of neurotoxic reactions and eventually finding refined therapeutic modalities in dealing with drug addiction in our society.

Dr. Govitrapong's research team has discovered for the first time that melatonin has a neurotrophic function and hence is involved in neurogenesis. The identification of signaling molecules that regulate neural stem cell activities may contribute to the understanding of neural ontogeny and to the development of new growth factor agents for the treatment of certain neurological diseases. Recent studies in Dr. Govitrapong's laboratory show that melatonin modulates the proliferative ability of precursor cells from adult mouse subventricular zone and subgranular zone in a concentration-dependent manner. Besides increasing the proliferation, her data also demonstrates that melatonin facilitates the transformation of precursor cells into neurons. As stem cell replacement is thought to play an important therapeutic role in neurodegenerative diseases, melatonin may be beneficially used for stimulating endogenous neural stem cells. Because melatonin can cross the blood brain barrier and is soluble in both lipid and water, this intrinsic modulator may be used for stimulating endogenous neural stem cells. It is anticipated that clarification of the sites and mechanisms underlying the induction and modulation by melatonin will indicate novel strategies for the treatment of neurodegenerative diseases and neurodevelopment disorders.

Dr. Piyarat Govitrapong is leading this research program with strong determination to understand the basic mechanism of melatonin. Her scientific discoveries have led to many important scientific publications, both in journals and textbooks and her findings are crucial in improving treatments for patients with brain diseases.

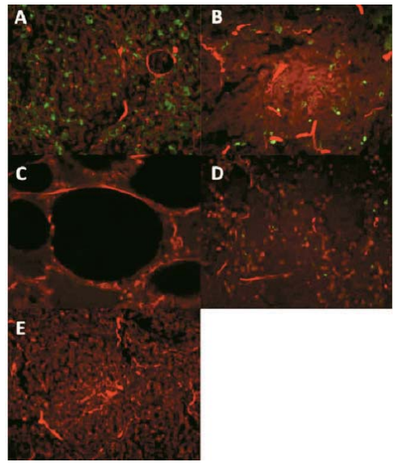
Professor Dr. Prasert Auewarakul, M.D.
Department of Microbiology
Faculty of Medicine Siriraj Hospital
Director of Institute of Molecular Biosciences

- Pathogenesis of severe influenza infection

Although most influenza infections are self-limited and do not require hospitalization, severe influenza infections leading to pneumonia and respiratory failure are still a big problem. Severity of influenza infection depends on both viral strains and host conditions. New influenza strains, such as pandemic viruses and avian influenza viruses, are often more virulence in humans than seasonal influenza strains. Although chronic conditions, such as diabetes and chronic pulmonary diseases, are known to increase the risk of severe influenza infection, many severe cases in previously healthy young adults have been commonly seen in the recent 2009 influenza pandemic. The reason for the increased severity in these individuals is not well understood. Dr.Prasert Auewarakul sought to understand this complex viral-host interaction and the virulence level of influenza strains.

Dr. Auewarakul observed an interesting increase in the level of viral receptor in lung tissue of a fatal case of 2009 pandemic influenza. This case was a previously healthy young adult, who had very high viral load in his lung and succumbed to respiratory failure despite proper antiviral treatment and the absence of drug-resistance mutation. He studied the level of viral receptor in the lung tissue of this patient, and surprisingly observed a very high level of viral receptor in the lung tissue as shown in figure below. He has previously shown that allergic conditions could enhance the viral receptor expression in human upper respiratory tract. These suggest that 1) viral receptor expression can be variable among individuals, and 2) the receptor availability can determine the outcome of influenza infection. This new hypothesis merits further exploration. It may help understand the risk of severe influenza and pave way for new preventive and therapeutic interventions.

On the viral side, the common occurrence of severe pneumonia in the 2009 influenza pandemic attracted his attention. The mechanism for the increased virulence in this virus has not been well characterized. He hypothesized that the viral interaction with our innate defense may be involved and tested the 2009 pandemic virus for its sensitivity to anti-influenza activity of human bronchoalveolar fluid in comparison to seasonal influenza strains. Interestingly, most of the pandemic influenza strains were much more resistant to the innate anti-influenza activity than seasonal influenza strains. Recently, he has identified the genetic determinant of this resistance and shown that it affect the viral virulence in a mice model. This will help us understand the complex viral-host interaction, the viral adaptation to human hosts, and the effect on the viral virulence.



(Boonarkart et al, J Med Virol 2012; 84: 380-385)

A Team of Research from Faculty of Medical Technology

- Development of Diagnostic Tools and Bioactive Compounds for Biomedical Applications

This research project coincides with the strategic directions of Mahidol University, which aim to utilize knowledge and information technology in fostering the creation of wisdom innovation for development of diagnostic instruments and for promotion of sustainable development. These will ultimately lead to the following outputs:

1. Creation of knowledge that will be useful for development of diagnostic applications.

2. Development of systems for identification of bioactive compounds as well as in lead identification and refinement.

3. Utilizetion of data mining and computational methods for development of predictive models for modeling the biological activity of compounds.

4. Development of prototype of tools or diagnostic kits using appropriate technologies, which ultimately will culminate in the self-sufficiency of the country as well as reduce the import of expensive instrumentation from overseas.

The research project had successfully:

1. Discovered and extracted over 40 bioactive compounds from natural sources exerting antioxidative, antibacterial, anticancer and multifunctional biological activities.

2. Constructed 6 predictive models of bioactive compounds for modeling and studying the molecular mechanisms of their biological activities.

3. Developed bacterial cell-based system for screening of antioxidative activity of compounds, which can be used as an economical approach for indicating the toxicity of compounds.

4. Developed 2 data mining software for data analysis and model building.

5. Developed methods which can be used for diagnostic analysis (i.e. employed magnetized nanoparticles for cancer detection and malarial infection, utilizing gene detection methods for screening of drug-resistant Neisseria gonorrhoeae and Methicillin-resistant Staphylococcus aureus (MRSA) as well as employing LAMP and ion-sensitive field effect transistor (ISFET) in developing detection methods for Salmonella) and may hold great potential for further development as Point-of-Care test.

6. Made use of advanced computational methods for analyzing the quality of x-ray images from computer-based x-ray system, which helps to promote the advancement of quality and standards of radiology to be at the international level.

7. Developed knowledge for diagnostic applications from the engineering of 4 chimeric proteins with the ability to bind oxygen as well as able to possess anti oxidative prosperous comparable to that of native protein, which can be used for further development as artificial oxygen carriers.

8. Modeled the transportation and delivery of 6 chimeric proteins to brain endothelial cell between Antioxidant protein (i.e. Catalase and SOD) and peptide possessing the ability to permeate the blood-brain barrier (i.e.Angiopep and HIV1-tat).

9. Identified biomarkers as indicators (arising from cell injury) is correlated with hypertension that can be used in gaining more understanding into the etiology of the disease as well as used for diagnosing individuals with hypertension and discovered the relationship between SNP 440 A/T from FUT2 gene with respect to the secretor status, which is able to be used as indicators of dyspepsia in the Thai population.

10. Studied the response mechanism of tumor cells against anti-cancer agents that can be used in the effective development of methods for treating cancer patients.

From the aforementioned results of the research output from the fiscal year of 2012 culminated in the dissemination of knowledge in the form of publication of 25 research articles in international journals (i.e. comprising of 9 published articles, 3 in press article, 10 submitted articles and 3 articles in preparation). This result in a total of 41 total publications. The project also produced 21 young scholars (i.e. comprising of 11Ph.D. students and 10 M.Sc. students; 1 Ph.D. student had already graduated, 2 Ph.D. students are nearing completion of their thesis and 4 M.Sc. students had already graduated) Aside from this, the project had also produced 17 young scientists by establishing research collaborations with 3 local institutes and 3 foreign institutes.

From the aforementioned successes, the Faculty of Medical Technology strives to add value and develop novel bioactive compounds as well as perform in-depth studies on the mechanisms of these biological activities. Aside from this, the Faculty also tries to develop knowledge and methodologies to create prototypes of diagnostic tools as well as translating such know-how into practical applications.

Associate Professor Dr. Sutee Yoksan
Center for Vaccine Development
Institute of Molecular Biosciences

- Live - Attenuated Tetravalent Dengue Vaccine

Dengue virus (DENV) is a mosquito-borne flavivirus endemic to tropical and subtropical regions of the world. Four antigenically related serotypes of DENV circulate in nature. While 2/3 of these infections are inapparent, clinical manifestations range from a self-limited febrile illness to a potentially fatal disease characterized by hemorrhage and/or shock.

As the immune response elicited by natural DENV infection confers life-long protection against re-infection by viruses of the same serotype, vaccination and immunologic protection against DENV should be feasible. The development of a DENV vaccine is complicated by a requirement to protect simultaneously against the four serotypes of DENV and the potential for a suboptimal vaccine-induced immune response to exacerbate disease.

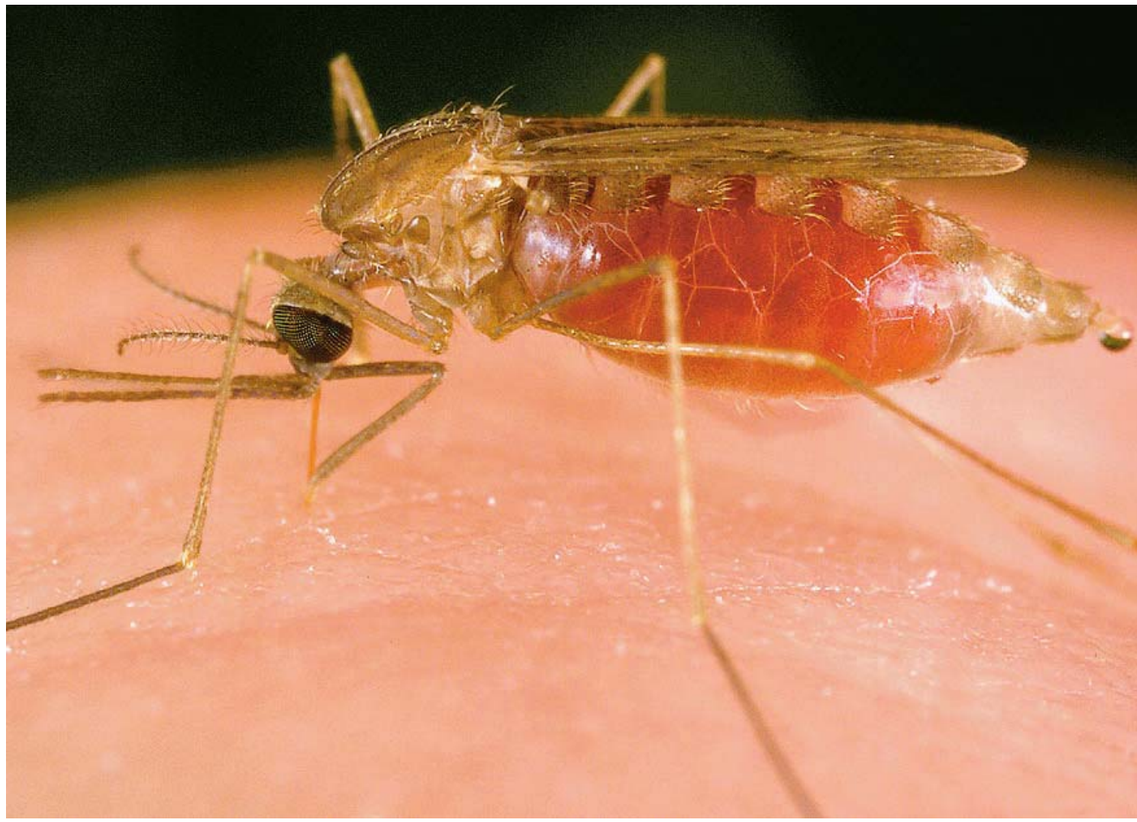
Development of live attenuated tetravalent DENV vaccine has been actively pursued at Mahidol University since 1980 using a classical method of attenuation pioneered by Louis Pasteur, the serial passaging of a virulent organism in a non-natural host.

The process selects for mutations that differ between viruses by selection mechanisms that are not well understood. There are no established genetic markers that guarantee attenuation of DENV. The introduction of purposeful alterations into viral genomes or the generation and selection of mutations using empirical or classical methods are valid ways to select DENV vaccines. Every method of producing a viral vaccine candidate results in a biological agent that must be thoroughly characterized and finally tested in human volunteers.

Wild type DENV used for attenuation attempts at Mahidol had been derived from a population of viruses recovered from infected individuals which composed of viruses circulate as quasispecies populations of genetically different virions. The discovery of selection pressure on wild type DENV afforded by Primary Dog Kidney (PDK) cells was made. In this effort all 4 DENV replicated in PDK. Each of these viruses was tested individually at different passage levels for biological markers. Successful individual candidate vaccines were identified for all DENV1-4. When combined, the mixture of those viruses resulted in balance of immune responses among all the 4 serotypesin primates.

Extensive viral biomarker and clinical trial experience at Mahidol University revealed two conclusions concerning the use of PDK cells to select attenuated DENV: 1) serial passage in PDK cells uniformly selected for attenuation of all four DENV for human beings and 2) attenuation biomarkers appeared during each set of serial passages at approximately the same PDK passage level. This latter observation suggested that PDK passage subjected each of the four DENV with reproducible selective pressure.

As high potential vaccine candidates, such a live attenuated tetravalent DEN vaccine was licensed to vaccine biopharmaceutical industry for industrial scale up. After decades of working with live attenuated dengue vaccines, several objectives could be achieved. The safe and well tolerated vaccines could be identified. Strong and long lasting immune responses could be obtained as a result of using suitable virions similar to natural viruses which still could elicit strong stimulation to both the humoral and cell mediated immunities. The prospects for these DENV vaccines appear very promising.



Associate Professor Wasun Chantratita
Faculty of Medicine Ramathibodi Hospital

- Pharmacogenetics Screening Test in Thailand: Steps toward Personalized Medicine

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) are still major health problems of the world including Thailand. There are changes in several aspects of HIV/AIDS worldwide particularly in Thailand, for instance, declining HIV-related morbidity and mortality due to implementation of national policy of providing free access to antiretroviral therapy. Because life-long therapy with combination antiretroviral drugs is needed, adverse drug reaction will have an impact on patients' tolerability and adherence. For example, nevirapine which has been one of the common uses of antiretroviral agents can be associated with rash with an incidence of 15-20%. Therefore, assays that predict or more readily diagnose drug-induced toxicity are needed.

Then how can we be sure we are indeed maximizing health benefits globally? When it comes to the developing world, some believe that pharmacogenomics application will be too expensive to adopt. However, it has recently been argued that pharmacogenomics can also be practically applied to improve the health of people and reducing medical expenditure in the developing world.

One of pharmacogenomics projects in Thailand has been started since 2004 with the support mainly from Thailand Center of Excellence for Life Sciences (TCELS), Thai Ministry of Public Health, and RIKEN Center for Genomic Medicine, Japan. This project has not required a new gene discovery. On the contrary, the project has emphasized on studies of whole genome scanning of human genetic variation to make it possible to efficiently and effectively scan the human genome. They identified a subset of 500,000-600,000 "tag" single nucleotide polymorphism (SNPs) that provide the majority of information contained in the entire set of 9-10 million common SNPs present in the human genome as well as selecting candidate genes on pathways for drug action, activation, and elimination in humans and identifying variances in the gene sequences. These variances can then be studied both on a biochemical level to assess their functional significance in drug action (pharmacogenomics) and a population level (pharmacogenetics) to establish statistical associations with observed phenotypic variances in drug action.

The TCELS's pharmacogenetics screening test under the code name of PGX ADR All-in-One has been developed. So far, it could simultaneously detect HLA-B*1502, HLA-B*5801, HLA-B*5701, HLA-B*3505, HLA-B*4001 adverse drug reactions associated with the usage of carbamazepine (anticonvulsants), allopurinol (hyperuricemia treatment), abacavir (antiretroviral drug), nevirapine (antiretroviral drug), and stavudine (antiretroviral drug). These drugs could cause severe adverse drug reactions, such as Stevens-Johnson sundrome, hypersensitivity, and lipodystrophy syndrome. The assay was finally received the Thailand Innovation Awards in 2011.

This pharmacogenetic screening system would also be a major step forward, and the first of its kind in the realization of personalized antiretroviral medicines, in which appropriate, inexpensive treatment is given to each individual patient in developing countries, according to genetic information.

Dr. Pearmsak Makaraphirom
Institute of Human Rights and Peace Studies

- Action Research Project for the Development of People's Participation to Manage Saiburi Watershed (phase II)

This project was aimed to investigate local knowledge on natural resources in Saiburi watershed, employ these knowledge to build public policy processes and watershed community, build capacity of the researcher as well as design community and watershed natural resource plan in a participatory manner.

This paper is the first 6-months report, covering August 2011 to January 2012, of the Saiburi Watershed Research Project phase II, consisting of research plan, strategic formulation, research team building, and the building of learning processes for university researchers and local researchers in conducting field research for resource management in the watershed with local people and community. This report was divided into 5 parts. Part I describes background and objectives of the research project. Part II describes research framework. Part III describes progress of research work. Part IV describes report summary and financial report. And Part V describes research plan for the next 6-months period. Appendixes included 6-months research activities plan, field visit reports, project meeting reports, training reports, as well as a report of the Saiburi watershed community organization council's meetings. Problems and obstacles in the first 6-months period identified were the unsafe of researchers due to political violence events, flooding both in the coordinating office in Bangkok and in the field research sites, difficulty in communication in the field, and the distrust of local people in political violence events. The research team has been trying hard to deal with these problems to keep research activities going smoothly.

Associate Professor Dr. Kanokporn Triwitayakorn
Institute of Molecular Biosciences

- Molecular Breeding of Cassava

Cassava is one of the most economically important crops in Thailand. During the years 2009-2011, Thailand produced some 22 million tons of cassava and exported it in the forms of cassava flour, chips and pellets generating a total income of about 66 thousand million baht. However, decreased cassava production has been reported due to problems with outbreaks of pests and diseases as well as natural disasters including flood and drought. At the same time as the production of cassava has been limited, demand for cassava products for industrial applications has increased, especially for ethanol production. Therefore, breeding of cassava with high yield and resistance to pests and diseases is essential in order to secure a sufficient supply for cassava industries. Generally, cassava breeding programs in Thailand are based on conventional breeding methods which have important drawbacks, including time and cost requirements. Additionally, breeding for some traits, especially resistance to pests and diseases that cannot be directly observed in the field is not effectively achieved by conventional methods. Therefore, the application of molecular marker technology to assist with breeding programs is essential to overcome these limitations to develop new cassava varieties with desirable properties that are suitable for both agricultural and industrial uses.

Our work over the last 6 years has focused on developing the most important tool for molecular based breeding programs, a high resolution genetic linkage map of cassava. Two F1 mapping populations were created in 2006 by reciprocal crosses between 'Huay Bong 60', a cultivar with high fresh root yield, starch and cyanogen content, and 'Hanatee', a Thai variety that has low fresh root yield, starch and cyanogen content. Subsequently, 2,140 molecular markers consisting of 640 Simple sequence repeat (SSR) and 1,500 Expressed sequence tag-simple sequence repeat (EST-SSR) markers were developed and combined with additional markers from published databases. All of these markers were applied for cassava genetic linkage map construction. This map is composed of 510 loci, encompassing 1,420.3 cM, distributed on 23 linkage groups with a mean distance between markers of 4.54 cM. The map was applied to identify for quantitative trait loci (QTL) underlying agronomically important traits including fresh root yield, starch and cyanogen content, starch physicochemical properties and plant and first branch height as well as resistance to diseases that will be effectively applied to marker assisted selection (MAS) of cassava breeding programs in Thailand.

In addition, some of the F1 lines showed higher levels of fresh root yield and starch content, but lower cyanide content compared to Huay Bong 60. These potential lines are now in process of the second year evaluation after they showed great results in the first year. These lines thus are capable and suitable for new cassava varieties. The results and products of this project will directly benefit cassava farmers in terms of increasing in their productivity which will lead to a better quality of their life due to higher income. The Thai economy will also gain from the increased export of cassava and its products. Moreover, improvement in the income of farmers will lead to increased domestic consumption which, in turn, induces the expansion of related product sectors. Consequently, the Thai economy will eventually gain from developing MAS of cassava from this project.

Associate Professor Dr. Duangpun Singkarin
Faculty of Engineering

- Cluster of Enhancing Competitive Advantage of Healthcare Service in Thailand

The Cluster of Enhancing Competitive Advantage of Healthcare Service in Thailand creates research projects that enhance competitive advantages for healthcare services. The contributions are both of evidence based and academic based. The innovation can be implemented for change and solving the country's problems.

In recent years, the cluster presented a new design theory for the definition of healthcare supply chain management. We found that healthcare service are intangible their processes are not fixed to a responsible person and each activity cannot determine the exact sequence. Interpretation and processes sequencing are depended upon input information from a customer or patient in each time. The sequenced process is used one time for one patient. A new sequence will be assigned once a doctor recieves additional information or if a patient is changed. Furthermore, healthcare supply chain is combined with many characteristics of other industries. Therefore, the appropriate knowledge and tools should be selected for answering each problem of healthcare sector. These findings lead to new systematic thinking for healthcare supply chain management.

One masterpiece of our cluster was generated from one problem statement in the area of Thailand healthcare services, the advance in using information technologies in healthcare supply chain still lack of coordinated data standard. This problem can be solved by the creation of unique identification format of drug code and the development of drug information database. "National Drug Code and Database (NDD)" was used as a foundation for the implementation of the Office of Permanent Secretary, Ministry of Public Health's Projects. The projects will be started in year 2013, such as the System Analysis and Design for Drug and Medical Device System Management with Vendor Managed Inventory (VMI) by using Electronic Data Interchange (EDI), the System Analysis and Design of Portal Drug Information Network, the System Analysis and Design for Drug and Medical Device Tracking System in Healthcare Supply Chain (a case of psychotropic substances, addiction, dangerous drug), etc.

Mahidol University
HEALTHCARE LOGISTICS
Research Cluster

Another contribution, hospital business processes and activities blueprint was generated through integrated view. It can be applied to implement in many cases of hospital process re-design, such as supply chain management for saline solution at Ramathibodi Hospital, the prototyping of drug management system between hospitals (such as Ramathibodi hospital and Siriraj hospital) and the Government Pharmaceutical Organization (GPO).

Successful implementations of business process re-design can improve supply chain efficiency and enhance patient safety. For this year 2012, our cluster established the Healthcare Supply Chain Excellence Center (LogHealth). The center mission is to provide healthcare logistics research, academic services, training courses, graduate course, and etc. The ultimate goal is to enhance healthcare service in Thailand.

Professor Dr. Aphichat Chamratrithirong
Institute for Population and Social Research

- Cross Border Migration to Thailand: Population and Social Research Perspective

According to the Thai Census in 2010, there are 2.1 million cross border migrants to Thailand from Myanmar, Lao PDR and Cambodia. Other estimates tend to be somewhat higher. A more recent study where IPSR worked with PATH organization and Health Systems Research Institute, reveals that there are as many as 600,000 migrants just in Bangkok, among these 240,000 of them are recent migrants who moved in only within one year. If the trend of new migrants is continuing and the majority of old migrants who had stayed for more than 2 or 5 years do not leave, which is very likely, within a couple of years, there could easily be more than one million migrants in Bangkok alone.

A study of 3,400 migrants from the three neighbouring countries to Thailand conducted by IPSR in 2010 revealed important settlement patterns of migrants. A large number of migrants reported that they wanted to stay in Thailand for good. In general, migrants stayed in Thailand for an average of six years. Half of them stayed in Thailand for more than five years, with almost 20 % for 10 years or more. The average duration of Myanmar migrants in inland provinces of Thailand is as high as nine years. More than half of migrants from Laos, for example, reported that they wanted to settle down in Thailand. In our MMC/IPSR study, published in Asia and Pacific Migration Journal in 2012, we documented that some permanent settlement of these migrants has already occurred in Thailand. Migrants who have higher wages have the largest family size of 1.6 children and more than half of them still want to have more. Migrants do not just do the three D's jobs for us. They also perform the reproductive function for us. They are bearing children that become part of Thai society. Investment in their children is therefore worthwhile, like investment for our own society.

In Bangkok, among migrants from three neighbouring countries, about 25 % said they wanted to be in Thailand for life. These migrants to Bangkok were found to be stepping stone migrants who did not directly migrate to Bangkok from their countries but migrated from other parts of Thailand particularly the border provinces. The stepping stone process is seen when migrants first come to the border provinces, work for a while then move further to more urban towns or to Bangkok. It means that once these migrants come to Bangkok, it will create some vacuum in the border provinces which will attracts more migrants from outside the country to replace them in the border provinces. The stepping stone suction process will lead to a phenomenal number of migrants.

According to the Ministry of Labour, all migrant registration in Thailand, Bangkok accounts for about 25%. If 25 percent of migrants are in Bangkok and the rest stay in the provincial urban and rural areas of other regions, the total number of migrants in Thailand could reach 4 to 5 millions in the coming years. This is close to 10 percent of the Thai population. These 4 to 5 million migrant workers which may include not only migrants from Myanmar, Cambodia and Laos, but also other countries in the region, will account for about 20% of the Thai labour force. In the future, perhaps one in every five workers in Thailand, will be a cross border migrant worker. This pluralistic society of Thailand is perhaps unavoidable.

Cross border migration can be critical threats to the country. These include violence and crimes, drug smuggling and human trafficking, conflicts against specific nationalities, border disputes, discrimination, and could be war of hatred. All of these can happen if over-nationalism is accentuated issues become political, things are mismanaged or the media become irresponsible and reside in realms of politics. As our faculty of MMC/IPSR put it in their published research on the attitudes of the Thai people toward migrant workers, some Thai have prejudice against displaced persons and especially irregular migrants from Myanmar because they have, as our IPSR colleagues put it, "fear of the unknown". Too often, these fears are not natural amongst our people, but are created by policy makers for political ends or for irresponsible officials for personal gains.

The impact of cross border migration is perhaps one of the most widely researched topics by IPSR academics, mainly because it is the most commonly misunderstood in public discourse. News broadcasts and media reports often portray migrants in a negative light, and IPSR research has shown that around 50% of respondents in the North perceive migrants more as a problem than an opportunity, citing concerns about migration leading to a rise in crime and a threat to personal security. Irregular or unregistered migrants were seen as an even bigger problem and threat. These over anxieties and fears are out of proportion and not in line with the hard facts. It is for this reason that IPSR recently started a programme to work with domestic journalists on these issues through a seminar and verification with fieldtrip programme to migrant communities. What are the sources of these misconceptions and negative perspectives against migrants? These are things that we have to research further and more in depth, and find ways to solve the problem.

Assistant Professor Dr. Parichart Suwanbubbha
Director of Institute of Human Rights and Peace Studies Project

- Reconciliation and Culture of Peace through the Process of Dialogue: a Case of Songkhla Central Prison, Songkhla Province

A research project on 'Reconciliation and Culture of Peace through the Process of Dialogue: a Case of Songkhla Central Prison, Songkhla Province' aims at:

1. Providing both a social and personal 'safe space' for each party (inmates of both national security cases and other criminal cases especially drug addiction) as well as the officers including the inmates relatives to express their feeling, needs, obstacles and limitation of their life.

2. Proposing an alternative way of conflict transformation through dialogue process including understanding about a concept of reconciliation and culture of peace in accordance with prison context.

3. Proposing some findings as a policy for 'the way out' of violence in the prison.

This study is a qualitative research which is composed of a documentary on conflict, violence, reconciliation, culture of peace and a dialogue process as a practical way of conflict transformation and of a participatory action research. A process of dialogue is conducted as a method of research which focuses on the problems of all stakeholders, their full participation of unheard voices and a possibility of social change.

The dialogues were organized for 40 officers, 2 dialogues for the inmates of national security cases (60 persons) and 2 dialogues for the inmates of other criminal cases (70 persons). 1 intra dialogue was done between the inmates of national security cases and of other criminal ones. 1 inter dialogue was performed between the officers and the inmates. Moreover, relatives of both inmates sentenced for national security and of victims of southern violent conflict were in the process of dialogue. Then a follow-up activity through world café dialogue was practiced in order to learn about the result of the prior dialogues. After the first draft of the written report, a focus group dialogue was done in order to hear the comments and suggestions. Finally, the researcher team presented the results of the study to prison community and to public.

The finding response of the 1st assumption is as followed. There are physical violence among the inmates and violence performed by some officers. Through the process of dialogue, the inmate yearned for any just treatment and non violent punishment for their first mistake. Although they committed severe crime, they all still maintain human dignity. Any actions which reduce and destroy their human values are begged to be avoided. At the same time, many officers asked for sympathy due to tension and stress of over work loaded including the effort of drug trafficking into prison. The physical violence may occur by some not all officers. The feeling of unequal treatment between inmates of national security and of other criminal cases which was the second assumption received by officers was expressed slightly. That is, some inmates of national security sympathized their inmates of other criminal ones who likely lack of attention to get more rights of visit, support and be trained comparing to the former group. Through the process of dialogue, the officer offered to put a box of suggestion that the administrator could read and respond.

The reduction of violence is possible through 'a safe zone' of dialogue communication to listen to every party. This is an affirmed finding responding to the third assumption. A process of dialogue focuses on 'human relationship' and a touched feeling and sharing of 'human' nature that includes all feeling of loss, loneliness, fear, despair and struggle for happiness and safety. Both inmates and officers have encountering any different kinds of suffering. It is also true that both sides need to depend on each other therefore listening to each other with loving kindness is necessary to live with empathy. Every party deeply makes an effort to have peace whether each of them understands a definition of peace or not. This is the last assumption of the research. That is, calling for authentic halal muslim food and proper dress from most Muslim inmates of national security cases is considered as their basic human rights. Begging for the just and kind treatment and no more physical punishment from all inmates are the meaning of respecting 'human dignity' of human beings including inmates. These actions go well with the understanding of 'positive peace' which includes harmony originated from the possible basic need, respect of 'human value' without violation of human rights including exercising values of loving kindness, tolerance and forgiveness. The finding confirms that their wishes are based on meaning of the positive peace, although they hardly use a word such as non-violence or peace.The suggestions from this study are the necessary policy to conduct 'dialogue' and to listen from heart to heart in the prison community. Officers should know how to practice and provide a safe space for inmates to share their feeling, needs and problems. This process will be an alternative way of reducing violence and conflict transformation. Corruption is another urgent condition which needs to be eliminated otherwise any structural and physical violence will still happen in the prison context.

* A research project has started in October 2011- December 2012 by The Establishment Project on Institute of Human Rights and Peace Studies, Mahidol University. The research team is composed of Assistant Professor Dr. Parichart Suwanbubbha, Ms. Athitha Kongsab, Associate Professor. Dr. Gothom Areya, Ms. Ngamsuk Ratanasatien, Dr. Ekapan Pinthavanish, Mr. Samart lakatep, Ms.Rachaya Jinoros and Ms. Sukkriyah Bahae.