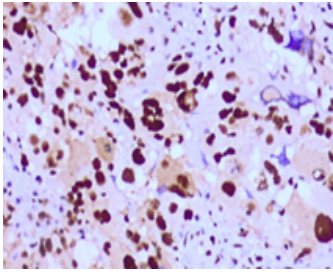
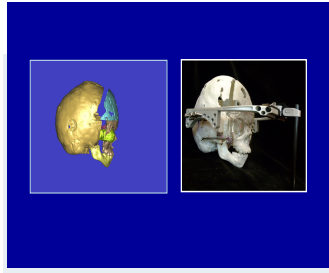


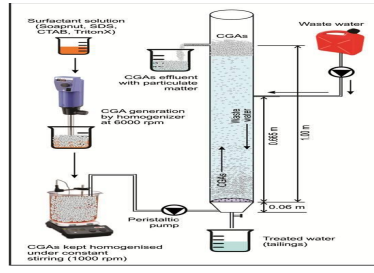
Childhood Cancer:
Genetic Regression



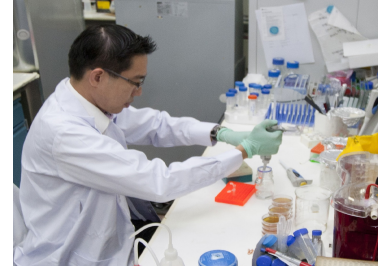
Computer Model
Simulation



Water and Wastewater
Treatment



B. pseudomallei
Detection



Bulletin

Volume 2, 2015



HIGHLIGHTS

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& ACHIEVEMENTS**

**DENGUE ERADICATION THROUGH
COMMUNITY EMPOWERMENT**

IMPROVEMENT OF HVAC SYSTEM

**SUCCESS RESEARCH
STORIES**

MOA BETWEEN UM & HARVARD

**ESTABLISHMENT OF PUBLICATION
DIGITAL FOOTPRINT**

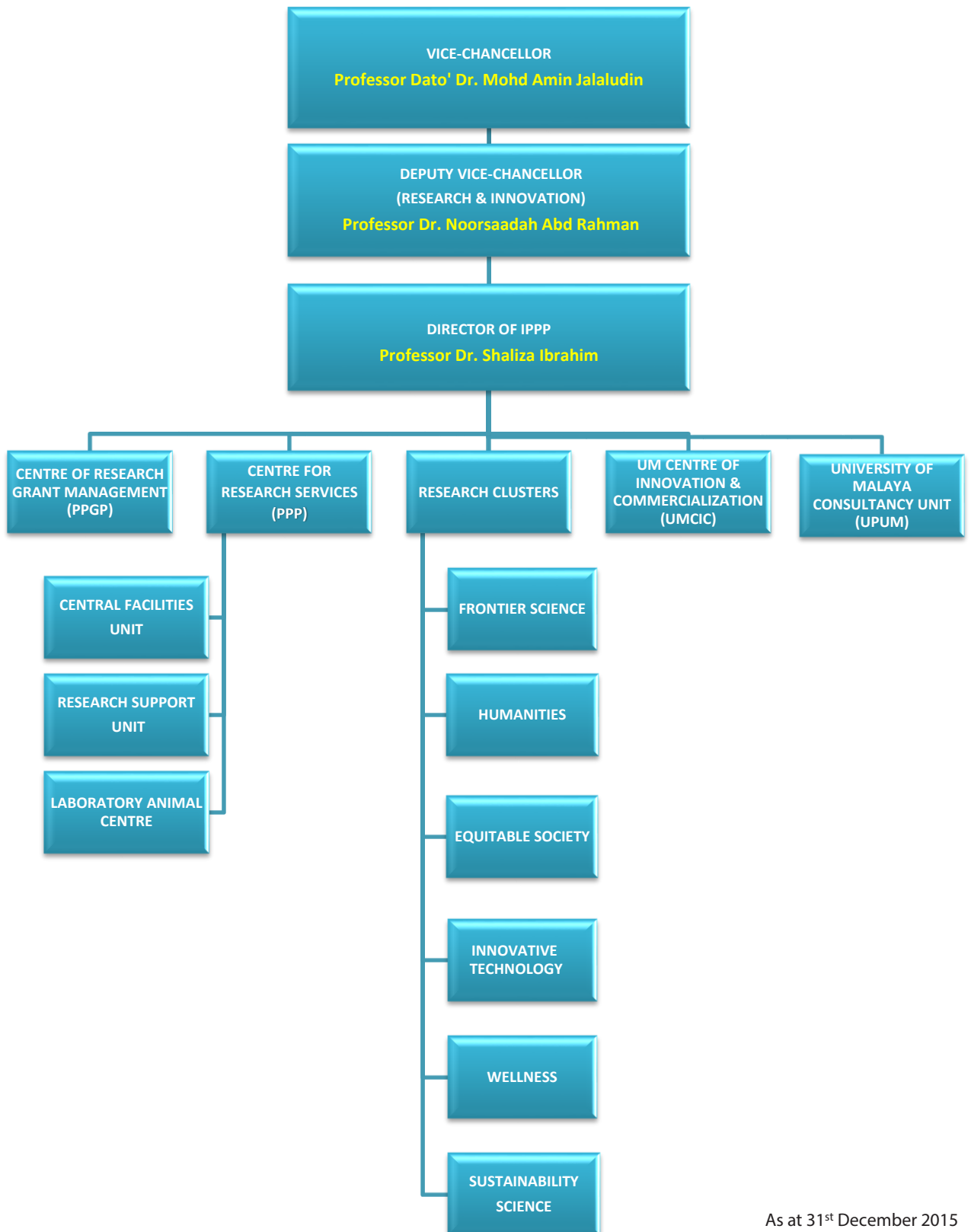
RESEARCH ON WAQF UNIVERSITY

SOARING UPWARDS

RESEARCH OF THE UNIVERSITY OF MALAYA

ORGANIZATION CHART

INSTITUTE OF RESEARCH MANAGEMENT & MONITORING (IPPP)



PREFACES



**Prof. Dr. Noorsaadah
Abd Rahman**
*Deputy Vice-Chancellor
(Research & Innovation)*

Assalamualaikum warahmatullahi wabarakatuh and Greetings,

The University of Malaya has an outstanding reputation and established a very strong record of excellence in fundamental research over the years. Striving towards research excellence, this has enabled University of Malaya to move up its research value chain from pure research to applied and translational research.

I congratulate the editorial committee on their dedication and effort to make the current issue of UMR Bulletin a success. It would not have been possible to put together this bulletin without the tireless efforts of the committee members. Lastly, I wish everyone have a happy and fruitful year in 2016.

Assalamualaikum & Greetings everyone.

I am humbly honored to serve as the Director of IPPP to continue working under Prof. Dr. Noorsaadah who recently held the post Deputy Vice-Chancellor (Research & Innovation) in ensuring the competency of research monitoring and management.

In line with the theme for this issue which is "Soaring Upwards", the editor and team have strived for articles in emphasizing achievements in research for continual improvement by featuring success research stories, memorandum of agreement derived and Top Research Scientist Malaysia 2015 to a new milestone. I hope that this may inspire all of us to gravely continue our research leading to a higher ranking with contribution to the society.

Thank you and enjoy reading!



Prof. Dr. Shaliza Ibrahim
Director of IPPP



Prof. Dr. Thong Kwai Lin
Editor & Director of PPP

This is my last preface for the UMR Bulletin as my term as the Director of the Centre for Research Services, IPPP ends on 31st Dec 2015.

The focus of this issue is on the success stories of UM researchers. How do we define research that is successful? Research that is impactful, innovative, market driven, creates further job opportunities, and engages social community. Its output helps to solve a problem and benefit the community. Success in research requires a strong cohesive team, and as we live in a borderless world, networking with the best minds speeds up the process.

I thank all the contributors and the Research Support Unit team for their tireless efforts. I wish everyone a successful and productive New Year 2016! Keep the flag of UM flying!

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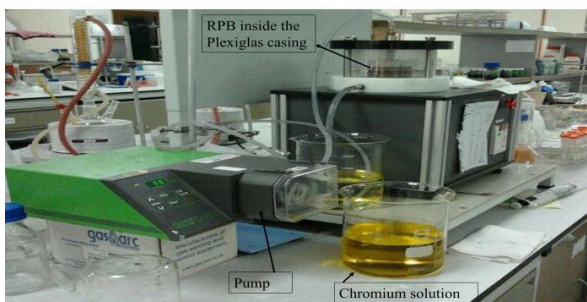
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PROF. IR. DR. MOHD ALI HASHIM

MERDEKA AWARD 2015

In 2015, Prof. Dr. Ir. Mohd Ali Hashim was recognised in the outstanding scholastic achievement category for his contribution in the research of separation processes and water and wastewater treatment. He started his career at the Department of Chemical Engineering, UM in 1980. He has undertaken a number of high impact research programmes, which comprised environmental engineering, separation processes, chemical and biochemical reaction engineering, ionic liquids and deep eutectic solvents: synthesis and applications, and chemical engineering education.



Rotating packed bed contactor for the sustainable treatment of polluted water

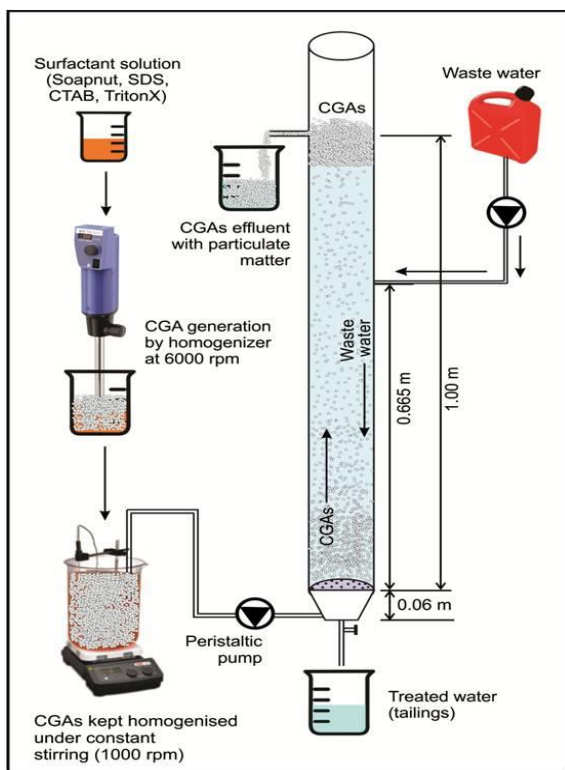
WATER AND WASTEWATER TREATMENT

In 1989, Prof. Ali initiated a pioneering research programme for separation of fine particles from aqueous suspensions using bubble flotation.

In this work, he utilised colloidal gas aphrons (CGAs), which are micron sized bubbles of 25-30 μm in diameter produced by a high speed stirrer in a vessel containing dilute surfactant solution. These bubbles, because of their small size, exhibit colloidal properties. Each bubble is encapsulated in a soapy film and therefore their surfaces are induced with electrical charges. One remarkable quality of the CGAs is that they can be generated in one place and then transported elsewhere by using conventional equipment such as pumps. Moreover, owing to their small sizes, these bubbles ascend slowly in a flotation cell and facilitate attachment of particles to their surfaces. Thus clarification of suspensions such as palm oil fibers from palm oil mill effluent, emulsified oil from oily wastewater, fine cellulose fibers from paper mill wastewater and fine cells from fermentation broth can be efficiently undertaken. Prof. Ali also worked extensively on aerobic and anaerobic treatment of wastewaters and activated sludge systems. These research works have practical implications when they were applied to industry for real time problem solving, such as at Colgate-Palmolive (M) Sdn. Bhd. and Esso Production Malaysia Inc.

Currently, in collaboration with Queen's University Belfast, Prof. Ali is concentrating on an in-situ treatment technology for iron contaminated groundwater in Kelantan where the high iron content of 10 mg/L makes it unfit for domestic and industrial uses.

The technology attempts to eliminate the problem at its origin, and it involves pumping up the groundwater, aerating it with atmospheric oxygen and then recharging it back into the aquifer to create an oxidation zone, where Fe, Mn and other pollutants get oxidized by metal oxidizing bacteria, and eventually get adsorbed on soil particles. The water harvested from this oxidation zone is of superior quality and has lower concentration of iron and other heavy metal contaminants. This technology does not use any chemical, produces very little sludge and is completely sustainable. A pilot plant of 10,000 liter per day capacity has been installed in an iron and manganese contaminated site provided by Air Kelantan Sdn. Bhd. at Kota Bahru, where the iron content in groundwater has been drastically brought down from 9.67 to 0.5 mg/L.

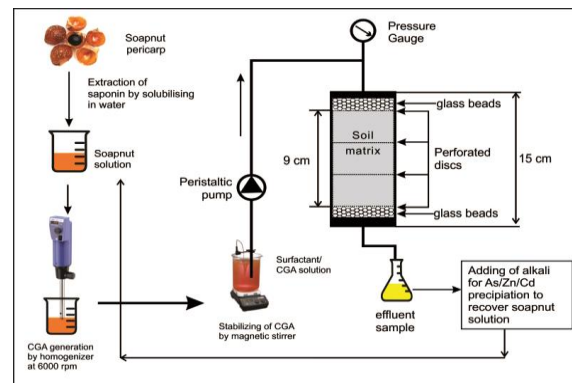


Wastewater treatment by coagulation-flocculation and flotation - CGA flotation setup

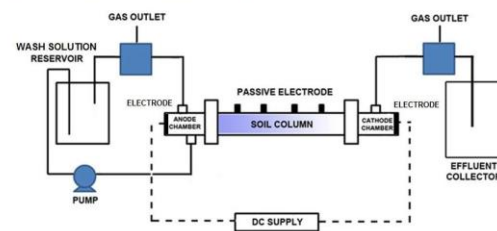
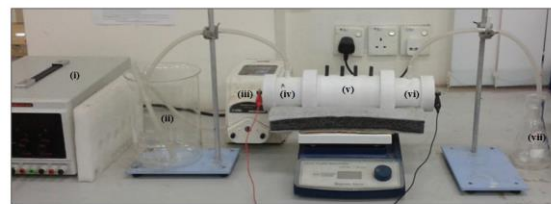
SOIL TREATMENT

Contamination of subsurface soil by toxic and hazardous chemicals is a major environmental problem. These contaminants are often released into the soil from abandoned waste sites, accidental spills, and industrial effluents exposing humans to a range of toxic effects including neurological, hepatic, renal, and hematopoietic disorders. Prof. Ali is currently working with Air Kelantan Sdn. Bhd. and Salcon Engineering Bhd. on an innovative project for sustainable treatment of soil polluted with heavy metal and recalcitrant organic compounds.

Prof. Ali has partnered Queen's University Belfast, RMIT University (Australia) and the University of Southampton to investigate cheap and environment friendly processes of soil washing using electrokinetic treatment and natural biodegradable surfactants. The pilot studies being undertaken have the potential of treating polluted industrial sites in underdeveloped countries in the South Asian region, and this should be a significant achievement considering the scale of heavy metal pollution in such regions.



Soil remediation - CGA



Soil remediation - Equipment setup

URBAN CLIMATOLOGICAL STUDIES

Prof. Ali has studied the energy balance of urban thermal environments. His work has revealed the wide impact of energy consumption in big cities and urban establishments. He discovered that the process of urbanization produces radical changes in the nature of the surface and atmospheric properties of a region. In addition, the interaction between atmosphere and human settlement results in an energy flux and local climate variations between urban and rural areas, as well as for intra-urban areas. It follows that urban climate can be considered as anthropogenic, i.e. a response to urban development. Following this pioneering work, numerous researchers have adopted Prof. Ali techniques in their high impact studies of urban planning, morphology, and climate as well as investigations on the impact of global climate.

SEPARATION PROCESSES

Another major thread of development which Prof. Ali has made a significant impact is in the understanding of the basis of selectivity and affinity phenomenon at the molecular level. To this end, he carried out research in the frontier areas of protein separation and isolation by affinity chromatographic techniques. He identified some fundamental causes of preferential adsorption of certain proteins on various adsorbents. A successful outcome of this project enable engineers and technologists to perform scale-up, design, optimisation and control studies on a given affinity chromatographic system of interest. In this connection, computer software for the modeling and simulation of chromatographic separation processes has been developed. He extended the fundamental ideas of preferential adsorption to characterizing the adsorption phenomena of various heavy metals on numerous biosorbents such as marine algae and fly ash. The idea of using biosorbents, especially dead biomass is a very attractive option because non-living biomass are immune to the toxicity of heavy metals. Immobilization of these biosorbents onto a porous polymeric matrix such as polyvinyl alcohol and calcium alginate not only increases their ability to withstand the harsh conditions often encountered in wastewater treatment but also can be readily applied to existing reactors such as packed bed or fluidized bed. This is an economical investment in comparison to the more expensive physico-chemical methods such as chemical precipitation, ion exchange resins and solvent extraction. The raw materials for biosorbents can be easily sourced since marine algae proliferate abundantly in the oceans. The technology is especially suitable for treating large volumes of wastewater containing low metal concentrations.

Prof. Ali's other contributions in the area of separation processes are notably in the specific areas of microfiltration, chromatographic techniques and crystallization. He studied cross flow microfiltration where the main feed was directed tangentially across the surface of the filter, rather than into the filter, a significant achievement at that time. In addition, in association with the Malaysian Palm Oil Board, he performed in-depth research into the isolation and identification of enzymes and other fine chemicals using supercritical fluid chromatography.

As for crystallization, the research was in the application of the Monte Carlo (MC) technique for analyzing complex problems of attrition and crystal size distribution (CSD). The basic idea behind employing stochastic methods to handle these problems is that it obviates the need to solve the system equations. Moreover, these equations often involve variables that complicate the analysis unnecessarily. In transient CSD analysis, the simulation scheme is attractive due to its simple algorithm. The simulated transient CSD can account for size-dependent growth. It could also incorporate improper mixing conditions under all possible dispersion effects. The agreement among the predicted results and available experimental data confirm the validity of the proposed scheme. In the attrition process, the MC technique offers an alternative to the conventional approach. The technique has also been successfully used together with a physical model for obtaining the fragment size distribution. The distribution provides an account of the volume shape factor dispersion which previous workers often assumed to be a constant.

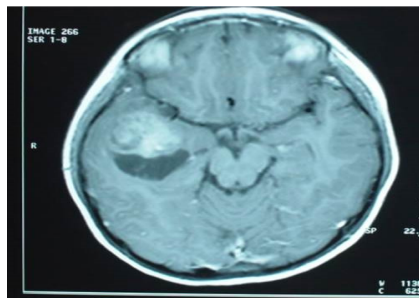


Prof. Ali at the pilot lab of Chemical Engineering Department, University of Malaya

Contact

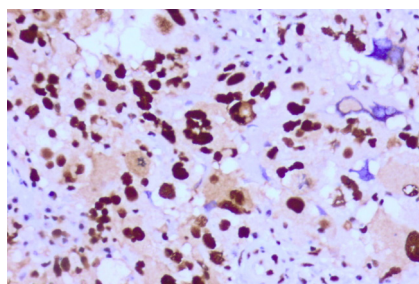
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Undoubtedly, opportunities and potential collaborators are everywhere – all one needs to do is to seize them! Prof. Hany's team was fortunate that Professor Arnold Levine came onboard the team. Professor Levine, who with Lane and Crawford discovered p53 in 1979, is a world-renowned cell biologist. As they approached the halfway mark in our work, Prof. Hainaut and Prof. Hany were invited to Princeton, New Jersey by Prof. Levine (all expenses paid!) to discuss the ensuing direction of this project. He reminded Prof. Hainaut and Prof. Hany that cancer is a complex 'genetic' disease and patients with LFS develop diverse cancers e.g. sarcoma, brain tumours and breast cancer.



Computerised tomography of the brain of the index case showing a large parietal tumour

Thus it was implausible to think that one 'super' SNV could directly impact a mutated TP53 gene, leading to early development of cancer in an affected individual. The team then decided to shift their focus a little; instead towards attempting to understand LFS-related phenomena whilst exploiting data that was already at hand. They chose to address the two most perplexing questions observed in LFS families — heterogeneity and anticipation; the latter a phenomenon where the disease (cancer) appears at an earlier age in successive generations.



Immunohistochemistry of the brain metastasis from the index case showing markedly avid p53 staining

Deep analysis of their WGS data revealed that there was no significant difference in total copy number variations in relation to successive generations or with age at cancer onset. These observations were consistent with Professor Levine's experimental Trp53-deficient mouse model system. Additionally, analysis of 1,771 TP53 mutation carriers from 294 LFS pedigrees revealed no strictly defined anticipation pattern. These observations support an alternative model for apparent anticipation in which rare variants from non-carrier parents may attenuate constitutive resistance to tumorigenesis in the offspring of TP53 mutation carriers with late cancer onset. The team thus proposed a hypothesis, termed "genetic regression" akin to the mathematical concept of regression towards the mean. This hypothesis was a new understanding in the context of the evolutionary tolerability of germline TP53 mutations and provided an alternative view in understanding the phenomenon of anticipation in LFS.

Their paper was published in the journal *Proceedings of National Academy of Science (PNAS)*; Impact Factor 9.67) in October 2014. Subsequently, it was adjudged the Best Scientific Publication at the 9th Annual National Academic Awards organised by the Ministry of Higher Education; a pleasant surprise considering the prize was only made known to Prof. Hany following a chance meeting in the carpark with Professor Noorsaadah, now the Deputy Vice-Chancellor for Research and Innovation. It has indeed been a memorable journey thus far, but their ultimate destination of elucidating the enigma of clinical diversity in individuals with inherited TP53 mutations remains distant. Prof. Hany and team's travels and travails continue.

As the HG19 whole genome database did not have ethnic Malay representation, they obtained help from colleagues in NUS as the Singapore Sequencing Malay Project had WGS data from 96 healthy Malay subjects. The next obvious step would then be to perform functional analyses of these 11 variants with in vitro or perhaps, animal models to interrogate their cancer-driver capabilities.

Prof. Hany was blessed with wonderful students who made up the laboratory team and excellent collaborators who provided the bioinformatics support, mouse modelling data and most importantly, the scientific discourse to ensure successful direction of the project. How did Prof. Hany manage to assemble this brilliant group? Ties with her main collaborator, Professor Pierre Hainaut of IARC began with a random email asking for advice whilst the other collaborators, Professor Arnold Levine and Dr. Chang Chan of New Jersey were introduced to her by an overseas speaker who came to UM for a conference.

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PROF. DR. RAJAH RASIAH

MAKES MALAYSIA & UM PROUD

CELSO FURTADO PRIZE

Universiti Malaya Professor, Dr. Rajah Rasiah was awarded the Celso Furtado prize at the 26th Meeting of The World Academy of Sciences in Vienna on 18 November 2015. The prize carries a cash value of USD15,000 and a gold medal. Named after the famous Brazilian development economist, Celso Monteiro Furtado, it recognizes seminal contributions by a social scientist with a focus on the developing economies.

Although the committee selecting the prize winner was impressed with the broad interdisciplinary coverage of work by Rajah Rasiah in the field of social sciences, the award was particularly presented for his contribution to a better conceptualization of technology, its link with economic development, and how laggard countries can strategize to catch up with the developed countries. In contrast to mainstream conceptualizations that depict technology as a measurable variable that can be conceived in a linear way, Rajah argues that knowledge embodied in technology is a public good that is non-rivalrous and non-excludable. On the one hand, its flow and use cannot be confined to particular individuals, firms and organizations. On the other hand, it can be consumed again and again by individuals, firms and organizations. Also, successful individuals, firms and organizations can creatively transform knowledge reaching them to become more productive so that learning becomes an adaptive rather than simply a copying process. In doing so, Rajah dismissed Robert Solow's framework for estimating total factor productivity where technology is assumed as an exogenous variable, and the subsequent endogenization of technology in the model by Paul Romer. Indeed, Rajah has argued that Alwyn Young's and Paul Krugman's attempt to classify the growth of South Korea and Taiwan as driven by factor inputs rather than productivity is wrong.

The robust conceptualization of technology by Rajah offers latecomer firms the advantage of learning from leaders but in the process creatively appropriating new innovations. In doing so, firms, individuals and organizations through their own actions and the stimulating and conditioning effect of institutions starting at the bottom of a technology trajectory can catch up and leapfrog leaders. Samsung in memories, Taiwan Semiconductor Manufacturing Corporation in logic chips, Posco in steel, and Daewoo in shipbuilding are examples of such successful catch up and leapfrogging.



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Since the evolution of knowledge embodied in technology is a function of competence available in individuals, firms and organizations in which the capacity to transform cannot be established ex ante the diffusion, which is a function of so many influences that include systemic knowledge flows from other individuals, firms and organizations, and from abroad, Rajah devised a typology by taxonomies and trajectories to map capabilities. Consistent with evolutionary postulations, Rajah saw a need to develop such typologies for each different industry, which would evolve with time.

While individuals, firms and organizations are the eventual competitors, institutional change is critical to effect it, and according to Rajah it varies through the different phases of introduction, catch up, maturity and leapfrogging, and differs with industry, time and location. Organizations, such as training centres, science parks, universities and R&D labs not only compete to generate output, such as graduates, trainees and patents, they also address collective action problems faced by individuals and firms. Especially small and medium firms rely extensively on organizations to externalize public good services, such as R&D and training.

While a strong relationship between governments, firms and workers is critical to coordinate knowledge accumulation and commercialization that is essential in the catch up and leapfrogging process, Rajah identified four systemic pillars that require continuous development for supporting this process. Calling it the systemic quad, Rajah encourages governments to focus on the development of the four pillars of basic infrastructure, high technology infrastructure, global integration and network cohesion. While individual components constitute the first two, the third relates to their increased integration into the global economy and the fourth connectivity and coordination between the components of the first two. In addition, governments have the responsibility of coordinating with organizations, the shaping of institutions during each phase, and for each industry.

Both the conceptualization and the application of Rajah's framework of stimulating technological change to support economic development have found traction in policy blueprints. For example, chapter three of the United Nations Industrial Development (UNIDO) Industrial Development Report by UNIDO in 2009 used the systemic quad to capture the link between clustering, technology development and economic performance



of salmon farming and processing firms in Puerto Mont (Chile), automotive firms in Buenos Aires (Argentina) and Jakarta (Indonesia), computer components in Otigba (Nigeria), leather making in Chennai (India), electronics firms in Penang (Malaysia), clothing firms in Phnom Penh (Cambodia), food processing firms in Vientiane and Champasak (Laos), and button firms in Qiaotou (China). Rajah's methodology also became the basis for the United Nations Conference for Trade and Development (UNCTAD) formulating technology transfer programs in 2014. Rajah also led research using this framework and on China and Southeast Asian countries that was funded by the Economic Research Institute of East Asia (ERIA) in 2014, which found host-site institutions and regional integration as important drivers of technology development in the automotive, clothing and electronic industries. In addition, the same framework became the basis for the development of Perak's industrial development plan. His latest work using this conceptualization and methodology is United Nations Development Programme's (UNDP).

PROF. DR. CHUA KEK HENG

BP DETECT- A SERODIAGNOSTIC SYSTEM FOR *B. PSEUDOMALLEI* INFECTIONS

A GOLD AWARD IN BIO TECHNOLOGY ASIA

Burkholderia pseudomallei, the causative agent of melioidosis, is a soil saprophyte endemic to Southeast Asia and Northern Australia. This infection is acquired usually by inhalation, entry through cutaneous lesions and by ingestion and it has the potential for prolonged latency with recrudescence into acute and fulminating fatal infections. The fatality rate in acute septicemic melioidosis can be as high as 65%. Melioidosis is difficult to diagnose clinically due to the wide range of associated symptoms (from benign skin and soft tissue infection to a rapidly fulminant and septicaemia) and the mortality is high among patients with underlying risk factors especially diabetes and immunosuppression. Definitive identification of *B. pseudomallei* relies on the isolation of the bacterium from specimen. The bacterial culture may take up to 4 days and reportedly can have associated problems such as interstrain and medium dependent variability in colony morphology. Thus serological assays appear to be a useful tool for the presumptive diagnosis of melioidosis. In a broader context, serodiagnostic tests can have multiple uses, including: screening for febrile illness (in any patient who had visited endemic areas); patient management (when infections are deep-seated and no specimens are available); monitoring disease activity (investigating the persistence of antibody levels). However, there is lack of a universally acceptable antigen for serodiagnosis of melioidosis.



A prototype of BP Detect was presented at Bio Technology Asia 2014 and a gold medal was awarded to this project.

In their research, Prof. Chua and team employed a rapid and efficient approach to search for an immunogen via a shotgun expression library created from clinically confirmed local virulent isolates of *B. pseudomallei*. After two rounds of immunoscreening with sera from melioidosis patients, several sero-positive clones expressing immunogenic polypeptides were identified and sequenced. After that, these immunogenic polypeptides were then purified and transferred to an ELISA platform for further large scale screening. Experimental screening using melioidosis positive and non-melioidosis sera allowed the identification of two immunogenic polypeptides BPSS1904 and BPSL3130 with diagnostic potential, which demonstrated sensitivities of 75% and 90%, specificities of 90% and 88%, positive predictive value of 79.0% and 79.4%, and negative predictive value of 88.1% and 94.8%, respectively. Moreover, these polypeptide immunogens have several advantages over other forms of immunogen.

The potential immunogenic polypeptides have been combined and used to develop BP Detect which can provide a rapid and accurate serological test for *B. pseudomallei* infection or melioidosis. BP Detect has also successfully secured a gold award in Bio Technology Asia 2014 for Prof. Chua and his team.

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PROF. DR. MOHAMAD MOKHTAR

AWARD FOR ACADEMIC PROMINANCE IN MALAY LANGUAGE 2015



Prof. Dr. Mohamad Mokhtar and the other recipient of the prestigious award

INTRODUCTION

The *Anugerah Tokoh Akademik Bahasa Melayu* (Award for Academic Prominence in Malay Language) is one of the strategic initiatives included in the *Pelan Tindakan Memartabatkan Bahasa Melayu sebagai Bahasa Ilmu di Institusi Pengajian Tinggi* (Action Plan for Malay Language Prestige as a Language of Knowledge in Higher Learning Institutions) for the purpose of acknowledging individual academician's contributions leading toward Malay Language prestige at the *Kementerian Pendidikan Malaysia* (Ministry of Education, Malaysia) level.

This award is also an annual event held in conjunction with the *Sambutan Bulan Bahasa Kebangsaan Peringkat Sektor Pendidikan* (Festival for the National

Language Month at the Education Sector Level). The award presentation ceremony is held during the *Majlis Pelancaran Sambutan Bulan Bahasa Kebangsaan Peringkat Sektor Pendidikan* (Opening Ceremony for the National Language Month Festival at the Education Sector Level). The *Anugerah Tokoh Akademik Bahasa Melayu* was first awarded in 2012.

CRITERIA FOR THE ANUGERAH TOKOH AKADEMIK BAHASA MELAYU

The criteria for this prestigious award are as followed:

- (1) Conducting academic research in the Malay Language and producing publications from the research in format of high impact peer-reviewed materials in Malay Language.

- (2) Supervising thesis in the Malay Language
- (3) Teaching in the Malay Language
- (4) Consultative services
- (5) Acknowledgment and support
- (6) An excellent service record
- (7) Involved in community services

In 2015, one of the two recipients of the *Anugerah Penghargaan Akademik Bahasa Melayu* is Professor Dr. Mohamad Mokhtar Abu Hassan, Director, Academy of Malay Studies, Universiti Malaya.

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PROF. DATO' DR. ZAINAL ARIFF

AWARD OF EXCELLENCE IN COMMERCIALIZATION 2014

Simulasi 3D
Chen Yu Jing
Sebelum pembedahan

Simulasi pembedahan

Sinar bagi pesakit Sindrom Crouzon

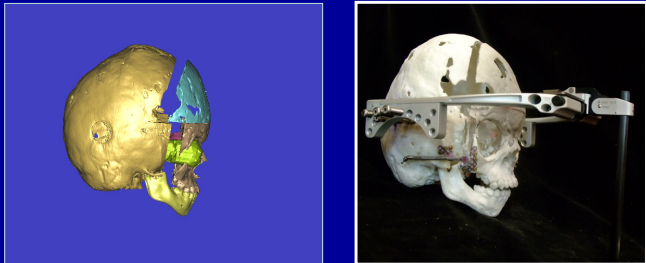
Prof. Zainal's research highlighted in local newspaper

I strongly believe that a strong cohesive team working together with a high respect for each other will always be capable of resolving any intractable clinical problems. The University of Malaya, being a 111 year old university, has acquired much knowledge and wisdom in a diverse range of research areas. Our culture of excellence has groomed many scientists and thinkers who are capable of moving our civilization forward towards better livelihood of our community.

The University of Malaya's craniofacial team has been established to bring together our expertise to solve complex birth defect issues. The team comprises paediatric neurosurgeons, maxillofacial surgeons, otorhinolaryngologists, paediatric chest physicians, paediatric intensivists, anaesthetists, clinical geneticists and ophthalmologists. In 2012, we had a patient with Crouzon's syndrome who had severe facial deformity. This had compromised the patient's breathing which was threatening to damage the eye. At 1 1/2 years old, the patient required an opening on throat (tracheostomy) to facilitate breathing. At that time, the craniofacial team started to move the facial and forehead bone forward to open up space behind the nose for breathing and also to enlarge the eye socket.

The distraction osteogenesis device was used to move the face forward at the rate of 1 mm a day following a surgery to cut the facial, forehead and cranial bone. The computer software system had facilitated the surgical planning. A 3D model was produced to simulate the surgery and bone movement by distraction osteogenesis. A major surgery was carried out to cut the bone and install the relevant device. We were able to move the facial bone 26 mm forward which is the largest movement ever achieved on a child. This success was genuinely due to uncompromised teamwork. Each member of the team had put their heart and mind together to give their very best. In the present borderless world, we should optimize our knowledge and skill to benefit people wherever required. Calamities and conflicts around the world have displaced many people from their homes and denied their privilege to proper healthcare. The Sidr Cyclone in 2007 affected a large population of southern Bangladesh. Many homes were destroyed and very limited source of clean water available. To make things worse, their water wells were also contaminated by arsenic. I had the privilege of joining MERCY Malaysia to deliver the healthcare services at the affected area.

Computer and model simulation of facial bone forward movement



MERCY Malaysia is a local NGO that provides healthcare services across the borders. MERCY was in the scene immediately after the Sidr Cyclone strike to deliver healthcare services and to restore clean water supplies. In Bangladesh, there are about 150,000 unrepaired cleft lip and palate patients. In 2008, we started a cleft lip and palate project to provide primary surgery for these patients. We managed to attend to the needs of about 50 patients during each trip. Later we have extended the same service to Myanmar. The satisfaction that I gained from each humanitarian trip is overwhelming. It is very far beyond the achievements in our daily work where we get our salary at the end of the month. My work in computer aided surgery started in early 2000. I started to discuss with artificial intelligence experts how computer applications could help to improve outcomes of facial bone reconstructive surgery. At that time, I had a patient who had severe injuries in a road traffic accident where he had lost part of his right forehead and eye socket. Together with the neurosurgeon Professor Vikneswaran we started building a prototype of an implant that replaced the missing part using computer. We managed to fabricate a titanium mesh that had been shaped according to the contour of the missing part and placed it on the patient. The patient recovered well from the surgery and optimum accuracy was achieved in reconstructing the missing part.

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From there we further moved on to develop a system for fabricating missing components of skull bone using in-house computer software. In the early stage of the work we were having difficulties in securing funding for the project and we were unable to acquire any grant. However our computer experts managed to assemble a high capacity computer by collecting the condemned CPU and connecting them together. In 2005, we received a gold medal award in Geneva for our product and later we managed to acquire a Techno fund grant for clinical trial and commercialization. Upon completion of clinical trial we extended our services to private and government hospitals nationwide. In 2011, we started a spin off company called the Centre of Biomedical and Technology Integration or CBMTI. We explore further and venture into areas where computer technology can facilitate delivery of healthcare. CBMTI has produced life size human models for the training of neurosurgeons in navigational surgery. The models were sold in Korea, Europe and USA. This innovation was captured by New Scientist and was published on YouTube.

CBMTI currently produces an operating theatre information and processes management system which allows the transmission of live surgery to outside the operating theater and also on line tracking and updating of operating room records. Until today, CBMTI has won seven gold and four silver medals for various products at national and international exhibitions. CBMTI provides full services in bio-modeling especially for medical applications. At present we are marketing seven products for healthcare. The company conducted programmes for schools to introduce 3D printing to school children as a CSR project. Our first project was conducted at Sekolah Menengah Kebangsaan Perempuan Bandaraya. Participation from the school was very encouraging and the programme has successfully created interest among the students.



From right: Prof. Dato' Dr. Zainal Ariff with Vice-Chancellor of University of Malaya, Professor Dato' Dr. Mohd Amin Jalaludin and Prof. Dr. Vickneswaran from Faculty of Medicine during the award presentation ceremony

ASSOC. PROF. DR. LOH SAU CHEONG & PROF. DR. LOO CHU KIONG

iidex 2015 **GOLD** AWARD WINNER

Bio-Feedback Enabled Visual Auditory Simulation Technique for Attention Development among Children (Bio-VASTech)
(Patent Filing No.: PI2014702931)

Learning requires all learners to pay attention to what they are learning. It is therefore particularly important for learners to be on-task whenever learning tasks are performed. Young children with inattention problems will find difficulty in concentrating on a task, do not finish what they start, do not listen to instructions and always lose things. Children with special needs, especially those with Attention Deficit Disorders (ADD) or Attention Deficit Hyperactivity Disorder (ADHD) are especially prone to lack of attention span and thus they are found to be off-task at most time during the process of learning. In the current fast paced society, a method for helping to regulate attention of user is through a biograph employing a biofeedback. Therefore, there exists a need to design a fast, easy to use, simple and yet reliable (objective) process in developing mental calmness and attention among learners so as to promote on-task behavior in learning.

The purpose of this project is to assist normal (3 - 6 years chronological) and special (7 - 12 years chronological) children in fostering their attention so as to promote on-task behavior during the process of learning through the development of a courseware using visual auditory simulation technique that measures attention level of users in real time. This project, which had won a Gold medal in Invention, Innovation & Design Exposition (iidex 2015), is directed by Professor Dr. Loo Chu Kiong from the Faculty of Computer Science and Information Technology, in collaboration with Assoc. Prof. Dr. Loh Sau Cheong from the Faculty of Education.



Certificate of the winning project

The EEG-Biofeedback Enabled Visual Auditory Simulation Technique (Bio-VASTech), is to develop a novel EEG-based biofeedback system (to reach that mind state of being able to concentrate on what user needs to do while staying relaxed) incorporated into Visual Auditory Simulation Technique (VASTech) for objective and sustainable measurement in fostering children's attention so as to promote on-task behavior, and to provide useful feedback signal to adaptively improve the learning process.



Sample tasks for VASTech

VASTech is a technique that adopts the incremental approach. It is developed incrementally (module to module) at the same time blending the multiple intelligences theory with the multisensory approach in forming a holistic approach that helps to develop attention systematically on normal (3 - 6 years chronological) and special (7 -12 years chronological) children. VASTech comprises 3 modules, namely, beginner, intermediate and advance. Each level consists of 5 tasks. Each task differs from one another in terms of its nature of complexity and the time frame needed to complete the task.

The duration for each task is set in an incremental basis, which means that in module 1, task 1 requires 1 minute of engagement, task 2 requires 2 minutes of engagement, and so on. Each subsequent task will advance 1 minute from the previous task. The purpose of setting the short timeframe in an incremental basis is to allow gradual and systematic training of enhancing learners' attention while performing the activities.

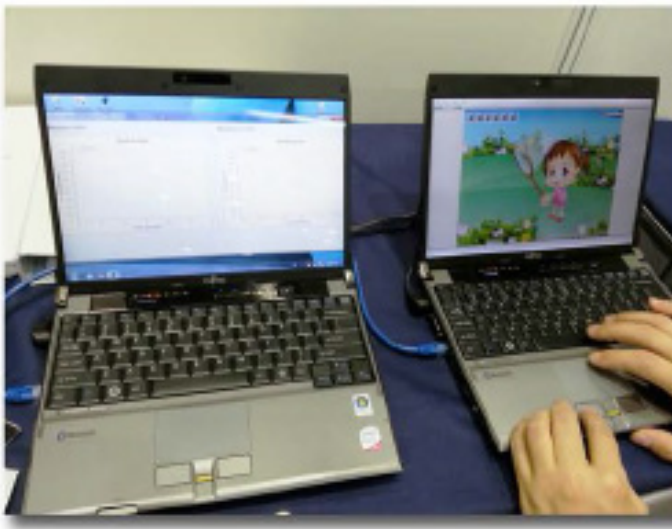
Bio-VASTech is characterised by electroencephalograph signal data of the user. The biofeedback device adopts the development of inexpensive dry sensors which does not require the application of a conductive gel between the sensors and the head, built-in electrical "noise" reduction software/hardware, and a focus on providing an embedded (chip level) solution for signal processing and output, this new technology requires no log in to network like internet, and therefore it gives less hassle to the user and trainer (teacher).



Research assistant is setting up the system

An experiment on brain state classification was set up to distinguish relaxation and attention states. In the first session, in order to induce the relaxation state, a comfortable environment was set up to help the users relax. In the second session, in order to induce the attention state, users were required to complete the visual auditory simulation tasks. EEG signals were recorded by the EEG device and were analysed according to the induced brain states. User will be presented to the next task when user's attention level reached the threshold value.

The present project has the benefit of dual-attention with the use of biofeedback device which helps the user to reach a mind state of being able to concentrate on what he/she needs to do while staying relaxed, coupled with the concurrent engagement of visual auditory simulation technique activities which help to improve attention. Thus this invention enables for dual-attention enhancement and is meant to be implemented for early intervention on mainstream children and children with special needs be it at pre-schools, kindergartens, primary schools, homes, centers, hospitals, and or other institutions.



Research assistant is demonstrating how the system works

In the Education Blueprint of Malaysia, it is aspired that there would be 100% enrolment of school children across different level of schooling in year 2020. Thus, early childhood educators would shoulder a greater responsibility in nurturing these children. The current project enables the nurturing of human capital from very early stage. It helps to develop learners holistically, and to channel their energy in the right way. It enables early childhood educators and special educators to be equipped with intervention skills. In the long run, it improves early childhood care and education in Malaysia.



Young user is engaged on the system

Contact

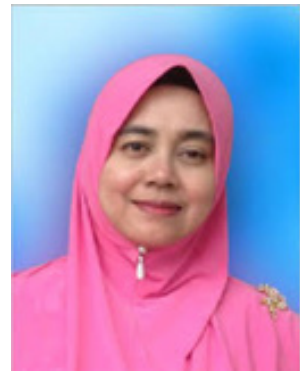
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RESEARCH ON WAQF UNIVERSITY: SOME SHARING POINTS

ASSOC. PROF. DR. SITI MASHITOH



On 17th March 2011, I received a call from the Press Secretary of the then Minister of Higher Education Malaysia, Datuk Seri Mohamed Khaled Nordin, asking me to prepare an article urgently for the Minister regarding the idea of establishing a waqf university in the country. I was quite surprised to receive the call and the message but I tried to be relaxed. I started working on it, and the next day I sent the article. The reason why I managed to finish it so soon was because I had already written a draft about the formation of a waqf university when I was preparing for my sabbatical leave the following September.

The latest used an LRGS grant awarded by the Ministry of Higher Education of Malaysia. Out of the three projects, only the first research which I conducted in my sabbatical days has been completed and the other two are still ongoing. Dr. Asmak Ab Rahman from the Department of Syariah and Economics, Academy of Islamic Studies is the co-researcher for the UMRG projects. She has given strong support for the tasks.

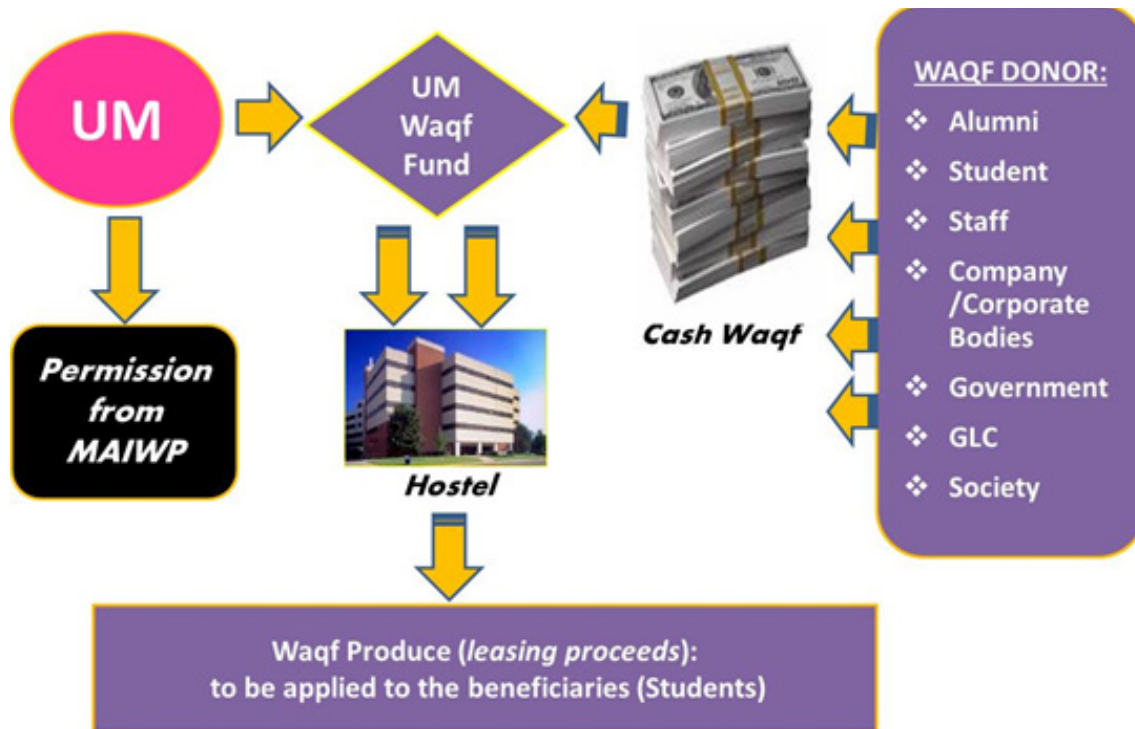
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The call made me realize that the Malaysian Government had also been leaning towards adopting the waqf concept for funding universities and educational institutions. It convinced me that my decision to deal with a waqf university research project was the right one at the right time. From then until now, I have worked on 3 projects related to a waqf university; 2 from UMRG: (i) RG 284-11 HNE: "Towards the Establishment of a Malaysian Waqf University: Conceptualization & Model for Development" and (ii) RP012D-13HNE: "Establishment and Development of a Contemporary Malaysian Waqf University Model: Experience Learnt From Egypt, the UK & the US".



Field Research (Interview) at Merton College, Oxford University with Sir Charles Alexander, The Finance Bursar.



Basic Financing Model For Student Hostel

For the LRGS entitled “Financing, Development & Investment of Higher Educational Institutions Using the Waqf Instrument” (ref: LRGS 2/2013(2) MOE-UM), UKM has been appointed as the Programme Leader, while UM has been assigned to undertake Project No. 2 with the title as stated above and has received an award of RM950,000.00 towards it. IIUM is now working on Project No. 1, and Project No. 3 is being carried out by UKM. The total amount granted by MOHE to the Programme is RM3,989,000.00. The period of the study is from the 1st January 2014 to the 31st December 2016.

There are 10 LRGS research members involved in the project from UM and IIUM. With the strong commitment of the team members, I hope that good results can be produced from the research which could benefit all countries and in particular Malaysia. Sharing sessions were held through several meetings and research talks with several universities and financial institutions in the country towards financing HEIs using the waqf instrument. Besides the current LRGS research, research data from the other two UMRG mentioned before have been used to enrich the discussions and presentations. So far, 4 countries with waqf and endowment universities have been visited, namely Turkey, the UK, Malaysia and Indonesia. Visits to Spain, Morocco, Kuwait, Egypt and Saudi Arabia will be conducted in 2016.

The great experiences of these countries in waqf and endowment financing management will be used in the formulation of a waqf financing model for Malaysia with some modifications to fit with our current requirements (e.g. laws, culture, economy etc.).

Regarding the question of funding HEIs, it is a well known fact that the cost of higher education nowadays is very high. Inflation, increasing numbers of universities and student enrollments, as well as other aspects such as increasing development and infrastructure costs are important factors to consider. This increasing cost of higher education in Malaysia would seem to be part of a global trend which also affects developed countries such as the US and the UK. Thus, our Government is now looking at other alternative sources such as waqf and endowment to reduce the pressure.

In 2007, the Government introduced the National Higher Education Strategic Plan for 2020 (NHEP). It offers more autonomy to public universities to generate their own income by reducing public spending which currently subsidises ninety percent of total expenditure of public universities to seventy percent by 2020. This is in order to reduce the Government’s financial burden in financing higher education in Malaysia.

To meet the challenges mentioned above, our research team strongly believes that waqf can be an alternative source for funding education, including Higher Educational Institutions (HEIs). There are indeed many examples of waqf contributions in this area, historically and in current application. For example, the Al-Azhar University of Egypt, the UK and US endowment universities and also the Turkish Vakif Üniversitesi can be named as some significant HEIs that have flourished due to their waqf properties for centuries.

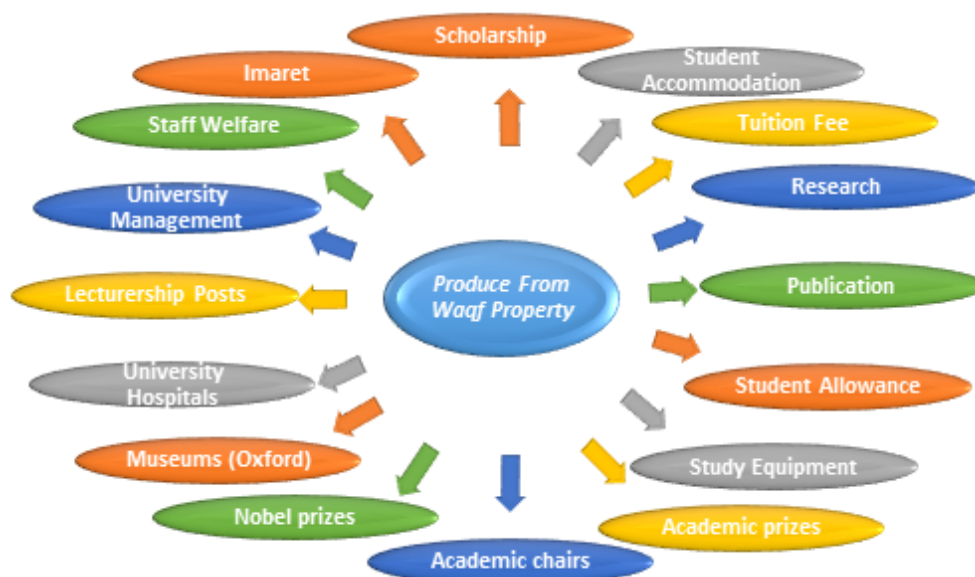
Recently, the Government has launched the Malaysia Education Blueprint (Higher Education) 2015 – 2025, which aims to elevate the country's higher education system. In the 5th Shift (Financial Stability), the Government will be incentivising the creation of endowment and waqf funds besides encouraging contributions to higher education, for example, through the provision of matching grants for HEIs during the initial fundraising period. This transformation system initiative has clearly shown that waqf, as well as endowment, is well accepted by the Malaysian Government.

The current LRGS research, "Financing, Development & Investment of Higher Educational Institutions Using Waqf Instrument", will contribute towards establishing the very significant output of this study, i.e. by suggesting models for financing the Malaysian waqf with contemporary HEIs which are to be adopted by the Malaysian authorities.

The research has won a silver medal (for sub-project no. 1: Concepts & Principles of Financing, Investment & Development of Higher Educational Institutions using the waqf instrument, LR001B-2013B) and a bronze medal (for sub-project no. 3: Models of Waqf Financing, Investment & Development of Higher Educational Institutions: A Study in Malaysia & Some Selected Countries, LR 001C- 2013 B) in Poster Exhibition competition programme at *Minggu Terbuka Akademik (MITA) APIUM 2015* held at the Academy of Islamic Studies, between the 20th and 24th April 2015, and organized by the Research and Development Office of the Academy. Besides producing articles in other publications, an article entitled "Financing universities through waqf, pious endowment: is it possible?" has been published in *Humanomics (Scopus)*, 2015, Vol. 31 Issue: 4.

Lastly, we would like to express our special gratitude to UM and MOHE for awarding us the UMRG and LRGS grants to support the fulfillment of the research tasks.

The most current development is that the research team is working with the university in order to establish this higher institution as a waqf university soon. The effort is being undertaken in line with the decree of His Royal Highness Sultan Dr. Nazrin Muizzuddin Shah Ibni Almarhum Sultan Azlan Muhibbuddin Shah Al-Maghfullah that waqf should be introduced in the UM. We do hope that our dream of "A Waqf University" for UM will become a reality in the near future. Ameen.



Various Distribution Purposes of Waqf Produce

#MSIAENDSDENGUE:

DENGUE ERADICATION THROUGH COMMUNITY EMPOWERMENT

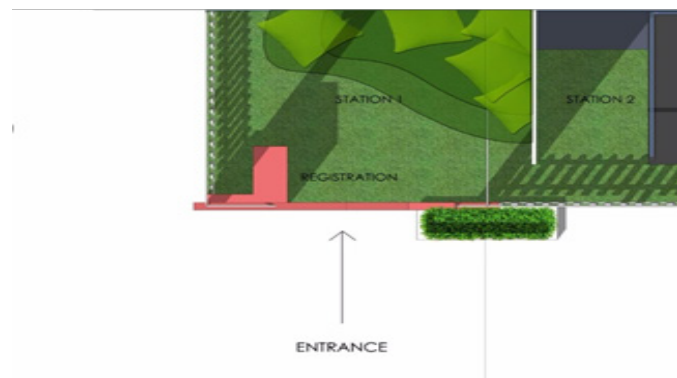
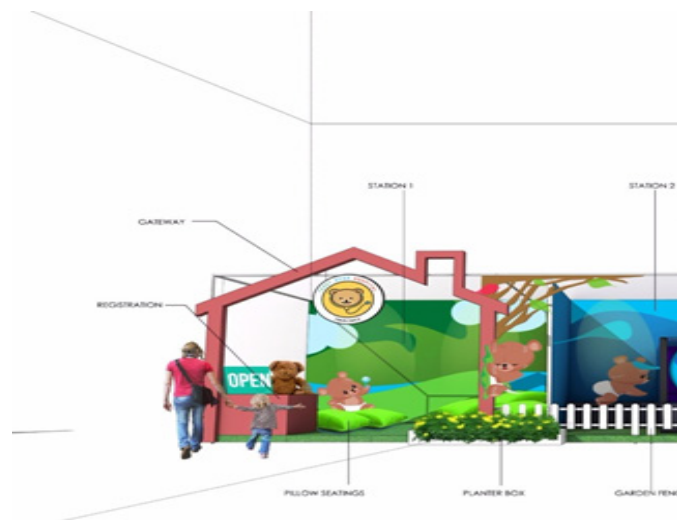
DR. NURSHUHADA ZAINON



Dengue 1-Stop Center at Lembah Pantai

In the wake of dengue endemic that hit the nation worse than ever before since 2014, with triple rise in the mortality as well as the overall reported cases, it was a 'red flag' sign for Malaysia. The first ever-national Dengue Coalition Council comprising academia and NGOs formed to complement the Ministry of Health in the effort to curb dengue. Under an umbrella of #MsiaEndsDengue project, the Department of Quantity Surveying (QS), Faculty of Built Environment, University of Malaya, alongside Islamic Medical Association of Malaysia (IMAM), iM4U, Malaysia Integrated Medical Professional Association (MIMPA), and Pertubuhan IKRAM Malaysia, have been involved not just in creating awareness among public but also in empowering the community in risk reduction program and providing the community with tools and knowledge to play their part.

The first Dengue 1-Stop Center (D1SC) was officially launched in November 2014. Located in the heart of Lembah Pantai, the center was fully refurbished by student volunteers from the Department of QS. It aims to be the central point to educate local communities about dengue. Through this project, the blue ocean collaboration have managed to conduct community empower programs such as Train on Trainers, Seek and Destroy, and even door-to-door facilitation on dengue prevention.



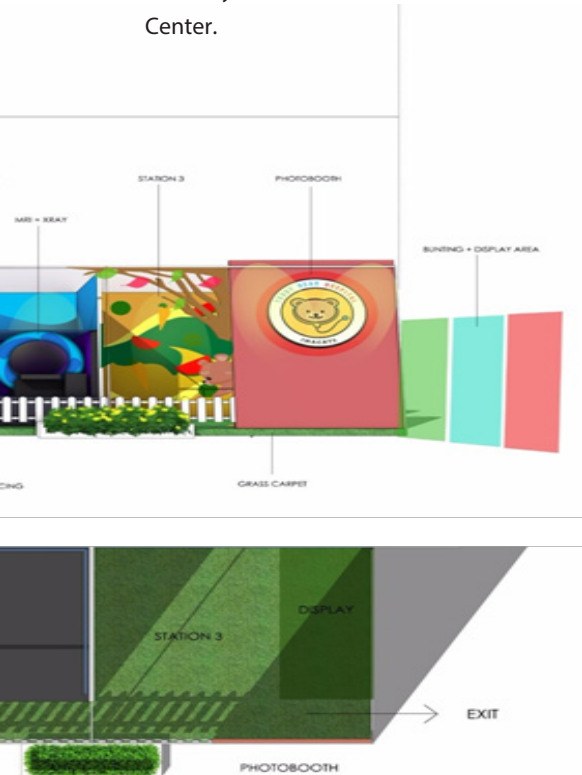
Execution of the Pre-School Dengue Module through the Teddy Bear Hospital program

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Recently, UM and IMAM are also spearheading a dengue awareness project for children. We have established a Pre-School Dengue Module for early learners as a guide for educators, parents or anyone interested in nurturing awareness on dengue among pre-school children. This module incorporates scientific and medical concepts pertaining to dengue laid out as simple and concise as possible. With a support from the UM Community and Sustainability Centre (UMCares), the module's pilot project was successfully carried out by the QS UM volunteers, IMAM, and iM4U at the Tadika Universiti Malaya and Tadika PPR Kerinchi Blok C involving 70 children. The module was introduced for the first time through the Teddy Bear Hospital program during the event of Malaysia Islamic Children Fair 2015 at Shah Alam Convention Center.

The war against dengue is a long term fight against a very complex disease. Led by Dr. Nurshuhada Zainon, the Department of QS has conducted three case studies to identify the factors causing dengue in highrise residential buildings around Kuala Lumpur. In a period of 3 months, 5 visits were conducted at each case studies with the aim to identify the building elements that has become Aedes breeding spots. Building condition assessment were undertaken, which include potential building elements such as roof, gutter, drain, toilet, corridor and other parts that have been identified as areas that are prone to mosquitoes breeding. Interestingly, the emergence of a new factor which are the uneven flat floors and rooftop uniquely occurring in Malaysia and creates avenue for further research to comprehend and support this finding. The final outcome is yet to be published, but at this premature stage, we can already proof that our buildings are 'dengue friendly'. Through this collaboration, we bring a holistic approach integrating science of medicine, entomology, building designs and structures, information technology, as well as the human factor en-route in creating a more sustainable environment with the aim of creating a 'dengueless' nation.



Train on trainers



Execution of the Pre-School Dengue Module at Tadika UM

DR. AU YONG CHEONG PENG

SCIENCEDIRECT TOP 25 LIST OF MOST DOWNLOADED ARTICLES

IMPROVEMENT OF HVAC SYSTEM



The heat, ventilation and air conditioning (HVAC) system is a system that provides proper ventilation and air circulation in a building. A central HVAC system may serve one or more spaces within the building. The service reliability of the HVAC system highly relates to the level of the occupants' productivity and comfort. Heating and cooling system is necessary for a building. A building without a heating and cooling system would be inhabitable. Furthermore, indoor air quality is a significant determinant of healthy life and human's wellbeing, because human spend up to 80% of their lifetime in indoor area.

Improper operation or failure of the HVAC system may lead to poor ventilation which in turn caused Sick Building Syndrome (SBS). SBS develops when the indoor air contaminants build up, and subsequently resulting in poor health and low productivity. The symptoms of illness related to SBS include eye, nose and throat irritation; skin allergy; mental fatigue; headache and difficulty in concentration. The failure to respond to the problem of poor indoor air quality can bring the disastrous impacts towards human health.

MAINTENANCE OF HVAC SYSTEM

In fact, inefficient operation and maintenance of the HVAC system can cause energy wastage, customer complaints, poor indoor air quality and even environmental damage. Thus, the maintenance of the HVAC system must be planned and performed effectively to ensure the occupants' satisfaction towards the system and service. Therefore, this article discusses the maintenance characteristics of HVAC system that affect the occupants' satisfaction.

The central HVAC system may affect the entire building when a failure occurs in any of its component. For example, the cooling of condensed water cannot be done if the chillers breakdowns and hence the entire system cannot convert the hot air into cool air. Furthermore, the maintenance of the central HVAC system is more complicated and difficult because of the system's size and complexity. Hence, to minimise the HVAC system downtime, unplanned maintenance shall be replaced with appropriate planned maintenance strategies.

A study identifies four main planned maintenance characteristics of the HVAC that significantly influence the occupants' satisfaction, namely:

- (a) Skill and knowledge of labourer
- (b) Quality of spare parts and materials
- (c) Response towards failure and downtime
- (d) Skill and knowledge of manager

Poor labourers' skill and knowledge is one of the main barriers in executing an effective maintenance management. When the maintenance labourers fail to maintain the HVAC systems above the acceptable standard, the daily activities of building occupants can be affected. Therefore, they will be complaining on the poorly skilled labourers that lead to the occurrence of uncomfortable working environment. In order to ensure that the maintenance labourers possess relevant skill and knowledge, the qualification of potential labourers must be identified upon employment.

Additionally, quality of spare parts and materials always has an impact towards maintenance performance. Good quality spare parts and materials ensure the building systems to operate effectively without affecting the activities of building users. In contrast, poor quality spare parts and materials will lead to more defects and increases the frequency of breakdown. Hence, the quality of spare parts and materials must be considered to prolong the system lifespan and enhance its operation.

Nowadays, many buildings are solely dependent on the HVAC system to provide air circulation and ventilation. Failure of the system will critically jeopardise the indoor air quality and hence affect the working environment. Therefore, immediate response to the failure and downtime of HVAC system is always requested by the building users.

Meanwhile, introduction of planned maintenance strategies without a skilled manager is unlikely to achieve the result. For example, a skilled manager should be capable in obtaining appropriate maintenance data and analysis, as well as providing training to produce disciplined and knowledgeable maintenance staff. Therefore, the support from skilled manager is highly required to plan, manage, organise, supervise, and monitor the implementation of the maintenance strategies in different aspects. A skilful and experienced building manager is usually able to provide the service as required by the clients and users, above satisfactory level. He ensures all the maintenance tasks run accordingly to prevent failure, additional expenditure and downtime.

PARTICIPATION IN MAINTENANCE MANAGEMENT

The involvement of key participants such as clients, maintenance personnel, and building occupants or users in the maintenance management process is vitally important to enhance the effectiveness of maintenance management and increase the occupants' satisfaction. Providing a communication platform to gather opinions, comments, needs, and issues of the key participants (clients or organisation, management, tenants, and customers or users) can improve the planning of maintenance strategies accordingly. For instance, it is recommended that meeting between the management and clients should be conducted on a weekly basis, whilst meeting between management, clients and tenants be conducted on a monthly basis. In addition, an online feedback system is proposed as a platform for the customers or users to provide feedback, opinion, or complaint about the services provided in the building at any time. The online feedback system requires minimal cost whilst organising meeting requires no cost. Therefore, the commitment and participation of the key participants are necessary in effective maintenance management. Participation provides an opportunity to tackle problems through engagement of the key participants, prioritising their concerns and maximising mutual satisfaction .

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Award presented by the Chair of Design and Development Division, AECT 2014

DR. FARRAH DINA YUSOP

ASSOCIATION FOR EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY AECT 2014 AWARD

University of Malaya's Young Researcher won the Outstanding Journal Article Award at the Association for Educational Communications and Technology (AECT) 2014 convention in USA

Dr. Farrah Dina Yusop, the recipient of the University's prestigious Young Researcher Award 2014 has been awarded the prestigious Outstanding Journal Article Award 2014 from the world renowned Association for Educational Communications and Technology (AECT), USA. The award was presented at the AECT 2014 "Learning, Design, and Technology" Convention held in Jacksonville, Florida, USA on Nov 4-8, 2014. This is the first time a Malaysian has won an award at the USA-based AECT convention.

The award recognizes authors with exceptional articles published in high quality educational technology journals. Additionally, articles nominated should bring insights to either empirical research or theory development in the field of instructional design and were carefully judged by a panel of leading scholars in the field. Dr. Farrah's winning article, "On becoming a civic-minded instructional designer: An ethnographic study of an instructional design experience" was published by the British Journal of Educational Technology (BJET), a tier 1 ISI-indexed journal and one of the most influential journals in the field of educational technology.



THE WINNING ARTICLE

The ethnographic study criticizes the current career-centric approach in educating professionals especially in the field of instructional design that gives more emphasis on developing professionals' technical skills to fulfill the needs of the job. Consequently, this approach has neglected the civic aspect of a profession which is utilization of professionals' skills for public good and better enhancement of the society.

This article thus, aims to demonstrate the feasibility of the Civic-Minded Instructional Designers (CMID) framework for educating Instructional Design and Technology (IDT) professionals who utilize their knowledge and skills to help solve social problems and improve people's lives.

It describes the application of the CMID framework into an instructional design experience of a group of professional designers, and the impact and challenges they faced. Finally it reflects on the critical success factors of the application of the framework as an instructional approach. In their comments, the award panel as well as the international reviewers applauded the article for its novel contribution especially in the application of ethnographic research into the practice of the field which is quite currently under-developed. They also found that the discussion was discursive and gave enough food for thought for the journal readers. Most importantly, the article reveals that the CMID framework works in balancing between a professional's needs for economic gains as well as practical contribution in nation building. It could also be applied in various professional trainings to ensure that future professionals are more sensitive towards the emergent needs of the society.

It was adapted from her PhD work and co-authored with Associate Professor Dr. Ana-Paula Correia from Iowa State University, USA. Her article emerged as the best based on its practical contributions to deepen understanding of the roles of instructional design professionals within larger social contexts. Her article was also one of the nominees for the 9th Anugerah Akademik Negara (AAN) award for the category Journal Publication (Social Sciences and Arts). The paper can be viewed online at <http://onlinelibrary.wiley.com/doi/10.1111/bjet.12112/>.



RESEARCHER'S BIODATA

Dr. Farrah Dina Yusop is currently the Deputy Director of the Curriculum Development Center (CDC) and Senior Lecturer of the Faculty of Education, University of Malaya, Malaysia. She holds a PhD in two fields: Curriculum and Instructional Technology (CIT) and Human Computer Interaction (HCI) from Iowa State University (ISU), USA.

Dr. Farrah actively researches and publishes in the areas of higher education, Web 2.0, social media, educational games and mobile learning. She is especially known for her Civic-Minded Instructional Designer (CMID) conceptual framework which has reframed current ways of educating professionals for the purpose of improving public life. Her works are published in top tier international and Malaysian journals.

Dr. Farrah was the winner of the prestigious University of Malaya's Outstanding Young Researcher Award in 2014 and the Teaching Excellence Award in 2011. She was also internationally recognized with the prominent PEO International Peace Scholarship, USA, the Richard and Shirley Warren Scholarship, USA and the International Association of Research in Service-Learning & Community Engagement (IARSLCE), USA awards in her academic endeavours.

Dr. Farrah has wide experience in the area of teaching and training, both locally and internationally, in the area of educational technology and instructional design. She was previously one of the University of Malaya's e-learning coordinators responsible for managing lecturers' active use of technology for teaching and learning purposes.

Professional-wise, Dr. Farrah serves as an international board member for the Malaysian Online Journal of Educational Technology (MOJET) and the Turkish Online Journal of Educational Technology (TOJET), as well as international advisor for Iowa State University's Learning Design Solutions, a non-profit organization in USA that provides instructional design services to various community partners in the USA. She is currently involved in various trans-disciplinary national and international collaborative research projects involving the Malaysian Communications and Multimedia Commission (MCMC); RMIT, Australia; University of Hawaii, USA; Kasetsart University, Thailand and Centro Escolar University, Philippine.



Dr. Farrah with the plaque received

More information of Dr. Farrah Dina's works can be found at <http://umexpert.um.edu.my/farah>.



Presentation by Dr. Farrah Dina during the convention

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MOU/MOA EXCHANGE DURING UNIVERSITY OF MALAYA RESEARCH CARNIVAL 2015

NO.	UNIVERSITY OF MALAYA	INDUSTRY/ COMPANY/ ASSOCIATION/ FOUNDATION	PROJECT
1	Y.Bhg. Professor Dato' Dr. Amin Jalaludin, <i>Vice-Chancellor UM</i>	Dato' Dr. Mohd Nazlee, <i>CEO, Malaysian Biotechnology Corporation Sdn. Bhd.</i> Mr. Ali Zareh, <i>Managing Director, Paradigm Bioventures</i>	INDUSTRY ACADEMIA COLLABORATION A first project focusing on accelerating the commercialization of in vitro diagnostics for the Bioeconomy, leveraging on UM's new Innovation Incubator.
2	Dr. Ahmad Shuhaimi <i>(Principle Innovator)</i>	Mr. Jaffri Ibrahim, <i>CEO, CREST</i>	GALLIUM NITRIDE ON GALLIUM NITRIDE (GAN ON GAN) The collaboration aims to expand the development of LED epitaxy capabilities, by means of technology and knowledge transfer from University California of Santa Barbara to Malaysia's local university and subsequently Industry. CREST in collaboration with UM shall provide all the needed facilities in expanding the research towards developing the next generation of researchers and engineers skilled in epitaxy, wafer characterization and fabrication to carry the technology from research to commercialization.
3	Professor Dr. Jennifer Ann Harikrishna, <i>Director, Centre for Research in Biotechnology for Agriculture (CEBAR)</i>	Mr. Lim Kim Chai, <i>CEO, KimAgri Corporation Sdn. Bhd.</i>	INDUCTION OF VARIANTS IN CHRYSANTHEMUM SPP FOR FLORICULTURE INDUSTRY A research collaboration between Plant Biotechnology Incubator Unit, CEBAR and KimAgri Corporation Sdn Bhd will co- develop new varieties of Chrysanthemum through the use of chemical mutagens. New plants with attractive flowers will help to spur income generation of this company and remain competitive to the market.
4	Professor Dr. Norzulaani Binti Khalid, <i>CEO, Granatech Sdn. Bhd.</i>	Mr. Lim Kim Chai, <i>CEO, KimAgri Corporation Sdn. Bhd.</i>	TRANSFORMATION PROTOCOL OF CHRYSANTHEMUM PLANTS WITH NOVEL LUCIFERASE GENE USING AGROBACTERIUM TUMAEFACIENS A research contract was awarded to Granatech Sdn. Bhd., UM spin-off company to develop a protocol for producing Chrysanthemum flowers that could glow in the dark with <i>luciferase</i> genes isolated from firefly. This work is also in collaboration with Taylors University.

5	Professor Dr. Rofina Yasmin Othman, <i>Director UM Centre for Innovation & Commercialisation (UMCIC)</i>	Ms. Nurfarini Daing, <i>CEO, MyHarapan, Social Enterprise Ventures</i>	SOCIAL ENTREPRENEURSHIP VENTURES To support the development and growth of UM Social entrepreneurship capacity and to increase cooperation in patent and technology commercialization, training and research related to social entrepreneurship and economic empowerment of communities. The collaboration between MYHARAPAN and UM will support the design and implementation of programmes under a youth social entrepreneur fund.
6	Assoc. Prof. Dr. Chong Wen Tong <i>(Principle Innovator)</i>	Mr. Freddy Lee, <i>Director, Ming Agri International Sdn. Bhd.</i>	TECHNOLOGY LICENSE OF A HYBRID LAMP POST The collaboration will allow commercialisation of UM's Innovation, the Hybrid Lamp Post innovated by AP Dr. Chong Wen Tong from the Faculty of Engineering.
7	Professor Dr. Ir. Noor Azuan Abu Osman, <i>Bioapps Sdn. Bhd. (Principle Innovator)</i>	Dr. Viraj Perera, <i>Executive Director, Platcom Ventures Sdn. Bhd.</i>	HIGH IMPACT PROJECT 2 PROGRAMME FOR AN INNOVATION IN PROSTHETIC DEVELOPMENT The aim is to commercialise and deploy new innovations in Prosthetic technology. Platcom Ventures through its initiative, the High Impact Project 2 program, have agreed to fund the prosthetic project by UM's Spin Off Company, BioApps Sdn. Bhd.
8	Professor Dr. Misni Misran <i>(Principle Innovator)</i>	Mr. Zakaria Jusoh, <i>CEO, MGV Industries Sdn. Bhd.</i>	STABILITY OF SUSPENDED NUTRIENTS FOR MGV INDUSTRIES SDN. BHD. This is a Ministry of Higher Education Public Private Partnership Network or PPRN project for a commercial product innovation designed to mitigate settling out of suspended colloids in product solution after retort process and to offer nutrient encapsulated technology for better nutrient protection and suspension.



Picture taken during MoU/ MoA exchange witnessed by YB The Deputy Minister of Education, Datuk Mary Yap Kain Ching (centre).



MOU exchange between My Harapan Youth Trust Foundation represented by its CEO Nurfarini Daing, and University of Malaya represented by the Dean of the humanities research cluster Prof. Dr. Raihanah Abdullah, witnessed by YB The Deputy Minister of Education Datuk Mary Yap Kain Ching and the Vice-Chancellor Prof. Dato' Dr. Amin Jalaludin (from right to left)

PARTNERING FOR SOLUTIONS CONVERGENCE OF TECHNOLOGIES AND OPPORTUNITIES FOR SOCIAL INNOVATION

Social innovations, social enterprise & entrepreneurships have come into the forefront in Malaysia with increased interest from both the public and private sectors. A social innovation has been defined as a novel solution to a social problem that is more effective, efficient or sustainable than the current solutions. The value created accrues primarily to society rather than to private individuals. Social enterprise & entrepreneurship have also become an integral part of the social innovation process focusing on elements of sustainability and ownership. Playing an important role in the success of social innovations are innovative technologies which maximize impact and provide potential solutions. This certainly signals a convergence between R&D output and social needs.

The University of Malaya has many great examples of social entrepreneurship underpinning social innovation. One of these has been shown recently by Dr. Welyne Jeffrey Jehom from the Department of Gender Studies, Faculty of Arts and Social Sciences. Her UM high impact research (HIR) grant that funded Pua Kumbu Weaving Industry Project was selected as the "Social and Solidarity Economy Best Practice" for Malaysia by Sustainable and Solidarity Economy (SUSY), a European based initiative of Human Resources Without Borders (HRWB), a NGO representing France in a consortium of 23 countries. SUSY's mission is to contribute a coherent and comprehensive response to the universal challenges of poverty eradication and sustainable development.

The community engagement of the Pua Kumbu weaving project has striven to bring the pua kumbu cloth made by the Iban women weavers in Kapit, Sarawak, to new market platforms aiming to enhance indigenous knowledge in empowering and uplifting the livelihoods of these women and their community.



Working as a community producing pua kumbu textile at Rumah Gare, Kapit, Sarawak



Bangie ak Embol, master weaver awarded by United Nation Cultural Heritage as the catalyst of the community project

UM technologies had made an impression at another social enterprise event hosted by MyHarapan's Social Enterprise Ventures in August 2015 at KLCC, focusing on "Innovation with Conscience". An original graduation project submitted to the competition from UM, "The Frequency Selective Hearing Amplifier", addresses a high frequency hearing loss that affects a person's ability to understand speech. A functional inexpensive, portable prototype with a long battery life was developed which has been proven to be working for listeners with mild to moderate hearing loss. The winning entry and a follow-on prototype grant was awarded to the team by SEV. This enables them to further develop their idea for practical application.

University of Malaya's Centre for Innovation and Commercialisation (UMCIC) believes that defining solutions for society through technology innovations should be a major strategy for technology transfer for the university. The prospect of social innovations in the context of ensuring that appropriate technologies developed through public funded R&D could be deployed to society through ventures and enterprises that could ensure their sustainability is very attractive in tandem to doing one off CSR donations. Hence opening opportunities for sustainable social enterprise through uptake of technology innovations is now a major activity at UMCIC.

PARTNERSHIP WITH MYHARAPAN

University of Malaya and Youth Trust Foundation Malaysia (MyHarapan) formally exchanged an MOU during the recent University of Malaya Research Carnival in October 2015. The collaboration focuses on building capacity and empowering social entrepreneurship as well as accelerating patent & technology commercialisation through Social Entrepreneurship Ventures. In the last quarter of 2015, the partnership saw UM pitching its technology at a BAHTERA social innovation event "Innovation with Conscience" and presenting its technologies for the Product Design & Prototype Competition 2015. A highlight of the collaboration for 2015 was the co-hosting of an industry-partnering day. The idea was to create opportunities for matching university inspired technologies with social needs.

SOCIAL INNOVATION INDUSTRY PARTNERING DAY

On 20th October 2015, UMCIC in collaboration with MyHarapan Youth Trust Foundation hosted an Industry Innovation Partnering Day (Series 2) focusing on technologies which support social enterprises or provide solutions and innovations for society. Held at the UMCIC Incubator Lounge, 5th Floor, Research & Innovation Management Complex, 13 technologies were selected, focusing to give the industry an idea of the potential of UM research outputs.

On show was a Community Entrepreneurship Model based on the following topics:

- 1) Banana Tissue Culture (Prof. Dr. Norzulaani Khalid)
- 2) A Methadone Dispensing System for an Intervention Programme (Dr. Mohd. Sarmanni)
- 3) Prosthetics for Children (Prof. Dr. Ir. Noor Azuan Osman)
- 4) Universal Design Technologies: Accessibility for the Disabled (Dr. Naziaty)
- 5) Disposable Ablution Pack (Prof. Dr. Jaffar)
- 6) Talkmate - A simple electronic device that could ease communication for patients with speech disorders (Dr. Nur Azah)
- 7) Vision Aid for Colour Blind People (Prof. Mahmoud Moghavemmi)
- 8) An Oesteo Arthritis Detection Kit (Dr. Lai Wee Khin)
- 9) A Wave Energy Generator for Coastal Communities (En. Norhafizan)
- 10) Smart Walking Cane for The Blind (Prof. Dr. Mahmoud Moghavemmi)
- 11) A Novel Portable Filtration Unit for Supplying Drinking Water (Prof. Dr. Min Jang)
- 12) Batik Waste Water Treatment System for Cottage Industries (Prof. Dr. Shaliza)
- 13) Auditory and Visual Simulation Technology (VASTech) (Assoc. Prof. Dr. Loh Sau Cheong).

Industry and individuals participating in the event included Xeraya Capital, Yayasan Inovasi Malaysia, Malaysian Biotechnology Corporation, Paradigm Bioventures, ScopeGroup, Intellectual Ventures, EPSI and Rave Ventures were given an insight into the opportunities at the University of Malaya for partnering for social innovations, easy term licences for acquiring technology innovations for society, funding social enterprise driven by university technologies and alternative models for CSR funding which focuses on sustainable technology adoption.

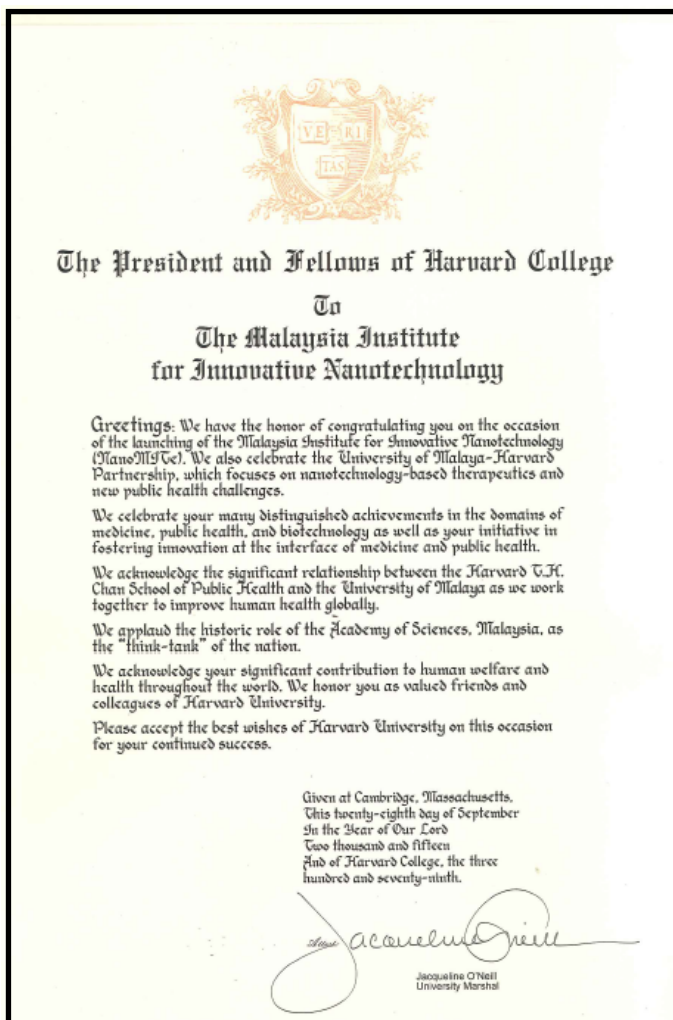
Innovation partnering days in focused technology areas will be held throughout the year including a second session dedicated to social innovations. Updates will be posted on the UMCIC webpage (<http://umcic.um.edu.my>) or on our social media pages. To receive regular technology updates and our upcoming monthly e-newsletter drop us a line at umcic@um.edu.my.

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MEMORANDUM OF AGREEMENT

UM AND HARVARD (TC CHAN SCHOOL OF PUBLIC HEALTH)



28th September 2015 marked another significant research milestone for University of Malaya (UM) through an exchange of Memorandum of Agreement (MoA) was held between UM and TC Chan School of Public Health, Harvard during the 5th Global Science and Innovation Advisory Council (GSIAC) meeting in New York, United States of America. The exchange was executed by the NanoMITE's Program Leader, Professor Datuk Dr. Halimaton Hamdan and Professor Dr. Joseph Brain from Harvard which was witnessed by the Prime Minister of Malaysia, Dato' Seri Najib Razak. Also in attendance was our Minister of Higher Education, Dato' Seri Idris Jusoh, Ambassador of Malaysia to the United States, H.E Awang Adek Hussin, GSIAC members and University of Malaya's Principal Investigator, Professor Dr. Noor Hayaty Abu Kasim.

NanoMITE (Malaysia Institute for Innovative Nanotechnology) is a consortium of distinguished local and international research universities coordinated by Ministry of Higher Education. NanoMITE was first initiated in 2015 and it is an initiative mooted by GSIAC, aimed at building and strengthening local capacity and capability in collaboration with Ivy League universities in nanotechnology to support and sustain Malaysia's economic growth and transition from middle income country to a high-income economy by 2020.

NanoMITE has five flagship programmes focused on five different elements namely energy, wellness, medical and health care, food and agriculture, electronics, devices and systems and lastly environment. Each of these programmes is led by five different Malaysian research universities; Professor Datuk Dr. Halimaton Hamdan from Universiti Teknologi Malaysia leads for energy flagship programme entitled "Nanotechnology enabled efficient generation of renewable energy".

Food and agriculture programme, "Nanotechnology in detection and control of Ganoderma banoinense" is led by Professor Dr. Nor Azah Yusof from Universiti Putra Malaysia while a programme titled "Development of graphene-based Nanoelectro-mechanical Systems (NEMS) sensors and devices" under electronics, devices and systems is led by Professor Dato' Dr. Burhanuddin Yeop Majlis from Universiti Kebangsaan Malaysia. Professor Dr. Abdul Rahman Mohamed from Universiti Sains Malaysia is the principal investigator for the environment programme, "Green technology and nanomaterial applications for the mitigation of greenhouse gases".

Professor Dr. Noor Hayaty Abu Kasim, University Malaya is leading the wellness, medical and healthcare programme entitled "Consequences of smoking among Malaysian population". The programme collaborating partners include Harvard University, Universiti Putra Malaysia, Universiti Sains Malaysia and Universiti Teknologi MARA (UiTM).

This research programme focuses on development of Nano-Aerosol technology for the diagnosis and treatment of smoking-related diseases, namely chronic obstructive pulmonary disease (COPD). COPD accounts to approximately 8.6% of death tolls across the globe as reported by World Health Organization (2012). It has been reported that optimal route for administering interventions is through the pulmonary route. However it requires specific characteristics of the delivery vehicles to optimise the drug efficacy in both pharmacodynamic as well as pharmacokinetics. Therefore, research in various perspectives such as computational design, synthesis of aerosolized nano-delivery system and its pharmacokinetic study are integral in this research. This programme also aims to investigate the health consequences of second hand smoking in Malaysia and to evaluate the intervention programmes to curb initiation of smoking among school going children.

NanoMITe, a five year program is expected to yield not only high impact publications but to nurture young Malaysians talents in the nanotechnology. We are hopeful that the outcome of all the five programmes will promote scholarship and be translated to the society at large.



Memorandum of Agreement (MoA) exchanged at the Global Science and Innovation Advisory Council meeting, New York 28th Sept 2015.



Handing over of the Harvard Greetings by Professor Dr. Joseph Brain, Harvard University to the Prime Minister of Malaysia, Dato' Seri Najib Razak acknowledging the collaboration between Harvard and University of Malaya.

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TOP RESEARCH SCIENTISTS MALAYSIA (TRSM) 2015

The Top Research Scientists Malaysia (TRSM) is an ASM initiative in line with its focus on fostering a culture of excellence in science, technology and innovation (STI). The initiative aims to identify and recognize leading research scientists in Malaysia. The output of this initiative is a TRSM profile that would provide a centralized point of reference on leading scientists in Malaysia along with information on their research areas. The TRSM initiative intends to acknowledge their contributions and showcase the accomplishments of Malaysian research scientists as role models of excellence, mentors to the next generation and leaders to forge ahead with the STI agenda of the nation. For TRSM 2015, three scientists from University of Malaya were among the 13 scientists honored by ASM at a ceremony graced by YB The Minister of Science, Technology and Innovation, Datuk Seri Panglima Madius Tangau on the 31st of October 2015.

The event was held at the Kuala Lumpur Convention Centre in conjunction with 8th ASM General Assembly. The three were Prof. Dr. Nik Meriam Nik Sulaiman, from the Faculty of Engineering, Prof. Dr. Wong Kum Tong from the Faculty of Medicine and Prof. Dr. Rofina Yasmin Othman from the Faculty of Science. The full research profiles of the three outstanding scientists can be viewed at <http://umexpert.um.edu.my>.



From left: Prof. Dr. Nik Meriam Nik Sulaiman, Prof. Dr. Rofina Yasmin Othman, and Prof. Dr. Wong Kum Thong

PROF. DR. ROFINA YASMIN OTHMAN

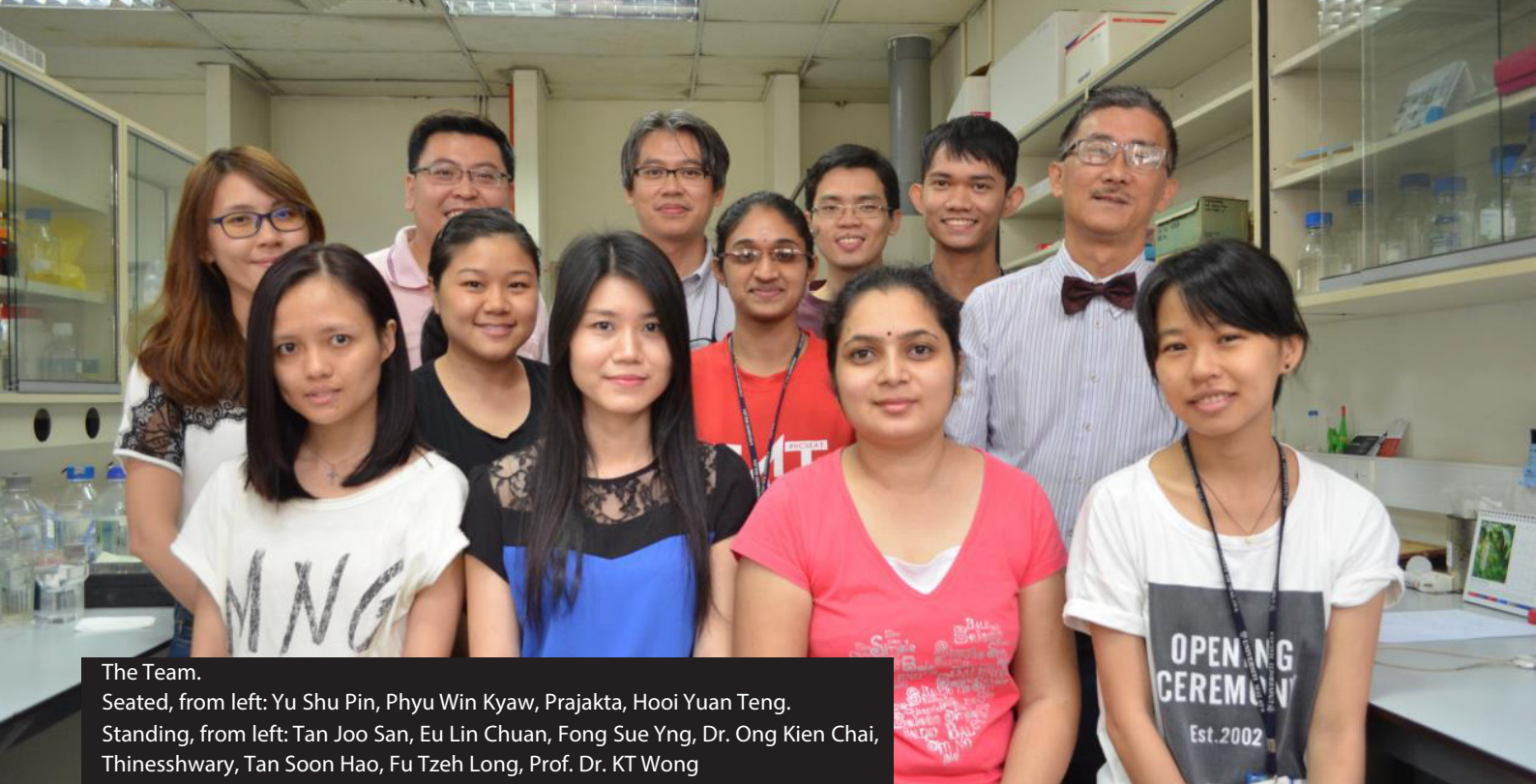


Prof. Dr. Rofina Yasmin Othman graduated with a BSc. in Microbiology from the University of Surrey UK. In 1990, on completion of an MSc at the University of Malaya, Prof. Dr. Yasmin was awarded a Chevening scholarship to pursue a Ph.D. in Plant Virology at the John Innes Institute of Plant Science UK. Since then she has served the University of Malaya and was appointed a full Professor in 2005. The work in Prof. Yasmin's laboratory focuses on the use of molecular tools to try and understand processes in plants and microbes and to search for solutions to questions and problems in tropical agriculture that she believes will ultimately lead to food security and sustainability. She also seeks to explore the potential of both plants and viruses to value add to the economy. This forms the basis of biotechnology, at the core of the bioeconomy, a key driver for Malaysia. Molecular tools have enabled her laboratory to elucidate the diversity of several viruses and microbes, discovering new virus strains and hosts and developing new tools for detection. They have also studied the relationships and diversity of plants such as banana to try and uncover useful genes and traits that could be used for plant breeding. This work extended beyond plants to a very productive collaboration on aquaculture with Assoc. Prof. Dr. Subha Bhassu, successfully showing that technology can transcend the species barrier. The diagnostic tools are now being developed commercially with industry. Central to the research in her laboratory was the development with her collaborators, principally Prof. Dr. Norzulaani Khalid and Prof. Dr. Jennifer Harikrishna, of transgenic technology for the improvement of tropical crops.

The focus was on work in banana, chilli, tomato and other crops that were affected by diseases. With her collaborators she introduced new tools such as recombinant antibodies, peptides and RNAi, developed step-by-step protocols, constructed among the first facilities in Malaysia that enabled work on transgenic crops and built capacity of highly trained PhD/MSc's who work globally. Her team now has transgenic banana and tomatoes ready for field-testing. Her lab was also a pioneer of plant made proteins research in Malaysia that involves the production of recombinant biopharmaceuticals in plants and has patented several applications in banana, tobacco as well as algae. Her lab is also exploring ways on how recombinant plant viruses can be exploited as vehicles in therapeutic applications in animals and humans. It was also important to ensure that there was a conducive environment for research and hence her interest in biopolicies, biosafety and bioethics. Prof. Yasmin is also committed to developing the safety framework that would allow the application of these technologies and this has led to her appointment to the National Biosafety Board. The research experience enabled her to be part of drafting the National Biosafety Act, and while at a four-year secondment at the Ministry of Science Technology & Innovation Malaysia (MOSTI) helped to translate bioeconomy, biosafety and bioethics policies to implementation. Her work has attracted international attention and her labs are now part of a consortium funded by the Bill and Melinda Gates foundation to try and solve the disease problems in East African highland bananas, a staple food crop in that region impacting millions. Prof. Yasmin has also been profiled by Scientific American World View: <http://www.saworldview.com/wv/profiles/yasmin-othman/>

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The Team.

Seated, from left: Yu Shu Pin, Phyu Win Kyaw, Prajakta, Hooi Yuan Teng.
 Standing, from left: Tan Joo San, Eu Lin Chuan, Fong Sue Yng, Dr. Ong Kien Chai, Thinessshwary, Tan Soon Hao, Fu Tzeh Long, Prof. Dr. KT Wong

The Team. Seated, from left: Yu Shu Pin, Phyu Win Kyaw, Prajakta, Hooi Yuan Teng. Standing, from left: Tan Joo San, Eu Lin Chuan, Fong Sue Yng, Dr. Ong Kien Chai, Thinessshwary, Tan Soon Hao, Fu Tzeh Long, Prof. Dr. KT Wong

PROF. DR. WONG KUM THONG

Prof. Dr. Wong Kum Thong obtained his medical degree from the University of Malaya. Later he qualified as an anatomic pathologist actively involved with clinical diagnostic services after obtaining the Master of Pathology and Membership of the Royal College of Pathologists, United Kingdom. He also received training in the subspeciality of neuropathology in the Addenbrooke's Hospital, Cambridge University, UK, and Massachusetts General Hospital, USA. His research interest started after he joined the Department of Pathology, Faculty of Medicine, University of Malaya, and was focused on infectious disease pathology especially infections involving the central nervous system. Based on his work on human Nipah virus infection, he obtained his Doctor of Medicine degree from the University of Malaya.

He has published numerous peer-reviewed papers in many ranking scientific journals including Lancet, New England Journal of Medicine, PNAS, American Journal of Pathology, Journal of Virology, Archives of Neurology, Journal of Neuropathology & Experimental Neurology, and Neuropathology & Applied Neurobiology. To date his H-index is 24 and he has more than 2,400 citations in ISI journals. He has collaborated with many international researchers from USA, France and Japan, and worked in the Pasteur Institute, France and the CDC, Atlanta, USA. As part of the University of Malaya Nipah investigation team he has won the Mahathir Science Award in 2006 and the inaugural Merdeka Award in 2008.

The output from his research team that includes Dr. Ong Kien Chai (PhD, Dept. of Biomedical Sciences) has contributed to further understanding of the pathology and pathogenesis of virus infections in the central nervous system. This applied science and translational medicine work is important to help combat the many emerging and reemerging pathogens that continue to cause considerable morbidity and mortality in vulnerable human populations. The team strongly believes in capacity building to produce more scientists who are well grounded in research methodology and scientific thinking that will in turn create the necessary environment for future scientific discoveries, and who knows, future Malaysian Nobel laureates even.

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PROF. DR. NIK MERIAM NIK SULAIMAN

Armed with a bachelor's degree in chemical engineering, Prof. Dr. Nik Meriam decided to pursue her knowledge by following a Master's course in environmental pollution control. She believes the exposure on wide ranging topics covering all three media of air, water and land pollution and supported by interrelated knowledge on meteorology, legal, microbiology and legal aspects will give her a comprehensive outlook on what one may like to dub as the 'Environment of Things'. Looking forward to the future, sustainability science features as an important aspect of Prof. Dr. Nik Meriam research endeavour. Some notable achievements of Prof. Dr. Nik Meriam are summarized below:

- Air Environment – The Air Pollution Research Unit (APRU) was established in 1996 together with the environmental scientists from the Chem. Dept. and the atmospheric physicist, focusing on the characterization, meteorology and modelling of air pollutants. They become the first group of Malaysian scientists to set foot in Scott Base, Antarctica to conduct sampling and characterization of Antarctic air, which subsequently lead them to take part many environmental projects as consultants for the Department of Environment. Prof. Dr. Nik Meriam and her research group is currently participating in the UM Grand challenge program on urbanization.
- Water Environment – Together with world renown membrane scientist Prof. Tony Fane of UNSW, Prof. Dr. Nik. Meriam applies the membrane technology to studies on palm oil effluent, fruit juice clarification and natural rubber latex. Her research on natural rubber latex led her to a contract research endeavor with Sime Darby Bhd. and won in a gold award at ITEX Geneva in 2005.
- Environmental strategy – Management of environmental issues with the proper strategy goes beyond technology fixes. Prof. Dr. Nik Meriam was involved in Cleaner Technology since 2000 through collaboration with the Danish agency (Danida) and was appointed as the technical expert for the implementation of this approach with 100 pembatiks in Kelantan and Terengganu. This work was supported by the EU-Asia link project with the Malaysian-German Business chamber as a co-partner in Malaysia.



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DR. NADER – CREATOR OF “RESEARCH TOOL”

A DIGITAL FOOTPRINT FOR PUBLICATION BY USING TWITTER

ABSTRACT

Twitter is a social media site created in 2006 that gives ones a chance to share quick thoughts using not more than 140 characters in a post. It's a great way to share ones current research, publications and links to achieve maximum publicity. Twitter assist researchers to stay current with the literature and new developments in your field of interest. One suggestion for improving your research impact and visibility by utilizing Twitter.

INTRODUCTION

As citation counts and H-indexes become increasingly important to external funding councils and internal promotion procedures within universities, disseminating research output by utilizing social media getting more attention [1]. Twitter is a microblogging social media site with 560 million active users, and more than 1 in 40 researchers are reportedly active on the site [2]. Scientists who use Twitter tend to be effusive in their praise. Twitter helps them stay on top of news in their field, find new publications, get speaking and publishing opportunities, communicate their research directly to the public, and perhaps most importantly is to find potential collaborators.

In fact, among researchers who use social media in a professional context, 83% declared Twitter is the most useful tool they use [3]. According to Dr. Melissa Terras from the University College London Centre for Digital Humanities, “Prior me to blogging and tweeting about the paper, it was downloaded twice (not by me). The day I tweeted and blogged it, it immediately got 140 downloads” [1].

TIPS TO COMPOSE A TWEET

- Get started: Make a profile on twitter.com and personalize your account, add a photo to your “avatar” and add a short bio.
- Use hashtags (a word or phrase that follows the “#” sign, like #ResearchTools or #ResearchVisibility) to make your tweets more interesting to others and thus more likely to be shared via a retweet [4].
- Find your community on Twitter: Find users who share your interests and to “follow” them to start receiving their updates.
- Create a list to follow: “@” people, journals, programs; “#” hashtags for topics of interest [5].



Picture credited to: <https://about.twitter.com>



- Attach a photo to your tweet: When composing a tweet, click the “Add photo” camera icon and upload a picture from your computer.
- Measuring your success: Twitter’s Analytics dash board can help you measure the success of your outreach efforts.
- Contribute to the online community by joining discussions.
- Keep Tweets conversational: Be professional without being overly formal.
- Post regular content, e.g. links to hot papers, events and conferences.
- Retweet. By promoting other members of your community you are raising your own profile at the same time [6].
- Using the “retweet with comment” feature.
- Avoid being a “Science Kardashians”: Keep your K-Index and MK-Index below than 5 [7].

CONCLUSION

Twitter can be used as a professional tool to efficiently stay up-to-date in ones area of research which useful to broadcast views and interests, disseminate research outputs, provide links to your research articles, send out information about conferences being organized and circulate interesting reference relevant to specific research interest.

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IPPP Central Lab Facilities

NO	FACILITIES	MODEL	TEST/SERVICES
1	Nuclear Magnetic Resonance (NMR 270 MHz)	Bruker AVANCE 270 MHz	<ul style="list-style-type: none"> 1H, 13C & others
2	Nuclear Magnetic Resonance (NMR 600MHz)	Bruker AVANCE III 600MHz	<ul style="list-style-type: none"> 1H, 13C & others 2D analysis
3	Sample Preparation (SEM)	--	<ul style="list-style-type: none"> Carbon/Gold Coating Chemical Treatment /CPD
4	GCMS	Agilent Technologies	<ul style="list-style-type: none"> Compositional Test (Scan & SIM Mode using RTX-5 Column) Compositional Test (Own Column)
5	Confocal Laser Microscope	Leica Tcs Sp5 II	<ul style="list-style-type: none"> Fluorescent Imaging Life cell imaging (Time Lapse)
6	Field Emission Scanning Electron Microscope (FESEM)	Quanta FEG 450, EDX-OXFORD	<ul style="list-style-type: none"> Imaging Compositional
7	Surface Area Analyzer (BET)	Micromeritics ASAP2020, TRISTAR II 3020 Kr	<ul style="list-style-type: none"> Surface Area Pore Volume Pore Size Distribution
8	Differential Scanning Calorimeter (DSC)	Perkin Elmer (DSC-8000)	<ul style="list-style-type: none"> Heat Flow Analysis Specific Heat Capacity (Cp)
9	Simultaneous Thermal Analyzer (STA)	Perkin Elmer (STA-6000)	<ul style="list-style-type: none"> Weight Loss Melting Curves
10	Dynamic Mechanical Analyzer	Perkin Elmer	<ul style="list-style-type: none"> Creep Test
11	Particle Image Velocimetry (PIV)	Dantec Dynamics Nano L135-15piv	<ul style="list-style-type: none"> 2D Imaging 3D Imaging
12	DNA Sequencer	Applied Biosystems (3730xl DNA Analyzer)	<ul style="list-style-type: none"> DNA Sequencing
13	Real Time PCR	Applied Biosystems Quantstudio (12k Flex Real Time PCR System)	<ul style="list-style-type: none"> Quantitative PCR Application
14	LCMS	Agilent Technologies	<ul style="list-style-type: none"> Qualitative
15	UHPLC	Agilent Technologies	<ul style="list-style-type: none"> Qualitative
16	Ellipsometer	J.A. Woollam M-2000	<ul style="list-style-type: none"> Change in Polarization Optical Constant Film Thickness
17	Rheometer	TA Instruments DHR-2	<ul style="list-style-type: none"> Viscosity Viscoelastic
18	Tensiometer	Attension Sigma 700	<ul style="list-style-type: none"> Surface and Interfacial Tension Powder Wettability

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UNIVERSITY OF MALAYA

ACADEMIC CALENDAR FOR SESSION 2015/2016

SEMESTER I				
Introduction week	1 week	01.09.2015	-	06.09.2015
Lectures	9 weeks*	07.09.2015	-	06.11.2015
Mid-Semester Break	1 weeks*	07.11.2015	-	15.11.2015
Lectures	5 weeks	16.11.2015	-	18.12.2015
Revision Week	1 week*	19.12.2015	-	27.12.2015
Examinations Semester	3 weeks*	28.12.2015	-	16.01.2016
Semester Break	5 weeks*	17.01.2016	-	21.02.2016
TOTAL	25 weeks			
SEMESTER II				
Lectures	7 weeks	22.02.2016	-	08.04.2016
Mid-Semester Break	1 week	09.04.2016	-	17.04.2016
Lectures	7 weeks*	18.04.2016	-	03.06.2016
Revision Week	1 week	04.06.2016	-	12.06.2016
Examinations Semester	3 weeks*	13.06.2016	-	02.07.2016
TOTAL	19 weeks			
SESSION BREAK/SPECIAL SEMESTER				
Semester Break	9 weeks*	03.07.2016	-	04.09.2016
	or			
Lectures and Examinations	8 weeks*	03.07.2016	-	28.08.2016

*Public holidays:

Malaysia Day (16th September 2015)

Aidil Adha Public Holiday (24th September 2015)

Maal Hijrah (14th October 2015)

Deepavali Public Holiday (10th November 2015)

Prophet Muhammad's Birthday (Maulidur Rasul) - (24th December 2015)

Christmas Public Holiday (25th December 2015)

New Year Public Holiday (1st January 2016)

Chinese New Year Public Holiday (8th & 9th February 2016)

Labour Day (1st May 2016)

Wesak Day (21st May 2016)

Nuzul Al-Qur'an (22nd June 2016)

Aidifitri Public Holiday (7th & 8th July 2016)

National Day (31st August 2016)

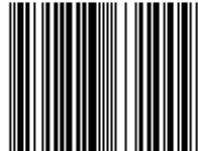
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