

UMR BULLETIN

VOLUME 18, NO. 1 2018

WELL DONE, UM!
ONE OF THE
WORLD'S TOP 100
UNIVERSITIES

2019
#87

2018
#114

2017
#133

2016
#146

2015
#151

THE AWARD WINNING
SMARTMF

PROJECT
ROSE

THE CONCEPT OF
MACHINOEKI

UNIVERSITY OF MALAYA ACADEMIC CALENDAR

2018/2019

Orientation week	1 week	03.09.2018	-	09.09.2018
Lecture	8 weeks	10.09.2018	-	04.11.2018
Mid-semester break	1 weeks	05.11.2018	-	11.11.2018
Lecture	6 weeks	12.11.2018	-	23.12.2018
Revision week	1 week	24.12.2018	-	01.01.2019
Examination	3 weeks	02.01.2019	-	20.01.2019
Semester Break	4 weeks	21.01.2019	-	17.02.2019
Lecture	8 weeks	18.02.2019	-	14.04.2019
Mid-semester break	1 week	15.04.2019	-	21.04.2019
Lecture	6 weeks	22.04.2019	-	02.06.2019
Revision week	1 week	03.06.2019	-	09.06.2019
Examination	3 weeks	10.06.2019	-	30.06.2019
Semester Break	1 week	01.07.2019	-	08.09.2019
Lecture & Examination	3 weeks	01.07.2019	-	25.08.2019

Nuzul Al-Quran (2 June 2018)
 Hari Raya Aidilfitri (15 & 16 June 2018)
 Hari Raya Haji (22 Ogos 2018)
 National Day (31 August 2018)
 Agong's Birthday (9 September 2018)
 Maal Hijrah (11 September 2018)
 Malaysia Day (16 September 2018)
 Deepavali (6 November 2018)
 Prophet Muhammad's Birthday (20 November 2018)
 Christmas (25 December 2018)
 New Year (1 January 2019)

Thaipusam (21 January 2019)
 Federal Territory Day (1 February 2019)
 Chinese New Year (5 & 6 January 2019)
 Labour Day (1 May 2019)
 Wesak Day (19 May 2019)
 Nuzul Al-Quran (22 May 2019)
 Hari Raya Aidilfitri (5 & 6 June 2019)
 Hari Raya Haji (11 Ogos 2019)
 National Day (31 August 2019)
 Maal Hijrah (1 September 2019)

PREFACE

Alhamdulillah, we did it. We broke into the Top 100 Universities rank in the QS World Ranking 2019, going from 114 to 87, two years ahead of schedule. Thank you all for all the hard-work and dedication given make this “dream” a reality for UM.

For the QS Work Ranking measure, the criteria used are academic reputation (40%), employer’s reputation (10%), citation-per-faculty (20%), faculty-to-student ratio (20%), international faculty (5%) and international student (5%). Thus, kudos to UM’s researchers who contributed directly about 20% to the ranking advancement through the citation-per-faculty measure and indirectly, 40% through academic reputation. Having reached the top 100 target, we now have to set our targets to maintain the position or ever better the position in the future. This, again, requires hard-work of high impact output and outcome from our researchers. I am certain, UM’s staff have what it takes, in all aspect, to lead us be one of the best universities in the world. This is certainly not an easy task, considering the trying times, economically, included for us to sustain our research activities. However, our researchers have shown resilience in sustaining their research activities such as obtaining funds from external sources or being creative in running projects that are “high efficient, high impact.” We, at research management, will try our best to continue to facilitate your journey in all ways. May UM continue to soar and be the pride of Malaysia in higher education.

Prof. Dr. Noorsaadah Abd Rahman
Deputy Vice-Chancellor

Bismillah, June is such a blessing month. Besides celebrating Eid Mubarak, we are proud to see UM has leapfrogged into the World’s Top 100 universities! We have moved up 27 places from last year’s result and ranked at 87. Thanks to the continuous support and effort from all UM community, this increment has placed us in the top 9% of 1,011 institutions ranked by QS in its latest release. And UM is now within the top 1% of approximately 26,000 universities globally. We managed to hold our identity as the country’s leading university in research, teaching, learning and the empowerment of the community, in line with the nation’s aspiration to create a higher education system that ranks among the world’s leading higher education systems and enables Malaysia to compete globally. Of course, we will never be able to do so without your contributions.

The UM Research Bulletin Vol 18 No 1, 2018 showcases many interesting projects that focuses on outputs with impacts. Though funding is limited, we believe that our researchers will be able to challenge themselves to compete for external funds, and establish great network and collaborations with researchers around the world.

Thank you.

Prof. Dr. Shaliza Ibrahim
Associate Vice-Chancellor

EDITORIAL MESSAGE

It is our pleasure and honour the publication of UMR Bulletin volume 18. It has been 18 years since University of Malaysia started the biannual magazine to highlights researches of UM communities. Over the next year, we have introduce several improvements to UMR Bulletin to make it more exciting and informative to our readers. This year, UMR Bulletin started issue no. 1 of volume 18 with new editorial teams. We have carefully curated 10 research articles for the current issue of UMR Bulletin covering topics in science and technology to humanities and arts, as well as multidisciplinary community-based research project.

The multi-awards winner SmartMF project highlights the novel wireless health monitoring non-invasive medical device capable of real-time assessment of body cholesterol level, dengue severity risk, biophysical activities and HIV management. Another new innovation from medical forefront is the Project ROSE, a pilot cervical screening programme to be make screening more inclusive and friendly to the women in Malaysia. The Japanese Machinoeki project in Taiping, Perak highlights the collaborative efforts between local government and business communities to strengthen local township management. The UM eco-campus blueprints showcase new solutions to sustainable water, waste, energy, transportation, education and governance managements, bringing the living labs to the forefront in the campus.

Finally, we are very pleased to share that UM has been ranked at 87 of world top 100s university by the prestigious QS World University Rankings. Well done, UM.

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ALTERNATIVE SWEETENERS FOR BETTER MAINTENANCE OF ORAL HEALTH

ASSOC. PROF. DR. FATHILAH ABDUL RAZAK, FACULTY OF DENTISTRY

ASSOC. PROF. DR. MD YUSOFF MUSA, FACULTY OF SCIENCE

Sugar is a common household ingredient that adds sweetness to enhance the taste of foods. Simple sugars like glucose served as an instant substrate for the generation of energy and are often taken by athletes as instant energy booster prior to sports events. Sucrose which is commonly consumed in the human diet is a disaccharide that is easily available in the granulated form. It was reported in 2014, that the world population of seven billion people consume roughly 165 million tonnes of sugar, that is 23 kg per capita on average and four billion of these consumers are concentrated in Asia. Despite its important stance in the food industry, excess consumption of sucrose has been implicated with several health conditions including diabetes and dental caries.

Dental caries is closely associated with the presence of acid-producing bacteria present in the oral biofilm or dental plaque. The bacteria *streptococci* that dominantly inhibits dental plaque, ferments sugars

such as sucrose, fructose and glucose to acidic by-products. When plaque is thin and the matrix structure is loose, the acids produced are neutralised by the oral fluid which contains components that can buffer the pH back to neutral. However, if oral hygiene is neglected, the development of dental plaque is enhanced and the biofilm matures with the increase in biomass to become thick and compact. Under such condition, the buffering action of the oral fluid becomes restricted leading to the accumulation of plaque acids. Prolong exposure of the enamel surface to a critical acidic pH of about 5.5 makes the enamel structure vulnerable and demineralisation occurs.

Maturation of the plaque matrix is greatly influenced by the availability of sucrose. The breakdown of sucrose to simple sugars produce energy high enough for *streptococci* which are equipped with the enzyme known as glucosyltransferase, to catalyse the formation of extracellular polymer matrix (EPS) dextran from the glucose residues.

SUGAR SUBSTITUTES OR ALTERNATIVE SWEETENERS HAVE BEEN SHOWN TO BE EFFECTIVE IN REDUCING THE PREVALENCE OF DENTAL CARIES



Alternative sweeteners commonly consumed in Malaysia

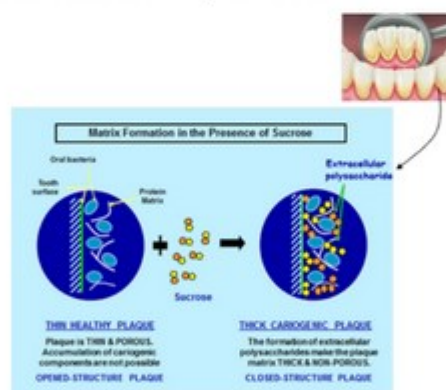


Dextran is sticky with low solubility. This makes the biofilm non-penetrable to oral fluids and increases its biomass to become thick and gelatinous, such as the sensation felt on the tooth surface after eating a bar of candy.

Sugar substitutes or alternative sweeteners have been shown to be effective in reducing the prevalence of dental caries as many of them are not metabolised to acid by plaque bacteria. Sweeteners that are categorised as carbohydrate origin include sugar alcohols such as sorbitol and xylitol while, non-carbohydrate sweeteners like saccharin, aspartame and sucralose are chemically synthesised. Sorbitol is the most frequently used non-sugar sweetener. Although sorbitol could be adapted by oral microorganisms as a substrate, studies showed no increase in caries upon its frequent use. Non-carbohydrate sweeteners are usually calorie-free high-intensity sweeteners, which accounts for their popular usage in slimming and healthcare products.

A mixed suspension of *Streptococcus mutans*, *Streptococcus mitis* and *Streptococcus sanguinis* represents the microbial component of plaque biofilm in the study. Saliva-coated glass beads (sGB) were used as substratum for the adhesion of bacteria and formation of plaque. Biofilm formed on sGB at 3hr and 24hr represented the early and established-plaque models. Saliva coating of the substratum is important as components from the saliva serve as adhesion receptors for bacterial attachment to the tooth surface during the early phase of plaque formation. The biofilm models were then exposed to three doses of the sweeteners (10%), introduced at three intervals to simulate the exposure of plaque to sugar during three consecutive food intakes. The influence of exposures to the sweeteners and sucrose on bacterial colonisation of sGB and biomass production were assessed by turbidity and scanning electron microscopy (SEM), respectively.

Higher rate of bacterial adherence was determined during the early compared to established phases of plaque formation. Comparative to the sweeteners, sucrose showed a 40% increase in bacterial adherence and produced 70% more plaque mass. In other words, sucrose was highly utilised by the bacteria to produce EPS that contributes to the increase in plaque biomass. Bacterial counts and SEM micrographs exhibited absence of matrix in all the sweetener-treated biofilms at the early phase of formation, indicating aspartame, acesulfame, erythritol, stevia and xylitol that are present in the respective sweeteners are non-utilisable as substrates for EPS formation by plaque bacteria. At the established phase, however, the presence of matrix was detected but at significantly lower degree compared to that shown by sucrose.



The presence of additional constituents in the sweeteners such as corn and cellulose powder may have contributed to this effect because when bacteria is forced to grow under an unfavourable growth condition, which in this case the absence of carbohydrate, they may adapt by producing enzymes that allows them to oxidize environmental energy sources in order to survive. Thus, it can be concluded that alternative sweeteners promoted the formation of oral biofilm with lighter mass which improves its porosity, an important characteristic of a healthy plaque. Hence, alternative sweeteners as effective antiplaque agents are suggested.

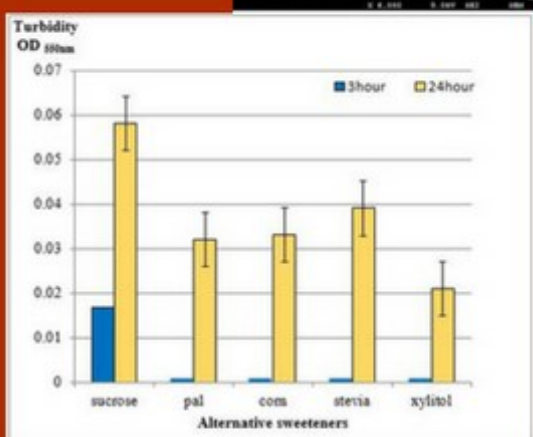
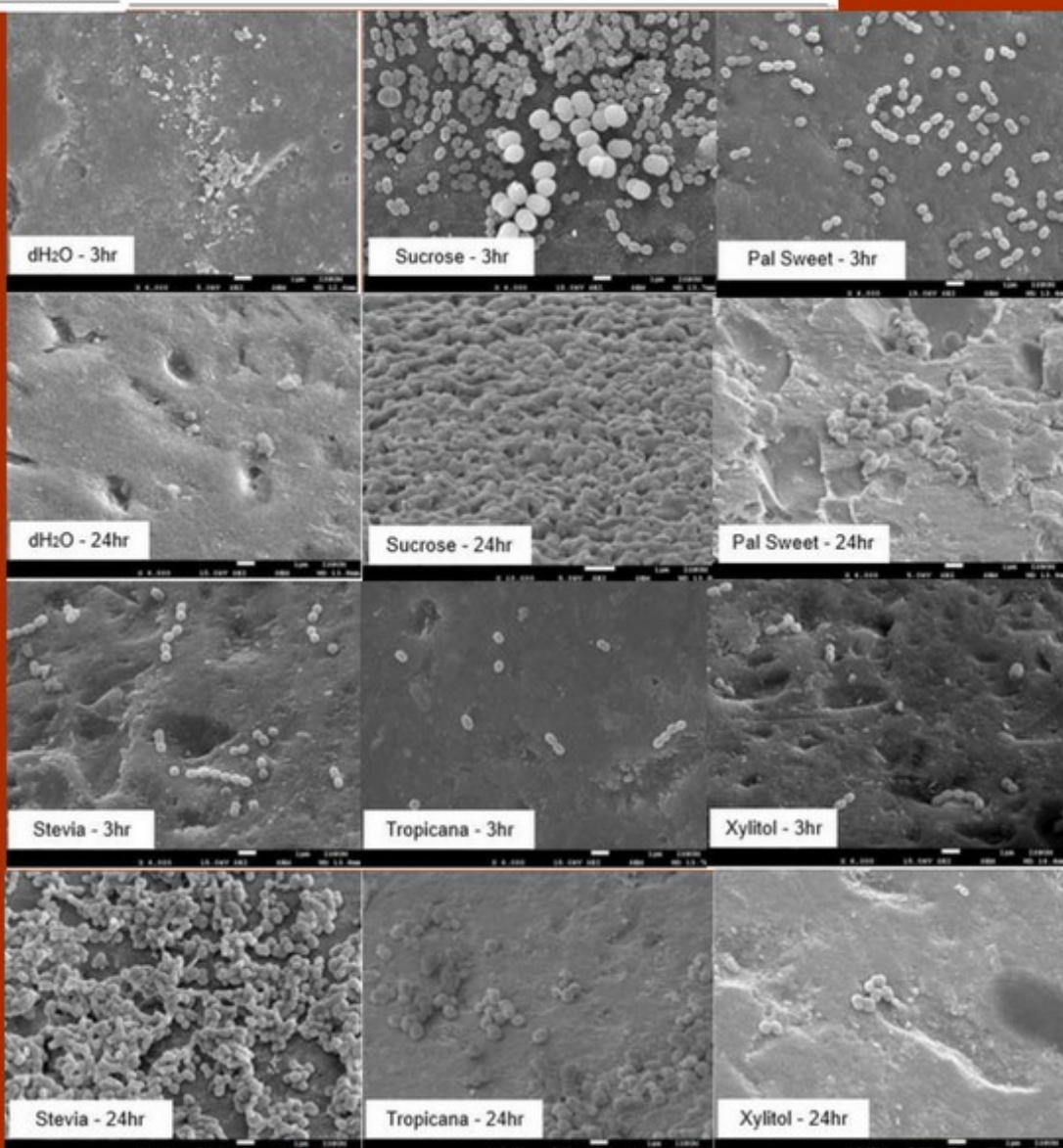
Test sweeteners	Presentation	Constituents
Sucrose	Powder	Pure sucrose
Xylitol	Powder	Pure xylitol
Tropicana Slim®	Powder	Aspartame Sorbitol Corn powder
Pal Sweet®	Powder	Aspartame Acesulfame Lactose
Equal Stevia®	Powder	Stevia Erythritol Cellulose powder

Test sweeteners	Reduction of plaque mass (%)	p value	Cariogenic potential with reference to sucrose Equivalence (Tukey's test)
Pal Sweet®	57	0.0034	Stevia>Trop Slim=Pal Sweet>Xylitol
Tropicana Slim®	55	0.0076	
Equal Stevia®	42	0.0193	
Xylitol	68	0.0002	

Percentage of reduction in plaque mass was determined in comparison to sucrose. Equal Stevia® showed the highest cariogenic potential with respect to sucrose.

Composition list and manufacturer's information of the sweeteners used in the study.

Adherent streptococci to sGB at 3hr and 24hr-plaque following exposures to Pal Sweet®, Equal Stevia®, Tropicana Slim®, xylitol and sucrose. The presence of plaque mass following treatment with Equal Stevia® indicated that it was utilisable by plaque bacteria to produce extracellular matrix. sGB was used as substratum to simulate saliva-coated tooth surface in the oral cavity. (6000x)



Levels of plaque mass produced in early and established plaque models following three doses of Pal Sweet®, Tropicana Slim®, Equal Stevia®, xylitol and sucrose.

GOOD QUALITY NEIGHBOURHOOD FACILITIES ENCOURAGE SOCIAL TRUST AMONG URBAN VILLAGERS

ASSOC. PROF. DR.
NORHASLINA
HASSAN,
FACULTY OF ARTS
& SOCIAL
SCIENCE

One of the major challenges faced by cities in Malaysia currently is sustainable development particularly in the realm of the social aspect. Seen from this perspective, the urban villages in Kuala Lumpur deserve special attention given their historical importance to the development of the capital city and the country. Previous studies have shown that social integration in urban villages is strong due to their long-standing cultural background. However, it is uncertain if this strong social integration is sustainable as the physical environment of these villages continues to deteriorate due to the lack of proper maintenance and upgrade. Yet, most researches seem to agree that good quality physical environment encourages interaction which leads to social trust.

Social trust is confidence one has towards another. It is the amount of trust individuals have in people they know as well as in people they do not know, including trust in formal institutions. Works of literature have revealed a strong correlation between satisfaction of neighbourhood facilities and social capital and social trust through social interaction and engagement. Shared spaces in this context, in the form of community infrastructures or public spaces with unrestricted access, increase the chance of people encountering one another while going about their daily activities and interaction. Researchers also noted that positive face-to-face interaction provides the possibility of generating trust between racially and culturally heterogeneous communities. Perception of neighbourhood quality similarly, is proven to correlate with social interactions and trust through the sense of attachment. Undesirable, inadequate and poorly maintained facilities increase the reluctance of their use. Residents will not feel safe and comfortable if their neighbourhood facilities are not well maintained, forcing them to find services elsewhere, thus lowering residents' opportunity to meet, interact and generate social trust.



Figure 1: Satellite view of Salak Selatan New Village
Source: Google Earth, 2017



Figure 2a Poor and dilapidated housing conditions



Figure 2b From left: Chinese Primary school and an old health facility



Figure 2c Marketplace

The relationship between satisfaction towards neighbourhood facilities and social trust were examined in a study conducted in the area of Salak Selatan New Village (SSNV), one of the urban villages in Kuala Lumpur. SSNV was established in 1953 with an area of 121.4 hectares. It is located in the southern part of Kuala Lumpur and flanked by high-end townships such as Bandar Tun Razak, Taman Desa, and Salak Selatan (Figure 1). Years of independence, however, have not lifted this area from physical decay (Figure 2a). With no proper development plan, ad hoc developments and illegal constructions flourished, causing yet another set of problems for future planning and development. Against the generally poorly maintained and old public facilities (Figure 2b), the Chinese primary school sticks out as an exception. This is perhaps attributable to the Chinese tradition of commitment to education. Funds are raised through school activities and donations from parents and private organisations to maintain the school, standing it out compared to other facilities. Another prominent facility is the marketplace (Figure 2c). Placed under the Kuala Lumpur City Hall, the marketplace is well-maintained and relatively clean. Informal interview with the locals revealed that villagers especially the elderly frequent the marketplace making it a common meeting point.

Two types of social trust: communal trust and leadership trust, were measured in the study. Communal trust refers to the relationship among villagers such as recognition, trust, helpfulness and close ties whereas leadership trust refers to trust in local government, housing associations, and the Village Development and Security Committee (JKKK). In the structural model analysis (Figure 3), it can be seen that satisfaction towards neighbourhood facilities and length of stay are significant determinants of communal trust. This suggests that while communal trust significantly determines social trust, residents' length of stay plays an important role in reinforcing it. This is because long-term villagers have acquired a sense of attachment and belonging and are more tolerant of their physical and social environments.

Leadership trust, however, is not influenced by the residents' length of stay; no matter how long a villager has resided in a village, trust in the authorities will diminish if he is not satisfied with the neighbourhood facilities. Thus, to promote leadership trust the governing bodies must improve neighbourhood facilities as it is in the public interest and an investment in their neighbourhood.

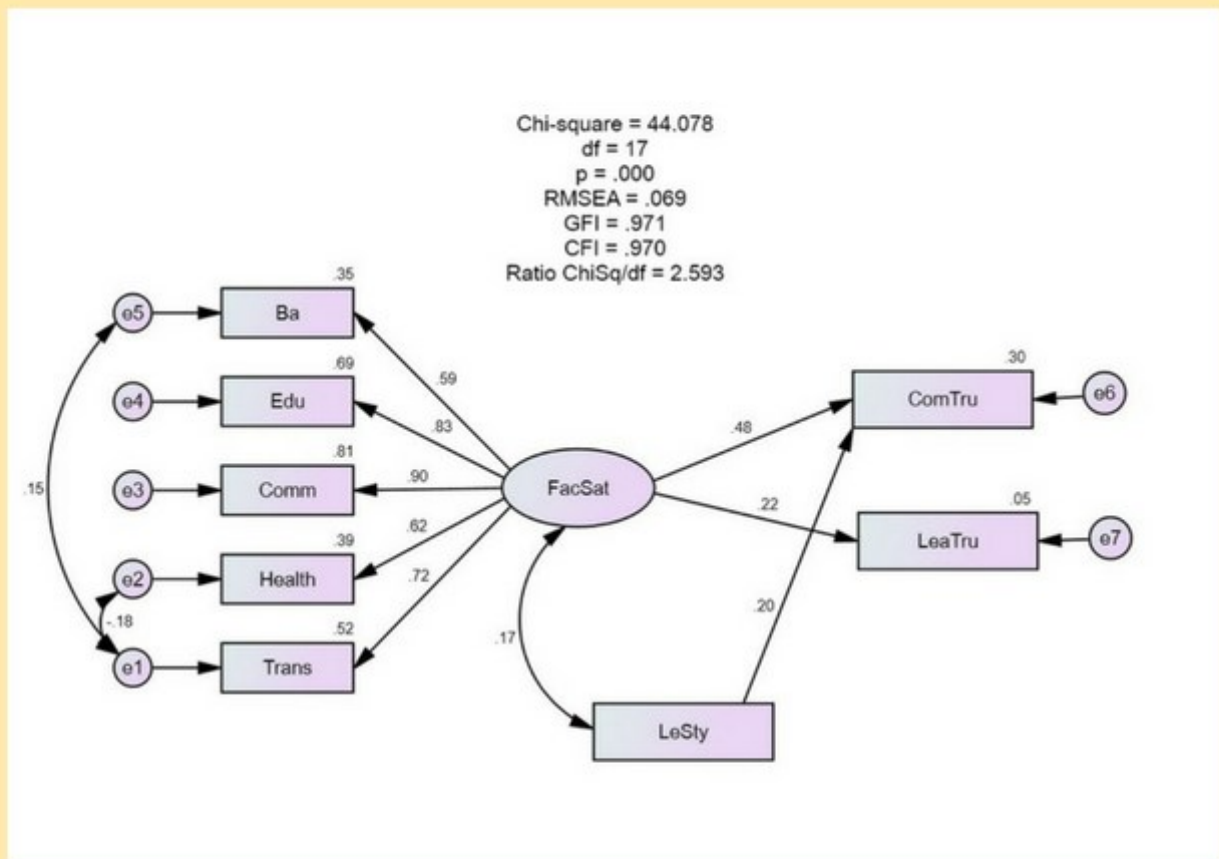


Figure 3 Structural Equation Model (Satisfaction of Neighbourhood Facilities and Social Trust)



SMARTMF : A NOVEL WIRELESS HEALTH MONITORING INNOVATION

**PROF. IR DR. FATIMAH BINTI IBRAHIM,
FACULTY OF ENGINEERING**

For individuals with acute or chronic disease, constant visits to the hospital as part of the long-term treatment process may pose a potential source of stress both for the patient and primary caregivers. In order to improve the quality of life for patients and caregivers, there is an emerging demand for cost-effective solutions to optimise resources in the healthcare industry. Thus, active research is ongoing to develop health monitoring systems with coordinated healthcare intervention and communication systems. Such systems will enable self-care support for individuals to manage and monitor the progression of their diseases in comfort of their home.



SMARTMF

How does the SMARTMF work?

SMARTMF is a non-invasive medical device used by medical practitioners with the primary objective of monitoring the body composition of the patient. SMARTMF uses multi-bio-impedance analysis machine (MFBIA) technology to measure body composition. The body composition information obtained can help medical practitioners to assess and make decisions on the treatment and clinical management. The hardware (installed in 8x4.5x2 centimetre box) can measure impedance parameters at multi-frequency of 5kHz, 50kHz, 100kHz and 200kHz, with output current less than 1 mA. SMARTMF has been validated, compared and benchmarked with commercially available bioimpedance analyzer. The validation data was based on 755 Malaysian healthy subjects (328 male and 427 female subjects) and has shown no significant difference and highly correlated. Another dengue and cholesterol modules validation has also been done and the results have shown that there are highly correlated with current clinical data.



Showing innovation Audit Salat device to the public in Malaysia Technology Expo di PWTC 22-24 February 2018

In Malaysia, the annual total healthcare expenditure (THE) costs are estimated at \$6.6 billion in 2009 (WHO, 2010). An effective remote disease management system will result in a high economic impact, particularly in minimizing hospitalization expenses and emergency rooms occupation (Sidorov et al., 2002; Hamner, 2005; Mattke et al., 2007). Additionally, healthcare expenses will be minimised by reducing visits to the hospital.

This article introduces an innovation of a wireless health monitoring system equipped with a smartphone application. This innovation stands inline with the current trend of wearable and connected healthcare technology. In this prototype, we focus on measuring real-time human body composition parameters for assessment of 1) Cholesterol Level, 2) dengue Severity Risk 3) Biophysical Activities and 4) HIV Patient Management. These four assessment modules are integrated into the smartphone application.



Non-invasive cholesterol management before Salat

SMARTMF for Body Composition Monitoring

Human body composition measurement can be a critical assessment tool for a patient's current state of health. At present, the conventional methods to assess human body composition are dual-energy X-ray absorptiometry (DEXA) and densitometry. These methods involve expensive and bulky equipment, which are not suitable for application in field studies or continuous monitoring. Alternatively, BIA technology is becoming one of the most popular ways to measure body composition because of their speed, convenience and accuracy. The most popular BIA devices in the market are Quadscan 400 and BIA 450. However, these devices are expensive, bulky and require expert/trained personnel to use. SMARTMF offers a cost-effective alternative to measure human body composition and monitor their progress using the smartphone application.

SMARTMF for Cholesterol level monitoring

With the increasing problem of cardiovascular disease due to obesity, cholesterol level assessments are now required to be done on a regular basis. This was however limited by the invasive method of the existing conventional cholesterol assessments. The SMARTMF device offers a non-invasive, safe and portable way to accommodate regular cholesterol test. The smartphone application enables users to track their cholesterol level progression every day.

SMARTMF for dengue monitoring

Dengue fever has been listed as the most prevalent infectious disease in Malaysia with a ratio of 328.3 cases per 100,000 population. To date, there was no effective non-invasive technique of disease management for clinical surveillance and diagnosis of Dengue severity in the hospitalized dengue patients. Thus, this is the first device that can be used to monitor hospitalized Dengue patients without withdrawing blood. The regular monitoring using SMARTMF expected to change the current scenario of Dengue patient management and improvise the conventional treatment regimes. The efficient patient management will reduce national economic burden.

**SMARTMF IS A NON-
INVASIVE MEDICAL
DEVICE USED BY
MEDICAL
PRACTITIONERS WITH
THE PRIMARY
OBJECTIVE OF
MONITORING THE
BODY COMPOSITION
OF THE PATIENT
WIRELESSLY**

Future of SMARTMF

SMARTMF is a non-invasive medical device used by medical practitioners with the primary objective of monitoring the body composition of the patient wirelessly. The novelty of this device is that it comes with four specific health modules with are 1) Dengue Severity Diagnosis, 2) Cholesterol Level Assessment, 3) Audit Solat - biophysical activity assessment of posture and movements in Salat and 4) HIV Patient Management modules.

It is a novel, non-invasive solution to assist healthcare practitioners in monitoring disease progression and treatment regime. The disease management module based on Bioimpedance analysis (BIA) technique also able to significantly discriminate the severity in Dengue patients and cholesterol level in subjects. The incorporation of these modules in SMARTMF will be able to assist the management of Dengue patients and general user to keep track of their cholesterol level without the need for a tedious blood test. This wireless smart product has secured an agreement with industrial partners and the product is expected to be marketed in July 2018. This device will be the first local medical device with specific health management modules integrated with smartphone application which will be made available for international market.

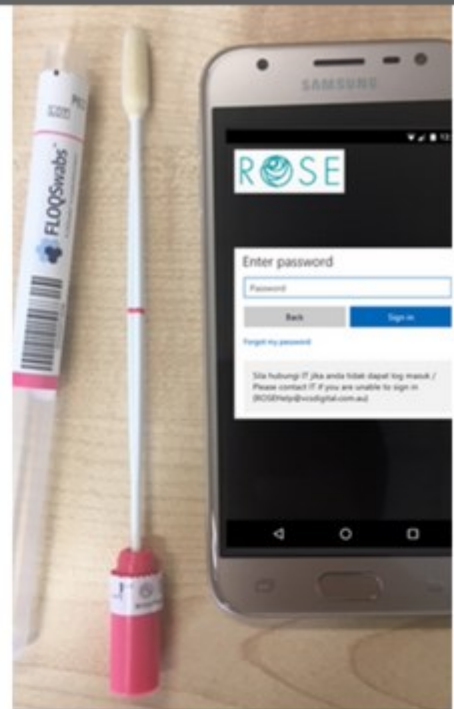
PROJECT ROSE (REMOVING OBSTACLES TO CERVICAL SCREENING)

**PROF. DR. WOO YIN LING,
FACULTY OF MEDICINE**

Cervical cancer remains in the top three most common cancers among Malaysian women. It affects three out of four women under 64 years old. Cervical cancer can largely be prevented by regular cervical screening. Women often do not attend regular screening because of fear, embarrassment and inconvenience experienced despite the regular awareness campaigns and relatively easy access to screening in healthcare facilities.

CERVICAL SCREENING SAVES LIVES. HOWEVER, ONLY 1 IN 5 MALAYSIAN WOMEN WHO ARE ELIGIBLE FOR A CERVICAL CANCER SCREENING WILL EVER HAVE ONE.

Project ROSE is a pilot cervical screening program that employs a human centered approach in developing a solution that responds to the needs of Malaysian women. It integrates the latest advances in self-sampling, human papillomavirus or HPV DNA screening and information and communication technology (ICT). Women will be empowered to take their own cervical screening sample, as an alternative to a health-care professional taking the cervical specimen via a pelvic examination.



ROSE
REMOVING OBSTACLES TO CERVICAL SCREENING





University of Malaya (UM) signed a Memorandum of Understanding (MoU) with Victorian Cytology Services (VCS) Ltd. and Celcom Axiata Berhad on October 5, 2017 to undertake this novel, comprehensive cervical screening program- Project ROSE (Removing Obstacles to cervical ScrEening). The signing ceremony was held at the University of Malaya Art Gallery. VCS has helped shape the cervical screening program in Australia for more than 50 years, including the development of the Victorian Cervical Cytology Registry (VCCR) and the National Human Papillomavirus Vaccination Program Register (NHVPR). VCS Executive Director, Associate Professor Marion Saville expressed VCS' excitement to contribute to this project and help to reduce the impact of cervical cancer on Malaysian women. The robust network and mobile solutions from Celcom will be leveraged on to enable the self-acquire cervical test conducted by University Malaya and VCS Australia. It is one of the many collaboration that the leading telecommunications provider is embarking on, towards embracing digitization and empowering Internet-of-Things, and will further springboard Axiata into provisioning smart health solutions in the near future.

The three components of this novel cervical screening program are:

1. Utilization of self-acquired self swab. This means that women will not require a pelvic examination by a health-care professional to obtain a cervical screen.
2. Instead of conventional pap test, HPV DNA test is far more sensitive and reliable molecular method which has been endorsed and recommended by the World Health Organization (WHO).
3. Comprehensive cervical registry supported by a web-portal, enabled on a mobile device.

All these three components are evidence based and have been shown to be success factors for cervical screening.

Another unique aspect of ROSE is that women will need less cervical screening tests over their lifetime. Current cervical screening program requires women to have up to 15 pap smears in their lifetime, whereas employing the new HPV DNA test (Project ROSE) can reduce that down to 5 tests or less per lifetime.



Pilot Project ROSE conducted at Klinik Kesihatan has demonstrated high acceptability and feasibility of executing this screening method. There has been a demand for it from women outside the study. The ROSE solution will increase the uptake of cervical screening among women.

UNIVERSITY OF MALAYA ECO-CAMPUS INITIATIVES

**ASSOC. PROF. DR. SUMIANI YUSOFF,
INSTITUTE OF OCEAN AND EARTH SCIENCES**

UM Eco-Campus initiatives, spearheaded by Sustainability Science Research Cluster with the support from Department of Development and Estate Maintenance (JPPHB), University of Malaya Living Labs and University of Malaya Sustainable Development Solutions Network (UM SDSN), started officially in 2016. The University of Malaya Eco-Campus Standing Committee (UMECS) was formed to answer for call-on-actions in mainstreaming and strategizing efforts for the UM Eco-Campus initiatives.

The Eco-Campus initiatives aim to develop a novel campus-wide sustainability framework with direct support from the Living Labs' outputs, which contribute towards minimizing harmful environmental impact in campus especially by decreasing the amount of carbon emission, and bring UM with another leapfrogging record as one of the leading eco-friendly campuses.

The Living Lab Grant Programme serves as a knowledge - action research platform in waste, water and energy management, and greening & biodiversity to improve the sustainability of their operations. It fosters applied research and education by using the campus to test real-time sustainability solutions, offering opportunities to turn theories into practice, and enabling students to achieve greater engagement with a more well-rounded educational experience.

**THE IDEA OF LIVING LAB IS TO
CONVERT WHOLE UNIVERSITY
CAMPUS INTO LIVING LABS AND
USES UNIVERSITY'S RESEARCH
CAPABILITIES TO SOLVE
SUSTAINABILITY ISSUES**

Launched in 2016, the UM Living Labs is now in its second cycle. Among the highlighted projects are Water Warriors (focuses on the revival of Tasek Varsiti UM and water management in campus), Zero Waste Campaign (emphasizes on sustainable waste management in UM) and The RIMBA Project (focus on urban biodiversity and environmental education).

UM Living Labs have shown significant contributions in numerous prestigious ranking and assessment platforms, such as the Universitas Indonesia Green Metric World University Ranking, Low Carbon Cities Framework (Ministry of Energy, Green Technology and Water), Audit Kampus Hijau (SWCorp), and the ASEAN University Network Quality Assessment (AUN-QA). Living Labs have reduced 4,750,000 kg CO₂ Green House Gases (GHG) emission, converting to an indirect monetary gains of more than RM 461,611.95 a year.

UM ^{as a} Living Lab

ACTION-ORIENTED & TRANSLATIONAL RESEARCH
to provide sustainable solutions to the campus

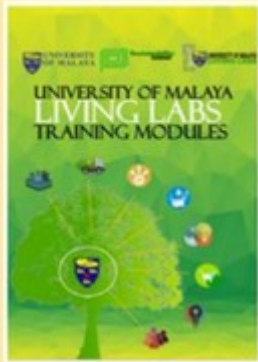
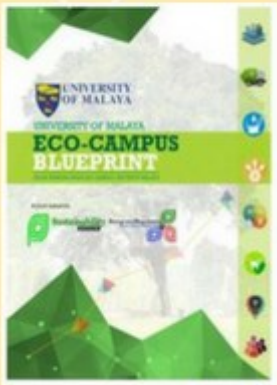


From laboratory research



To real life solutions





8 CORE AREAS

UNIVERSITY OF MALAYA
ECO-CAMPUS BLUEPRINT



ECO-CAMPUS BLUEPRINT

University of Malaya Eco-Campus Blueprint (UMECB) is a guideline that gives emphasis to eight (8) Core Areas of University of Malaya (CAUM), namely

- (1) Landscape and Biodiversity Management
- (2) Waste Management
- (3) Water Management
- (4) Energy Management
- (5) Transportation System Management
- (6) Green Procurement
- (7) Education Management - environment and climate change
- (8) Change Management in governance, participation, and communication.

All eight core areas identified as a field that requires commitment and holistic approach cutting across disciplinary, expertise, responsibility center (RC) which involves the top management of UM, academic and non-academic staff and students.

UMECB sought to be an aspiration in a form of University of Malaya commitment as one community working synergically toward a more sustainable campus in the future. All action plan is displayed in the form of short term plans and long term plans to give room of opportunity to the campus community to take proactive measures, to promote the University of Malaya as one of the prominent Eco-Campus model at the local, regional, and international level.

IPPP CENTRAL LAB FACILITIES & SERVICES

PARTICLE IMAGE VELOCIMETRY

DANTEC DYNAMICS NANO L135-15PIV

- Whole-flow-field technique providing instantaneous velocity vector measurements in a cross-section of a flow.
- Applications for fluid & solid mechanics, hydraulics, hydrodynamic, material research.



LC/MS Q-TOF

AGILENT 6550 IFUNNEL

- Separate wide range of organic compounds from small molecules, drugs, metabolites, peptides & protein.
- Optimized for qualitative analysis and provide information on high resolution molecular weight.



RHEOMETER

TA INSTRUMENT DHR-2

- Provide information of the material viscosity and viscoelastic.



AUTOMATED SPIRAL PLATER & COLONY COUNTER

EASY SPIRAL INTERSCIENCE & SCAN 500

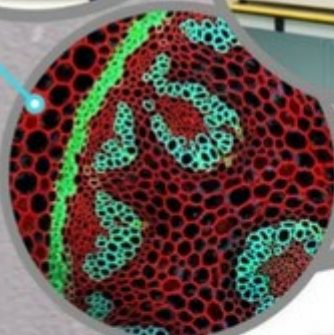
- Automatic plating on petri dish in seconds with decreasing concentration.



CONFOCAL LASER SCANNING MICROSCOPE

LEICA TCS SP5 II

- 3D images by optical sectioning
- Live cell imaging



SURFACE AREA ANALYZER

Micromeritics ASAP2020

TRISTAR II 3020 Kr

- Surface area (BET/LANGMUIR)
- Pore volume & size distribution
- MS ISO/IEC 17025 TESTING SAMM NO. 837



REAL TIME PCR

QUANTSTUDIO 12k FLEX

- Absolute quantitation
- Gene expression analysis
- miRNA
- ncRNA
- Protein expression analysis
- SNP genotyping
- Copy number variation
- HRM analysis



ELLIPSOMETER

J.A. WOOLLAM M-2000V

- Measure polarization state of light reflected from a surface of material.
- Widely used in thin film identification, film thickness, optical constant.



FIELD EMISSION SCANNING ELECTRON MICROSCOPE

FEI QUANTA FEG 450 OXFORD

- Structure (topography & morphology) and composition characterization



AGAR PLATING SERVICE

- Nutrient agar, tryptic soy agar and many more.



PULSED FIELD GEL ELECTROPHORESIS

BIO-RAD CHEF MAPPER

- Separate large DNA molecules by applying to a gel matrix an electric field that periodically changes direction.
- Application: contamination source tracking, provide information of bacteria based on their retention time.





ITEX'18 GOLD AWARDS



UNIVERSITY
OF MALAYA

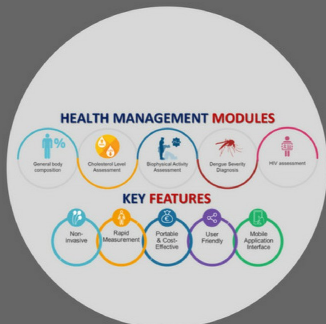


UNIVERSITY OF MALAYA RESEARCH



The world's 1st non-invasive, rapid, feasible with cost-effective interventions for cholesterol level device for body composition assessment with 3 health management modules. A self-powered device that delivers current (<1mA) into human body and measures the impedance and phase angle at multiple frequencies (5, 50, 100 and 200kHz)

SMARTMF HEALTH MANAGEMENT



Prof. Ir. Dr. Fatimah Ibrahim, Centre for Innovation in Medical Engineering (CIME), Department of Biomedical Engineering, Faculty of Engineering, University of Malaya



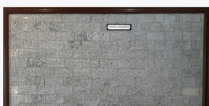
SCOLIOS2

The 1st low cost device in the market with digitized and intuitive reading for high accuracy and precision which enable health practitioner and patient to do self monitoring and aid in early diagnosis of scoliosis and shoulder symmetry assessment in a shorter period.

Ir. Dr. Lai Khin Wee
Department of Biomedical Engineering,
Faculty of Engineering
University of Malaya

STRUCTURAL GRADE BRICKS

Whole replacement for conventional granite chip



Low Carbon binder for bricks/blocks



LIGHTWEIGHT ZERO-CEMENT PAVEMENT BLOCKS

BLAST RESISTANT LIGHTWEIGHT CONCRETE USING INDUSTRIAL WASTES

Intact OPS concrete panel using oil palm shell (OPS - fibrous with convex and concave surfaces) as whole replacement for conventional coarse aggregate



ILs & DESs

- Economically viable method for desulphurization of fuels under ambient conditions without producing any toxic by-product
- Catalyst based DES was introduced and used for the first time in biodiesel production

Dr. Adeb Hayan
Nanotechnology & Catalysis
Research Centre (NANOCAT),
Institute of Graduate Studies
University of Malaya

GRAPHENE-DOPED ZIRCONIA ENGINEERED FOR INDUSTRIAL & MACHINE APPLICATIONS

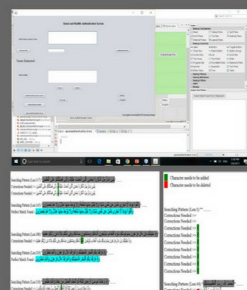
An invention deals with the development of a new class of zirconia through selective doping with graphene and subjecting the parts to microwave sintering process.

The derived components exhibited superior mechanical and electrical properties for a host of industrial and machine applications.

Assoc. Prof. Dr. Tan Chou Yong
Department of Mechanical Engineering,
Faculty of Engineering
University of Malaya



DIGITAL QURAN AUTHENTICATION SYSTEM



- Authenticated Quran are able to be shared without fear of being tampered again due to application of watermarking.
- By using segmentation of Quranic texts and optimization of string matching algorithms, given input is checked character by character for a match.

Commerciality and Market Potential



Dr. Amirrudin Kamsin
Computer System & Technology,
Faculty of Computer Science and
Information Technology
University of Malaya

DR. MURAD ABDU
SAEED
&
PROF. KAMILA
GHAZALI
FACULTY OF
LANGUAGES AND
LINGUISTICS

LEARNING IN A PEER RESEARCH GROUP AMONG POSTGRADUATES: SUPPORT AND CHALLENGES

What is a peer research group? And why is it important?

Peer research groups or thesis writing groups are groups of postgraduates holding informal meetings and discussions of their research challenges and concerns in research, particularly thesis writing. The sociocultural theoretical approach to learning and constructing knowledge assumes that learning and knowledge construction occur as a result of peer interactions in such groups, including peer feedback.

In many higher education contexts, development of research proposals tends to be a challenging task for postgraduates, which necessitates a support that complements research supervision. Therefore, the recently increasing attention given to peer research groups and the challenges faced by postgraduates in doing their research, particularly in developing their research proposals encouraged us to engage 15 postgraduates at the Faculty of Languages and Linguistics, University of Malaya, in a peer research group.



A Sample proposal presentation of postgraduates

Postgraduates' practices in the peer research group

The peer research group created was exclusive to the research proposal stage rather than thesis writing. In order to provide focus and avoid pervasive challenges in full thesis writing, the proposed group was exclusive to the research proposal stage rather than thesis writing. Therefore, all subjects are at the beginning stage of their research projects. In brief, the postgraduates met each Friday over one academic semester of the academic year (2016/2017). They presented their research proposals to their peers and two mentors. Due to the limited time, the postgraduates' activities in the peer research groups were expanded to online WhatsApp and Facebook groups.

At the end of the study period, the postgraduates had focus group discussions and follow-up interviews were conducted where they could articulate their ideas and thoughts as a reflection on their learning in the peer research group.

How did the peer research group support postgraduates in research proposals?

The peer research group as observed and video recorded assisted the postgraduates in research proposals in different ways. The most important support provided was the peer interaction or feedback.

As the postgraduates engaged in peer feedback, they could identify the following various issues in their research proposals:

1. Issues related to topic selection and title formulation.
2. Issues relevant to the background of research topics, including problem statements and rationale for proposing such studies.
3. Issues pertinent to significance and contributions of studies.
4. Issues related to compelling, specific and achievable research objectives and questions in the proposals.
5. Issues relevant to the sound theoretical frameworks and relevant literature reviews.
6. Methodological issues, including suitable research designs, sampling, sample size, data collection and analysis as well as reliability and validity of research instruments.



Postgraduates' group discussions and reflection on experiences.

The group also encouraged practice in research proposal presentation to their peers before their actual defence of proposals. This, in turn, helped them to become more confident about their research as each presenter had to listen to peer questions and respond to them by addressing the main concerns in his/her proposal. On the other hand, those postgraduates who acted as evaluators felt that they were active learners who contributed to the group's learning about research.

PEER FEEDBACK IS A MEDIATING AND CONSTRUCTIVE TOOL FOR ADDRESSING AND UNDERSTANDING VARIOUS ISSUES IN RESEARCH PROPOSALS

Another interesting aspect of peer learning in the peer research group is the role of technology, specifically the WhatsApp group and facebook group, in maximizing the learning opportunities for the case postgraduates. This assisted them to interact regardless of the time and place restrictions. They could also exchange more constructive feedback and share links carrying information needed by peers.

What challenging concerns are arising from the peer research group?

Despite the above-mentioned pedagogical support offered and facilitated by the peer research group, the case of postgraduates seemed to be challenged by few concerns. First, some of them seemed to be reserved about presenting their proposals and exchanging feedback on peers' proposals. Another concern arising from the postgraduates' engagement in the peer research group is peer feedback. In other words, it seems that some postgraduates were concerned about the reliability of knowledge of feedback providers.

So what is the implications for pedagogy and research supervision in higher education?

The peer research group has several important implications for pedagogy and research on supporting postgraduates in research. First and most importantly, peer feedback is a mediating and constructive tool for addressing and understanding various issues in research proposals. Secondly, postgraduates need to learn how to present their proposals and defend themselves prior to their actual defence.

In this regard, such mock presentations contribute to postgraduates' development of self-defending skills implicated through the responses of presenters to peers' questions seeking clarification, elaboration and justification of various aspects of their proposals. Presentation practices also made the postgraduates more confident and aware of the audience.

Developing confidence and awareness of the potential audience are important issues in the success of proposal and thesis defence and examination. Finally, to maximize the value of peer research groups, supervisors as experts in different majors need to be incorporated in such groups to minimize postgraduates' concerns about the reliability of peer feedback.

UNRAVEL THE THERMAL MATURITY INFLUENCE ON MALAYSIAN COALS USING PYROLYSIS TECHNIQUES

PROF. DR. W. HASIAH BINTI ABDULLAH
FACULTY OF SCIENCE

Coal is a sedimentary rock that is composed largely of terrestrial-derived plant material. It is heterogeneous in composition and complex in structure. Originally deposited as peat, it is transformed into coal through chemical and physical processes due to compaction and heat over prolonged burial at depths of up to several kilometers in the earth's subsurface and over periods of many millions years (geological time is very long). The degree of organic metamorphism experienced during burial, which is commonly referred as coalification (or maturation), transforms the peat progressively into low-rank coal (lignite) to high rank coal (meta-anthracite). This is referred to as increasing maturity.

Coal was the fuel that powered the industrial revolution that lead to the emergence of superpowers such as the United Kingdom and the United States of America. But it is a dirty fuel and known to have contributed to climate change and consequently adverse environmental implications that are strongly associated with mining and combustion activities. The burning of coal emits greenhouse gases, in particular carbon dioxide, methane and nitrous oxide. However, along with oil and natural gas, coal is still amongst the fossil fuel resources of great economic importance and that provides the main source of energy, especially in developing countries such as China, Nigeria and Malaysia. It must therefore be considered, at the moment, as a "necessary evil". Such good and bad characteristics of such a dull looking rock, has intrigued many researchers worldwide to study coal, and this includes the Petroleum Geoscience Group researchers at the Department of Geology, University of Malaya, whom have collaborated with researchers from Consejo Superior de Investigaciones Cientificas (CSIC), Spain. The team investigated the effect of thermal maturity on the pyrolysis products of selected coals from Sabah and Sarawak and have recently published the findings in the International Journal of Coal Geology, volume 182.



Pyrolysis is a technique consisting of thermal decomposition of material performed at elevated temperatures in a closed system under inert conditions. In this study, two pyrolysis techniques were applied namely, pyrolysis gas chromatography-mass spectrometry (Py-GC-MS) and thermally assisted hydrolysis and methylation (THM) GC-MS that were performed at CSIC. The main objective of the study was to characterise the analysed coals in relation to coal rank by comparing the compositional molecular fingerprints of the two methods. For this purpose, a comparison was made with vitrinite reflectance (%Ro) which is a widely used maturity parameter. %Ro is a petrological thermal maturity (rank) analysis performed on polished rock blocks under oil immersion using a photometry microscope available at the Department of Geology, UM. Vitrinite is best suited for the rank determination as it changes in a fairly uniform manner throughout the coalification series. A total of 27 coals from Mukah-Balingian, Sarawak and from a few areas in Sabah, were analysed. These coals range in rank (maturity) from lignite to high volatile bituminous coal with vitrinite reflectance values 0.28% to 0.66%.

COAL WAS THE FUEL THAT POWERED THE INDUSTRIAL REVOLUTION THAT LEAD TO THE EMERGENCE OF SUPERPOWERS

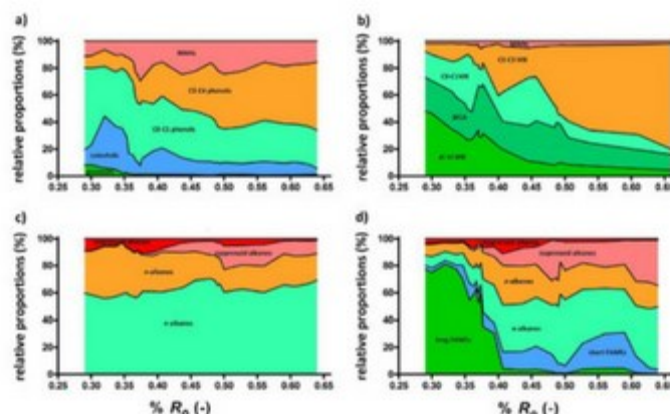


Figure 2. Summed relative proportions of the aromatic and polymethylene components for Py-GC-MS (a & c) and THM-GC-MS (b & d) (from Kaal et al., 2017).

The pyrolysis products of the Py-GC-MS techniques are dominated by n-alkanes (C9-C35), n-alkenes (C10-C33), isoprenoids alkanes and alkenes, monocyclic aromatic hydrocarbons (MAHs), polycyclic aromatic hydrocarbons (PAHs) and phenols. This is shown in the density plot of atomic O/C versus H/C on the basis of average proportions of all samples. The fatty acid methyl esters (FAMES), straight chain and branched alkanes and alkenes, PAHs and methoxybenzenes are the main products in the THM-GC-MS chromatograms. The major difference between these two fingerprints is the larger abundance of fatty acids (detected as FAMES) in the THM-GC-MS compared to the Py-GC-MS trace. Figures 1 displays the plot for mature coals (positive surface) and immature coals (negative surface) which show that as a consequence of coalification, there are increases in the relative

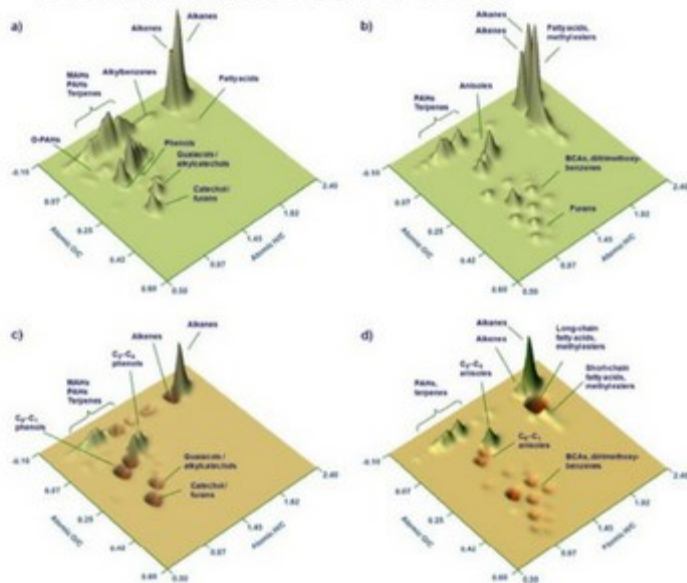


Figure 1. Surface density plots of the Py-GC-MS (a & c) and THM-GC-MS (b & d) (from Kaal et al., 2017).

proportions of short-chain n-alkanes and n-alkenes, isoprenoid hydrocarbons, C2-C4 alkylphenols and PAH, whereas short-chain alkylphenols, catechol, guaiacols and long chain n-alkanes and n-alkenes (> C25) are depleted with increasing rank.

Natural coalification has a profound effect on pyrolysis products, as shown by correlation of pyrolysis data with vitrinite reflectance in Figure 2. It has shown that the aromatic products from Py-GC-MS, whilst Figure 2b shows aromatic products from THM-GC-MS (MAH = monocyclic aromatic hydrocarbons, MB = methoxybenzenes, BCA = benzenecarboxylic acid). Figure 2c shows polymethylene compounds from Py-GC-MS, whilst Figure 2d shows the polymethylenes from THM-GC-MS (long FAMES = C20-C30 fatty acid methyl esters, short FAMES = C8-C18 fatty acid methyl esters). There is a small relative increase of n-alkanes over n-alkenes with increasing %Ro with Py-GC-MS. The THM-GC-MS allows for a more detailed assessment of the molecular composition of the polymethylene compound than Py-GC-MS due to detection of the carboxyl and/or ester groups. In the low %Ro range (0.28-0.37%), long-chain (> C20) FAMES are dominant. There is a sharp transition from %Ro 0.37 to 0.41%, where the long-chain FAMES are virtually absent and total abundance of all other polymethylene component increase. Above that maturity, there is considerable variation in total abundances of short-chain FAMES, n-alkanes, n-alkenes and isoprenoid alkanes.

The findings of the study are believed to be able to provide a framework for the biogeochemical assessment of Malaysian coals for any coal utilisation purposes as well as having potential in applications related to environmental pollutants by optimising the pyrolysis conditions.



THE IMPLEMENTATION OF MACHINOEKI CONCEPT IN TAIPING

**DR. YONG ADILAH BINTI SHAMSUL HARUMAIN,
FACULTY OF BUILT ENVIRONMENT**

In 2010, Taiping has been recognized as one of the heritage towns in Malaysia under the National Physical Plan 2 by Ministry of Urban Wellbeing, Housing and Local Government. Old buildings in the town remained intact although some were completely gone. These features are the salient sources for conferring such township, therefore, they need to be sustained through the concept of Machinoeki.

Volunteerism is the biggest challenge for implementing Machinoeki concept in a developing country and multi-cultural community such as Malaysia. As one of the core elements is to provide free toilet and hospitality, community learns to give, tolerate and create interchanges. The local authority, on the other hand, needs to change the community mindset from "receiving" to working together with the local government.

**OLD BUILDINGS NEED TO
BE SUSTAINED THROUGH
THE CONCEPT OF
MACHINOEKI.**

The attributes of buildings are more meaningful and distinctive when they facilitate or reinforce certain activity pattern. In a larger context, these activities not only influence the distinctiveness of the buildings, but also the town itself. The Machinoeki concept does not involve changes of any structures or constructing new buildings, unlike the conventional way where local government has to invest on constructing new buildings for resting areas and toilets.





The introduction of Hentian Komuniti (Japanese Machinoeki) in Taiping shows the commitment of Taiping local authority in promoting good governance.

The Machinoeki (Hentian Komuniti) concept in Taiping, Perak, which was officiated in late December 2017, is unique and the first in Malaysia. Apart from relieving the local authorities in providing such services for tourists and visitors, this concept helps in building the capacity of participating premise owners and managers. By participating as service providers, premise owners will be able to come up with their own solutions related to infrastructure and available materials without relying too much on the local authorities.

In Japan, the concept of Machinoeki has proven to be able to enhance social capital of the communities through the network of Machinoeki masters. They not only confined to their own businesses, but are also connected through events and campaign organizations. Having densely interconnected communities is an advantage to the community and its local authority in terms of working collectively and facilitate social actions to achieve a common goal.

Dr Yong Adilah Shamsul Harumain, the principal researcher of this project, investigates Machinoeki concept that embrace the beautiful culture of Japanese in hospitality to be applied in Taiping town. It is a great challenge and a huge leap to community involvement in Malaysian town planning. This research is strongly supported by Machinoeki Japan and the representative of the organization, Ms Keiko Yoshida has visited Taiping twice to support the setting up of Machinoeki in Malaysia.



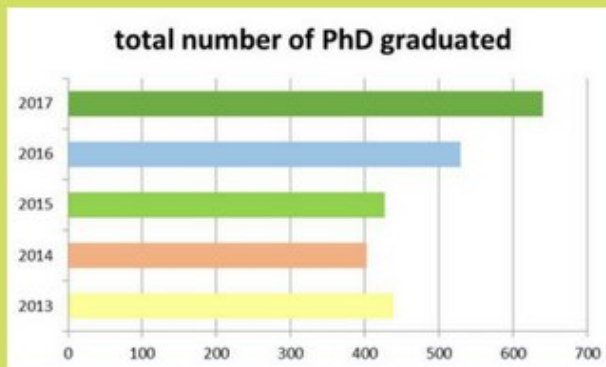
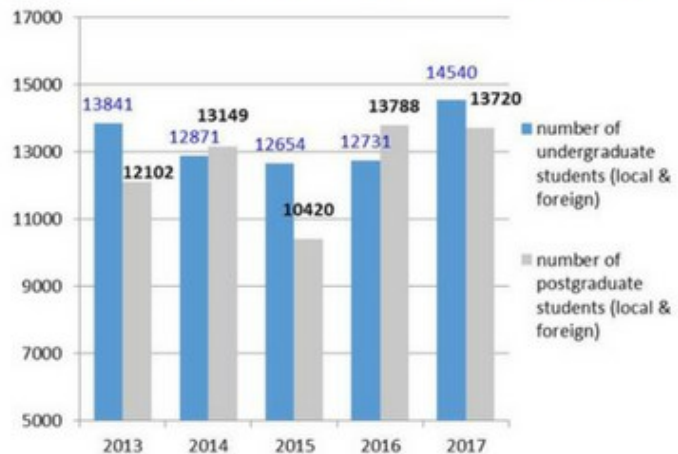
The research team is strengthened by the experts of Urban Management, Dr Nikmatul Adha Noordin and Building Control, Dr Nur Farhana Azmi. Professor Akinori Morimoto from Waseda University Japan and Dr Osada Teppei from Utsunomiya University Japan collaborate in this research too.

This article has been published in Asia Research News
http://www.researchsea.com/html/article.php/aid/11526/cid/6/research/people/university_of_malaysia/the_implementation_of_machinoeki_concept_in_malaysia_historical_town.html

ACHIEVEMENTS 2013-2017



NUMBER OF POSTGRADUATE AND UNDERGRADUATE STUDENTS SINCE 2013



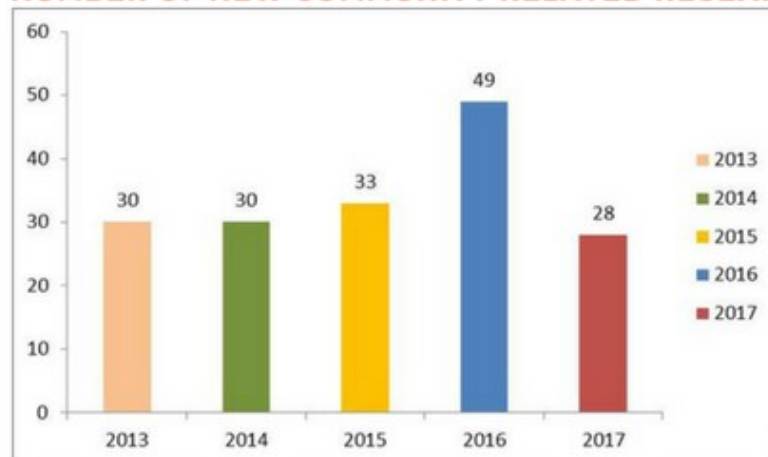
STEADY INCREASE OF PHD GRADUATES SINCE 2013

14

ACCREDITED LABORATORIES SINCE 2013



NUMBER OF NEW COMMUNITY RELATED RESEARCH PROJECTS



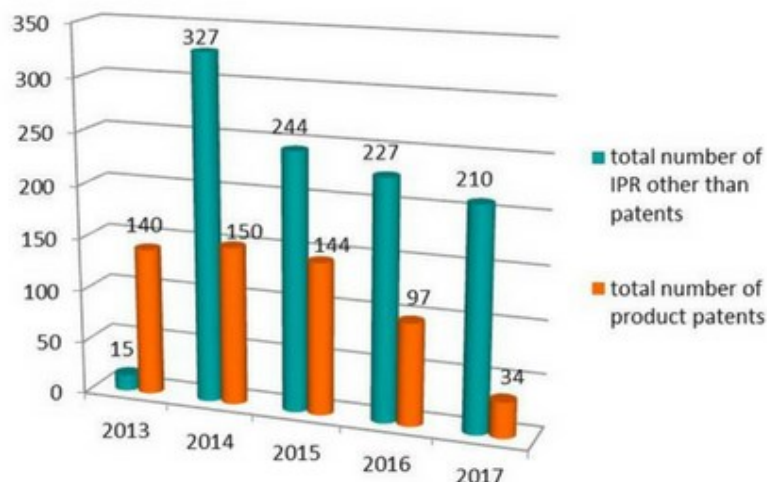
ACHIEVEMENTS 2013-2017

11

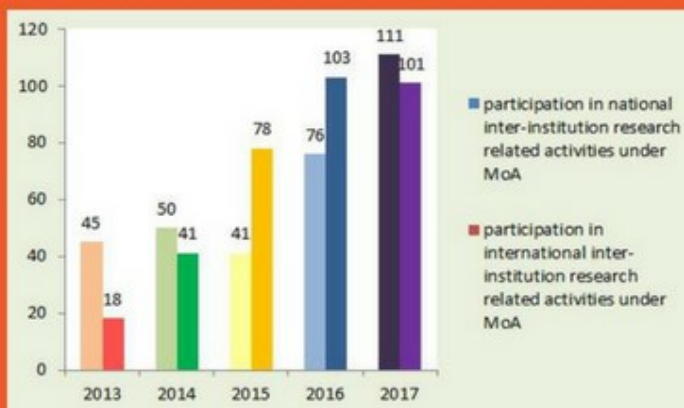
**COMMERCIALIZED
PRODUCTS
SINCE 2013**



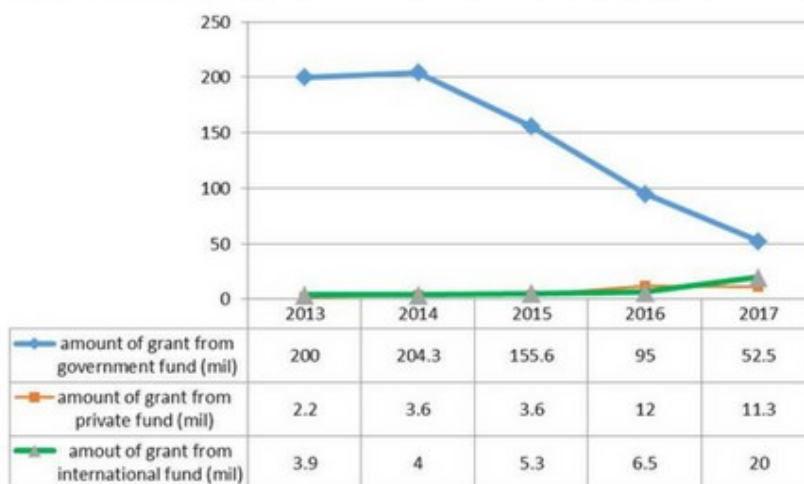
NUMBER OF IPR & PATENT



NUMBER OF UM'S PARTICIPATION AT NATIONAL VERSUS INTERNATIONAL LEVEL



RESEARCH GRANTS RECEIVED (IN RM MIL.)





HAPLOIDENTICAL BONE MARROW TRANSPLANTATION

PROF. DR. HANY ARIFFIN, FACULTY OF MEDICINE

10-month-old Muhammad Yusuff Hambali met Professor Hany Ariffin, a senior consultant in Paediatric Haematology-Oncology and Head of Bone Marrow Transplantation Unit at the University of Malaya Medical Centre (UMMC) in early 2016. Yusuff was extremely underweight at only 5 kg, having suffered multiple infections including pneumonia and dissemination of his BCG vaccine, chronic diarrhoea and severe malnutrition. The reason for his poor health was a rare condition called Severe Combined Immunodeficiency (SCID), commonly known as "Bubble Boy" disease. Yusuff was born without a functioning immune system, and the only recognized curative treatment for this condition is a bone marrow transplant.

Bone marrow transplantation requires stem cells from blood or bone marrow of a donor to be transplanted into a recipient to enable healthy cells to replace the diseased bone marrow. In conventional transplants, the donor and recipient's bone marrow cells are needed to be completely matched where their immunological 'fingerprints' i.e. all ten human leucocyte antigen (HLA) alleles are identical. This would allow growth and development of new healthy blood cells in the recipient, and avoid the donated cells to fatally attack the recipient's organs. A child will inherit half of their HLA alleles from each parent, thus a perfect match can only possibly be from a sibling. However, at that point, Yusuff was an only child.



For Professor Hany and her team, this new technique of using HLA haploidentical donors was going to radically change bone marrow transplantation services in Malaysia forever. Their success meant that this treatment could now be offered to other children with life-threatening conditions who do not have fully matched donors.

Prof. Hany and her team has modified the John Hopkins University technique which allowed "half-matched" human leucocyte antigen (HLA) to be transplanted without risking fatality, and applied to Yusuff as the first child to undergo this procedure in UMMC. This ground breaking technique allowed a parent to donate his/her 'half-matched' (5 out of 10 HLAs) cells for transplantation. In addition, Prof. Hany and her team designed a personalized chemotherapy regimen to remove remaining bone marrow cells in the patients before transfusing parent's donated bone marrow. This was then followed by manipulating the transplanted cells with a combination of drugs if the response was too robust.

For the initial few months after the procedure, Yusuff battled graft-versus-host disease, where his father's donated cells were effectively attacking his lungs, skin and intestines. Finally, 149 days, Yusuff was well enough to be discharged. He is now free of infection and has grown into an active and independent little boy.

To date, they have treated a further nine children using half-matched stem cells from their family members.

The journey of Yusuff is a testament that through research, innovation and perseverance, UM paediatric oncology team are able to break immunological, and other intangible barriers, allowing precious young lives to be saved.

HUMAN RIGHTS AND POLICY MAKING IN MALAYSIA

DR. KHOO YING HOOI,
FACULTY OF ARTS AND SOCIAL SCIENCES

Misperception of human rights occurs due to the lack of knowledge about human rights. The idea of human rights should be understood that as an evolutionary account. Human rights are also grounded in universal objective values, which are rooted in basic human needs such as the right to food, the right to shelter and the right to safe water. Although Federal Constitution recognized civil liberties, the practical implementation of human rights obligations remains a major challenge.

Before 1997, most United Nations development agencies pursued a basic needs approach, whereby they identified basic requirements of beneficiaries by either supported initiatives to improve service delivery or advocated for their fulfilment.

The introduction of human rights-based approach (HRBA) changes this by moving beyond the basic needs approach. HRBA integrates human rights obligations, standards, interpretations and principles. This approach entails a shift of perspective in the strategic focus of cooperation. The partner states' institutions are now "duty-bearers", who must fulfil their human rights obligations, while the people or target groups become "rights-holders", who are empowered to claim their rights effectively.

The seminar on human rights and policy making was organized by the Legal Affairs Division of the Prime Minister's Department on 29th August, 2017, focusing

on the development of the national human rights action plan (NHRAP). Among the objectives are to create awareness among civil servants on the importance of incorporating human rights element into the framework of public policy development and to raise understanding among the civil servants on the significance and benefits of an effective NHRAP to Malaysia.

NATIONAL HUMAN RIGHTS ACTION PLAN (NHRAP)

● Strengthening basic rights in Malaysia



Three initial mechanisms





Mainstreaming HRBA enables the government to implement the individual's fundamental and human rights in compliance with the fundamental rights provisions in the Constitution and the international human rights treaties. Furthermore, it also enables the NHRAP in establishing a comprehensive system for implementation, monitoring and evaluation.

Human rights are crosscutting issues. Human rights are indivisible; the improvement of one right facilitates advancement of the others. Likewise, the deprivation of one right adversely affects others. It is not about the indicators in numbers that should count when discussing human rights, it is the human rights culture that we need to nurture.

The Human Rights Commission of Malaysia (SUHAKAM) has made recommendation to the Malaysian government to formulate a national human rights action plan (NHRAP) in 2001 and include the first Universal Periodic Review (UPR)'s recommendations as a reference point in the development of Malaysia's NHRAP. However, the Cabinet only announced its decision to develop Malaysia's NHRAP in 2012, a year before the second UPR.

The NHRAP reflects the government's commitment to protection and promotion of human rights as provided by the Constitution (Articles 5-13), by helping to translate the government's duty to protect fundamental and human rights into concrete terms, to guarantee human rights according to international agreements entered into by the government, and to reinforce the Malaysian society by improving the efficiency of the implementation of the individual's rights. For example, if we talk about housing, we should be thinking about the right to shelter and housing. It is an obligation of the state to ensure the people enjoy the basic rights. The right to housing is considered as violated if a state engages in arbitrary forced evictions.

5 MAIN PILLARS OF NHRAP:

- (1) CIVIL AND POLITICAL RIGHTS
- (2) ECONOMIC, SOCIAL AND CULTURAL RIGHTS
- (3) RIGHTS OF VULNERABLE GROUPS
- (4) RIGHTS OF THE INDIGENOUS AND ABORIGINES
- (5) INTERNATIONAL OBLIGATIONS

Professor Abu Bakar Munir from the Faculty of Law was the Team Leader in developing the Malaysian NHRAP, while Dr. Mohammad Ershadul Karim, also from Faculty of Law, worked as a Consultant in charge of pillar no. 5 'International Obligations'. This article has been published in Asia Research News (http://www.researchsea.com/html/article.php/aid/11146/cid/6/research/human_rights_and_policy_making_in_malaysia.html).





Infra Analysis

INFRA LAB SERVICES
UNIVERSITY OF MALAYA



Infra Microbiology

INFRA LAB SERVICES
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Infra HIR

INFRA LAB SERVICES
UNIVERSITY OF MALAYA



Animal Testing facilities

INFRA LAB SERVICES
UNIVERSITY OF MALAYA



InfraLab

INFRA LAB SERVICES
UNIVERSITY OF MALAYA

INFRA LABORATORY SERVICES

- INFRA ANALYSIS
- INFRA MICROBIOLOGY
- INFRA HIR
- ANIMAL TESTING FACILITIES

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CELEST

CENTRE FOR LAW AND ETHICS IN SCIENCE AND TECHNOLOGY

THE CENTRE FOR LAW AND ETHICS IN SCIENCE AND TECHNOLOGY (CELEST) IS A RESEARCH CENTRE AT THE FACULTY OF LAW, UNIVERSITY OF MALAYA. CELEST WAS PREVIOUSLY KNOWN AS THE CENTRE OF EXCELLENCE FOR BIODIVERSITY LAW (CEBLAW). THIS RENAMING INITIATIVE, WHICH TOOK PLACE IN 2017, WAS PROMPTED BY THE TRANSFORMATIVE IMPACT OF RAPID DEVELOPMENTS IN SCIENCE AND TECHNOLOGY ON OUR LIVES. CELEST ENGAGES IN AND PROMOTES RESEARCH ON THE LEGAL AND ETHICAL IMPLICATIONS OF THE BROAD FIELD OF SCIENCE AND TECHNOLOGY. IT UNDERTAKES INTERDISCIPLINARY AND INTRADISCIPLINARY RESEARCH THAT INTEGRATE LEGAL THEORIES WITH PRACTICAL APPLICATION IN DIVERSE ASPECTS OF SCIENCE AND TECHNOLOGY.

Objectives

- TO UNDERTAKE AND PROMOTE LEGAL RESEARCH IN AREAS THAT ARE RELEVANT TO SCIENCE AND TECHNOLOGY
- TO FOSTER LINKAGES WITH BODIES, NATIONAL AND INTERNATIONAL, WORKING ON AREAS RELATING TO THE LAW AND ETHICS IN SCIENCE AND TECHNOLOGY
- TO BE A RESOURCE CENTRE ON MALAYSIAN LAW AND ETHICS IN SCIENCE AND TECHNOLOGY

For research collaboration, please contact
Associate Professor Dr Tay Pek San
at tayps@um.edu.my



**UNIVERSITY
OF MALAYA**

IRIISE²⁰18

INTERNATIONAL RESEARCH INNOVATION, INVENTION & SOLUTION EXPOSITION

THEMES & TOPICS



ARTS & HUMANITIES

Archaeology, Architecture/Built Environment, Art & Design, English Language & Literature, History, Linguistics, Modern Languages, Performing Arts, Philosophy, Theology, Divinity & Religious Studies

ENGINEERING & TECHNOLOGY

Computer Science; Information Systems Engineering; Chemical Engineering; Civil & Structural Engineering; Electrical & Electronic Engineering; Mechanical, Aeronautical & Manufacturing Engineering; Mineral & Mining



LIFE SCIENCE & MEDICINE

Agriculture, Forestry, Anatomy, Physiology, Biological Sciences, Dentistry, Medicine, Nursing, Pharmacy, Pharmacology, Psychology, Veterinary Science

NATURAL SCIENCE

Chemistry, Earth & Marine Sciences, Environmental Sciences, Geography, Materials Science, Mathematics, Physics, Astronomy



SOCIAL SCIENCE & MANAGEMENT

Accounting; Finance; Anthropology; Business & Management Studies; Communication & Media Studies; Development Studies; Economics & Econometrics; Education & Training; Hospitality & Leisure Management; Law, Politics & International Studies; Social Policy & Administration; Sociology; Sports-related Subjects; Statistics & Operational Research

HIGHLIGHTS



- Abstract MUST NOT exceed 500 words.
- Abstract will be published in the proceeding website unless stated otherwise
- All submissions may have multiple authors but limit to 5 PAX ONLY.



- Print out A1 poster size in PORTRAIT
- Print out invitation letter & payment details



- Standard Size Booth
- One Table, Two chairs, One electrical point provided



- Exhibition Form
- Commercial form, published articles, prototypes, models, plans, drawings, pictures.



AWARDS

- Participation Award
 - Medal Award, or Certificate or Recognition
- Category B
 - Novice Special Award
 - Outstanding Novice Special Award
- Category A
 - Junior Special Award
 - Outstanding Junior Award
- Category C
 - Professional Special Award
 - Outstanding Professional Award

- **OVERALL WINNER FOR IRIISE 2018**
- **IRIISE Diamond Award**

FEES & INFORMATION

Category A (Local: RM200 International: USD50)

Primary & Secondary school students
One (1) Teacher & five (5) students max

Category B (Local: RM350 International: USD100)

Certificate, Diploma, Undergraduate (Local / International students)

Category C (Local: RM500 International: USD140)

Professionals/Industry, Educators, Postgraduate, Societies & Government and Private Institutions

PAYMENT TO

BENDAHARI UNIVERSITI MALAYA
BANK: CIMB Cawangan Universiti Malaya
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CONTACT US



SECRETARIAT OFFICE

IRIISE 2018
INTERNATIONAL RESEARCH INNOVATION, INVENTION & SOLUTION EXPOSITION 2018

Faculty of Built Environment
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CONTACT INFORMATION

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Website: <https://umconference.um.edu.my/iriise2018>

6 July 2018

**Registration &
Abstract Deadline**

13 July 2018

**Acceptance
Notification
(Accepted only)**

31 July 2018

**Registration
Fees Deadline**

**14-16
AUGUST 2018
EVENT DATE**



**UNIVERSITY
OF MALAYA**



#IRIISE2018



UNIVERSITY OF MALAYA RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

How to apply

For UM staff, non-medical research ethics can be applied directly through UM portal. For students, research ethics can be applied manually by submitting softcopy and hardcopy applications directly to the UMREC office. Please view our website for more info:

<https://www.um.edu.my/research-and-community/information-for-researchers/research-governance/um-research-ethics-committee>

Contact information

umrec@um.edu.my

Level 2

Institute of Research Management & Monitoring (IPPP)

University of Malaya
50603 Kuala Lumpur

The University of Malaya Research Ethics Committee (UMREC) was established to undertake review of all non-medical research involving human participants including funded and unfunded research. The main objectives of UMREC are as follows:

- To observe and promote the principles of integrity in scientific and scholarly research
- To provide clear policies and procedures, training and mentoring of researchers, and robust management methods that ensure awareness and application of high standards as well as early identification and, wherever possible, prevention of any transgression.
- To maintain public trust and the integrity of research carried out and developed in the University of Malaya.

UMRC RUN 2018



Get your running shoes ready and join us for a run around UM



umresearch.um.edu.my



RESEARCH PARTNERSHIP FOR SOCIETAL IMPACT

University of Malaya (UM) has fostered a strong tradition of research and development since its establishment, producing numerous world-class breakthroughs in various fields of science and technology. As Malaysia's premier Research University, UM is gearing up to be a major global player in research and innovation. UM is actively engaging in research collaborations and partnerships to share and capitalize on leading-edge research. With this objective in mind, UM will be organizing the University of Malaya Research Carnival 2018 (UMRC 2018).

umresearch.um.edu.my

PITCH FOR YOUR PROJECT

HIGHLIGHTS!

Pitch Your Research Projects Challenge

Keynote Speech -
Prof. Dr. Ihsan Sabuncuoğlu
(Rector of the Abdullah Gül University, Turkey)

3 minutes Thesis Winners Presentation

Cleanovation - Meet the Scientist and Icon

Research Aesthetics - Exhibition of UM Products

UMRC RUN 2018 - Exciting Duathlon (Running & Cycling)

And more...



UNIVERSITY OF MALAYA

UMRC 2018

UNIVERSITY MALAYA RESEARCH CARNIVAL

**15 - 17 NOVEMBER 2018
UNIVERSITY OF MALAYA
KUALA LUMPUR**

RESEARCH PARTNERSHIP FOR SOCIETAL IMPACT

Institute of Research Management & Services

Research Management & Innovation Complex,
University of Malaya, 50603 Kuala Lumpur



UMRC 2018 objectives:

Spearhead research -
Showcasing outstanding UM researches and highlight its impact on society and nation

Build bridges - Key UM event for building meaningful networks and linkages between researchers and communities

Engaging science - Foster multidisciplinary discussion among researchers

We promise a myriad of fun and excitement for researchers and public.

Welcome to the **UMRC 2018**.

UMRC 2018

UNIVERSITY MALAYA RESEARCH CARNIVAL

**15 - 17 NOVEMBER 2018
UNIVERSITY OF MALAYA
KUALA LUMPUR**

IAU 2018 INTERNATIONAL CONFERENCE

HIGHER EDUCATION PARTNERSHIPS FOR SOCIETAL IMPACT

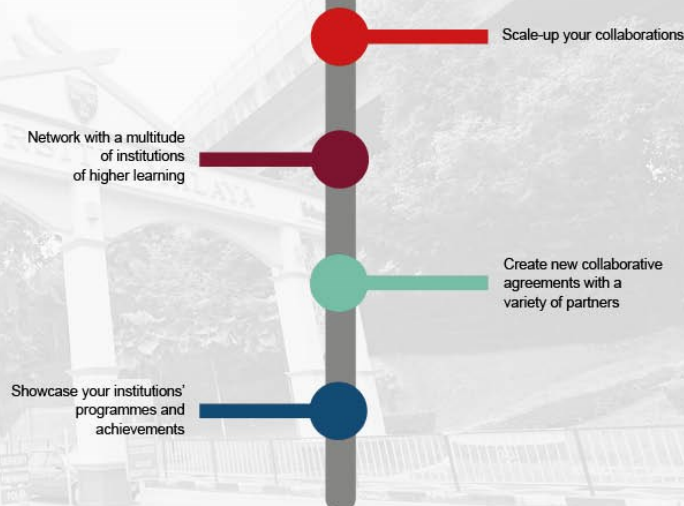
13-15 NOVEMBER
KUALA LUMPUR
MALAYSIA



WHY YOU SHOULD ATTEND



THE ADDED VALUE



Host and Partner



www.etouches.com/iau2018

e-mail: iau2018@um.edu.my

MEET THE SPEAKERS



Zakri Abdul Hamid
Science Adviser to the Prime Minister of Malaysia



Lesley Wilson
Secretary General
European University Association (EUA)



Khoo Kay Kim
Malaysian Renowned Historian
Recipient of Malaysia Eminent Scholar, 2016



Mazlan Othman
Director, International Council for Science Regional Office for Asia and the Pacific (ROAP), Malaysia



Josep M. Vilalta
Executive Secretary
Catalan Association of Public Universities (ACUP) and
Executive Director, Global University Network for innovation (GUNI), Spain



Sijbalt Noorda
President
Magna Charta Observatory, Italy



John Thwaites
Chairman
Monash Sustainable Development Institute & Climate Works, Australia



Johan Mahmood Merican
Deputy Director General
(Human Capital)
Economic Planning Unit (EPU)
Prime Minister's Department, Malaysia



Francisco Marmolejo
Lead, Global Solutions
Group on Tertiary Education
and Lead Education
Specialist for India
The World Bank Group

REGISTRATION FEES

Online registration is open from 1 April to 4 November 2018.

IAU Members	Early bird rates: Until: 1 Sep. 18	Full rates: After: 1 Sep. 18	On-site rates: 13-15 Nov. 18
IAU Members	350.00 €	500.00 €	500.00 €
IAU Affiliates & Associates	450.00 €	600.00 €	650.00 €
Non Members	550.00 €	700.00 €	700.00 €
Representatives from ASEAN HEIs	250.00 €	250.00 €	250.00 €
Conference dinner	50.00 €	50.00 €	50.00 €

Payments of early-bird registrations must be received by IAU not later than **1 September 2018**.

Registration fees include

- inaugural ceremony and welcome reception
- 2 days conference programme & access to all conference sessions
- conference documents and background documents
- wifi access
- breaks (x 4)
- lunches (x 2)
- badge and conference bag

Optional

Conference Dinner on 14 November 2018.

*Special rates
for ASEAN
participants*

and many more...please visit IAU 2018 website at www.etouches.com/iau2018 for more details.



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<https://www.um.edu.my/>

Available online at
[https://www.um.edu.my/research-and-community/our-impact/
research-bulletin](https://www.um.edu.my/research-and-community/our-impact/research-bulletin)

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