i-FoRST

Info from Faculty of Resource Science and Technology

UNIVERSITI MALAYSIA SARAWAK
UNIMAS

(ICOS) 2016

INTERNATIONAL CONFERENCE IN ORGANIC SYNTHESIS

Public Lecture
Prof Ei-Ichi Negishi

MoU Between UNIMAS
&
Shell MDS (Malaysia) Sdn.Bhd

MoU Between UNIMAS
&
MyInnoHub

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Dean's Message

I warmly welcome you to the FRST and the last issue of i-FoRST for 2016.We have been very active and fruitful during the first half of the fiscal year [2016-2017]. And, in this 7th volume of i-FoRST, I would like to share with you the latest news about the faculty and its activities. On campus our faculty members and students enliven the lecture rooms and hallways. Our academicians are dedicated to assisting student in their academic pursuits as well as helping them find their hidden intellectual strengths and passions. Indeed, fostering success of students is the very core of the faculty's mission. We strive to provide students with opportunities to succeed by organizing a number of scholarly events such as public lectures, international conferences and workshops. One of the most significant event was a public lecture by a Nobel Laureate winner in Chemistry, Professor Ei-ichi Negishi of Purdue University, USA held at PITAS on 17th August 2016.

Students' involvements in these events have certainly complemented and enhanced their educational, social, and relational experience in UNIMAS. Beyond campus, in line with the university's strategic plan, we partner with members in the same field of expertise, to create opportunities for collaboration. A number couple of MOUs between UNIMAS and industrial partners recently signed had signified the involvement of our departments and programs in industrial engagement. In September 2016, the faculty received about 550 new enrolment including 4 international students. And on 17th of November 2016, a total of 667 students including postgraduates will be receiving their scroll during the 20th Convocation. The faculty feels very proud that 13 of our students will be conferred PhD, the highest number so far. CONGRATULATIONS.I invite you to read the rest of the content in this issue and we look forward to keeping you posted on our progress on each of these vital fronts, and on the remarkable accomplishments of our students, faculty, and alumni.

Assoc. Prof. Dr Othman Bojo
Dean

CONTENT

FRST

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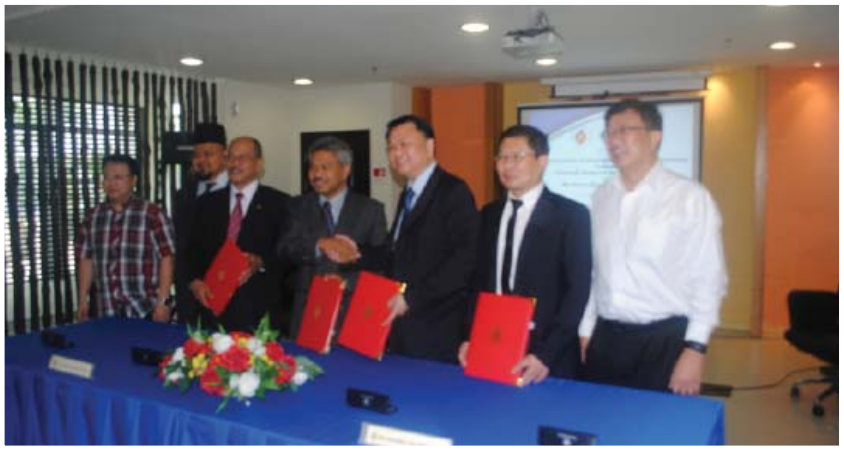
MOU

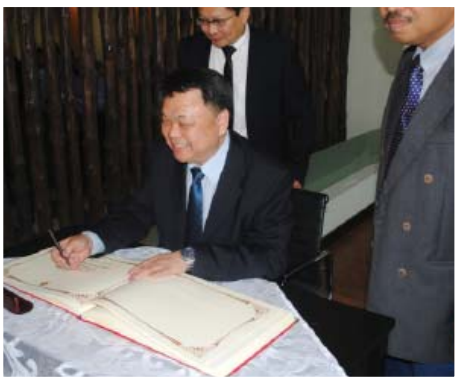
Universiti Malaysia Sarawak (UNIMAS) and My Innovation Hub

The Faculty of Resource Science and Technology, UNIMAS has signed a Memorandum of Understanding (MoU) with My Innovation Hub (MyInnoHub) on 11 April 2016. Present for the MoU signing was YBhg Prof. Mohd Fadzil Abdul Rahman, Deputy Vice Chancellor (Student Affairs & Alumni), UNIMAS and Assoc. Prof. Dr Othman Bojo, Dean, Faculty of Resource Science and Technology, UNIMAS while MyInnoHub were represented by Mr Vincent Wong Wai Sang, Chief Executive Officer of MyInnoHub and Dato' Dominic Su, Chief Executive Officer of Regal International Group.

This MoU was initiated based on early presentation by UNIMAS researchers which was conducted on 29 February 2016. Following that, an interest in sago related project was further taken up by MyInnoHub. Thus, UNIMAS was invited to a further meeting and presentation in MyInnoHub office in Kuala Lumpur. In the discussion, they showed interest in two sago related project and another two innovative products developed by UNIMAS researchers. Other related projects are the sugar conversion from sago starch (FRST & CoSAR), development of mechanical harvesting of sago palm (CoSAR & FE), road construction technology (FE) and innovative methodology of teaching of English (FHMS & FCSHD), plus two additional CoSAR products on conversion of sago waste into furniture and oil spill cleanup kit.

UNIMAS, with a strong research-oriented agenda, has long started the research on sago palm and with a pool of technical expertise and scientific competence, would be able to carry out R&D activities required to boost and achieve the full economic potential of sago in Sarawak. With respect to the lightweight concrete system developed by UNIMAS, it is also UNIMAS efforts to support the State Government in building a good infrastructure on peat soil. Since 2006, UNIMAS set up a research team to study road construction on peat soil and Foam-ERP road system is UNIMAS new innovation to the industries. For the Pan Borneo Highway project alone, majority of the road construction on peat soil is in the southern region. Thus, UNIMAS should be ready to contribute on those projects by developing the Foam-ERP road system.





Memorandum of Understanding (MOU) between Universiti Malaysia Sarawak and Shell MDS (Malaysia) Sdn. Bhd

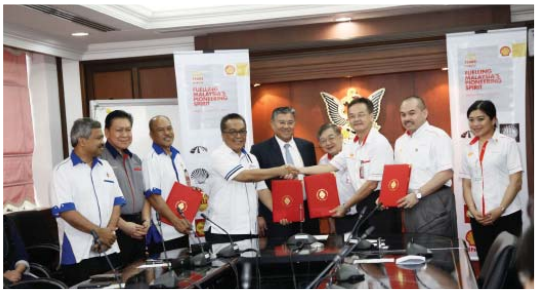


Photo by - UNIMAS Official Photographer

The collaboration between Shell (Malaysia) and Universiti Malaysia Sarawak (UNIMAS) dates back to the early founding days of UNIMAS, in the mid-1990s. Shell Malaysia was bold to have sponsored the Shell Research Chair which was devoted to research on biodiversity and environmental conservation. As beneficiary of the prestigious Research Chair, UNIMAS assured the best experts to take on the role a recipient of this research fund.

On 28th March 2016, a Memorandum of Understanding (MoU) between Shell (MDS) Malaysia Sdn. Bhd. and UNIMAS was signed in a ceremony at Wisma Bapa Malaysia, Petra Jaya, Kuching (Sarawak) which represented a second major collaboration between both parties. Witnessing the signing ceremony was Sarawak State Secretary, YB Tan Sri Datuk Amar Morshidi Hj Abdul Ghani, who is a member of UNIMAS' Board of Directors. Signing on behalf of UNIMAS was its Vice Chancellor, Prof. Dato' Dr Mohamad Kadim bin Suaidi, and Dean of the Faculty of Resource Science and Technology, Associate Prof. Dr Othman bin Bojo. Also represented UNIMAS in the ceremony were the Deputy Vice Chancellors, Prof. Mohd Fadzil Abdul Rahman and Prof. Dr Kopli Bujang. Mr Tom Wong, General Manager of SMDS Sdn Bhd, and Mr Jonathan Jolly, Senior Manager of Government Relations, Shell Malaysia, signed on behalf of Shell, accompanied by Shell Malaysia Managing Director, Mr Liang Kok Siang.

Aside from research activities, the current cooperative engagement entails commitment by both parties in the development of human capital. The collaboration will focus on career opportunities and skill enhancements of UNIMAS graduates as well as the staff. The main objectives of the MOU are to formally initiate relationships in these areas of interests;

· Joint efforts in the development of UNIMAS undergraduates and postgraduates in terms of career opportunities, including enhancement of soft skill attributes and exposure to job prospects at Shell,

· Internship opportunities for qualified staff and students at Shell MDS,

· Special awards by Shell to UNIMAS students with outstanding achievements.

· Collaboration on research and development or technological work that is of mutual benefit to both parties, including product development efforts/projects.

International Conference In Organic Synthesis ICOS 2016

Photo by - UNIMAS Official Photographer

From 22nd until 23rd August 2016, UiTM Shah Alam in collaboration with Department of Chemistry, Faculty of Resource Science & Technology had organized the International Conference in Organic Synthesis (ICOS) which was held at Riverside Majestic Hotel, Kuching. It was the first scientific meeting for international organic chemistry community held in Kuching, Sarawak. There were 42 oral presentations conducted and 29 posters presented during the two days conference by various institutions in Malaysia such as Universiti Teknologi Malaysia (UTM), Universiti Teknologi Mara (UiTM), Universiti Malaysia Sarawak (UNIMAS), International Islamic University Malaysia (IIUM), Universiti Malaya (UM), together with the international institutions from Taiwan, Japan and India. Two plenary speakers; Prof. Dr Minoru Isobe from Chulabhorn Research Institute (CRI) Bangkok and Prof Biing-Jiun Uang from National Tsing Hua University, Taiwan and seven invited speakers; Prof Dr Hadi Nur from UTM, Prof. Dr Hasnah Osman from USM, Prof Dr Noorsaadah Abd Rahman from UM, Prof Liang Chienng from Institute of Chemistry Chinese Academy of Sciences, China, Prof Katsunori Tanaka from RIKEN, Japan, Prof Xuefeng Jiang from East China Normaal University, China and Prof Lin Guoqiang from Shanghai Institute of Organic Chemistry, China were invited to share their research throughout the conference.

The conference was officiated by Datu Len Talif Salleh, Assistant Minister of Workforce Development and Training, and Assistant Minister for Environment, Sarawak during the conference dinner reception on 22nd August 2016. The conference ended with a post-conference visit to Sarawak Cultural Village on 24th August 2016.

– Amira Satirawaty bt Mohd. Pauzan and Dayang Norafizan binti Awang Chee

Nobel Laureate Prof. Ei-Ichi Negishi

- Public Lecture

Institut Kimia Malaysia (IKM) and UNIMAS had organized a public lecture by Prof Ei-Ichi Negishi on 17th August 2016 at Lecture Hall, PITAS, UNIMAS. Prof Ei-Ichi Negishi, H. C. Brown Distinguished Professor of Chemistry, Purdue University was a nobel prize winner in Chemistry in 2010. The lecture entitled "Pursuit of My Dreams for Half-a-Century" was a successful event attended by almost 300 audiences from UNIMAS students and staffs as well as other institutions such as Universiti Teknologi Mara (UiTM) Cawangan Sarawak, high school students around Kota Samarahan and Lodge International School students. UNIMAS was honored to have Datuk Patinggi Tan Sri (Dr) Alfred Jabu Ak. Numpang, Assistant Minister for Science Research and Biotechnology Sarawak together in the event. Prof. Negishi shared his valuable journey towards the Noble Prize.

When he was asked on "What makes him happy?", he replied "happiness" must consists of four components which are:

- Good health
- Happy surroundings including one's own family and beyond
- Selection and pursuit of a worthy professional career
- One or more enjoyable and lasting hobbies

– Amira Satirawaty bt Mohd. Pauzan and Dayang Norafizan binti Awang Chee

Photo by - UNIMAS Official Photographer

Microscale and Green Chemistry Workshop

A microscale and green chemistry workshop was held in Faculty of Resource Science and Technology (FSTS) on 18th August 2016. The workshop was a joint activity between Faculty of Resource Science and Technology (FRST) UNIMAS, Institut Kimia Malaysia (IKM) and Federation of Asian Chemical Societies (FACS). The training was conducted by Prof. Ogino Kazuko (Tohoku University, Sendai, Japan), Prof. Supawan Tantayanon (University of Chulalongkorn) and Prof. Datin Zuriati Zakaria (UTM). Lecturers, undergraduates and postgraduate students from FRST, UiTM Kota Samarahan, and Institut Perguruan Guru Kota Samarahan took part in the one day workshop. Similar event was successfully held in Thailand during the 14th Asian Chemical Congress.

The workshop focused on the usage of smallest possible scale to replace the usual scale traditional lab experiments where subject to limitations such as limited equipment and glassware, and usage of high amount of reagents. The advantages of these microscale experiments are students can do experiments on their own and are exposed to less hazard, shorter time to conduct the experiments and generate far less waste.

– Amira Satirawaty bt Mohd. Pauzan and Dayang Norafizan binti Awang Chee

THE PENCIL IS Mightier Than The Sword!

Many creative and intellectual minds such as the polymaths da Vinci, Galileo or Darwin were able to study the laws of science and nature whilst also dabbling in inventing, painting and engineering due to their innate skills to observe. Sketching can help to enhance keen observation and improves perception through uses of the many physical and visual senses.

On 16th March 2016, the Department of Aquatic Science organized a hands-on and interactive sketching course which received excellent feedback from participants. Sketch Aquatic was held for the first time, and the lifelong learning program was open to members of the public aged over 15. Facilitators were free-lance designer Ms. Jean Voon and Faculty lecturer Dr. Aazani Mujahid.

After a short briefing on the basics of scientific observation, participants were involved directly in learning tips and techniques of basic sketching. Live samples of selected aquatic fauna including a variety of fishes and prawns were sketched using a few different but simple techniques for participants to hone their skills. Many rose to the challenge and were surprised they were able to sketch the organisms without prior artistic skills.Due to the demand from interested participants, the Department foresees the Sketch Aquatic event to be held at least twice yearly. Interested to know more? Visit us @ *www.facebook.com/ sketchaquatic2016/*

- Aazani Mujahid

OVERSEA CONFERENCE

The 8th World Congress of Herpetology (WCH8) had been successfully held from 14th to 21st August 2016, in spite of last minute change of venue (made known to participants two days before it all begun) from HongZhou City to a smaller town 200km away called TongLu. This huge gathering of world herpetologists happens only once every four years. WCH8 had managed to bring together approximately 800 herpetologists in one location, in which more than 500 talks were carried out in 7 concurrent sessions, on daily basis. A total of 9 plenary were delivered by renowned herpetologists (ranging from 2 or 3 plenary per day). It is so proud to see UNIMAS logo during one of the session entitled "Ethnoherpetology: Perspectives and Conservations" by Prof Dr Indraneil Das (IBEC). From FRST, two talks were given on separate sessions as follow:

1.Research Notes on the Wild Tomistoma populations in Western Sarawak,
Malaysian Borneo by A P Dr Ruhana Hassan

2.Awareness Programme on Green Sea Turtle in Sarawak, Malaysia by PhD student Ms Nurhartini Kamalia Yahya

On the evening of 16th August, all participants were invited to attend a local stage play entitled 'Moonlight on the Spring River'. This was an amazing and awesome play, full of local features, combining traditional stage ideas and modern technology stage art. Besides talks, on 17th August, one consultation session was carried out by the editors of seven selected journals related to herpetology, aimed to motivate and encourage young herpetologists to publish articles journals. One field excursion was carried out on 18th August, visiting several tourist attraction sites including a local village which have become a model for sustainable living.

- Ruhana Hassan

FRESHWATER MUSSEL Expedition 2016

Freshwater mussels inhabit aquatic habitats across the globe, but are considered one of the most endangered animal groups. Due to the lack of data, the conservation status of the majority of the species has yet to be assessed by the IUCN. Consequently, not a single Malaysian freshwater mussel species is currently protected by law. Recently, Assoc. Prof. Dr. Khairul Adha A. Rahim from Department of Aquatic Science has participated in the freshwater mussel expedition from 28th of July to 8th of August 2016 in Ulu Baram, Belaga and Sibu areas. The expedition was led by Dr. Alexandra Zieritz, a Research Fellow at the University of Nottingham Malaysia Campus. The project was also conducted in collaboration with overseas collaborators such as Manuel Lopes-Lima, Head of the IUCN Freshwater Bivalve Specialist Group, University of Porto, Portugal, Prof. Ronaldo Sousa, University of Minho, Portugal and Dr. Arthur E. Bogan, Research Curator of Molluscs, the North Carolina Museum of Natural Sciences, USA.

Among the objectives of this project were to develop a National Red-list of freshwater mussels of Malaysia, according to IUCN criteria, to identify the most vulnerable species and to raise awareness and train local expertise in order to secure the future survival of mussels and their ecosystem function. Fieldwork in Peninsular Malaysia and Sabah were already completed. One manuscript from the mussel project with the title "Factors driving changes in freshwater mussel (Bivalvia, Unionida) diversity and distribution in Peninsular Malaysia" has been accepted to be published in Science of the Total Environment Journal. This project is funded by The Mohamed bin Zayed Species Conservation Fund, UAE.

- Khairul Adha A. Rahim

WHO ARE RICE BREEDERS ?

Rice is the staple food for Malaysian. Rice breeding/improvement is crucial, not only to meet the demands of consumers but also farmers. For consumers, the rice qualities that they are looking for, are after-cook-texture, aroma, taste and nutrient content. For farmers, they are looking for varieties with high yield (harvest), resistant/tolerant to biotic and abiotic stresses and homogeneity, just to name a few. A rice breeder needs to be an artist as well as a scientist to create rice variety which can fulfil most, if not all, the demands of consumers and farmers. The art is the creativity in creating a new variety. The science is the know-how in creating a new variety.

All the rice quality stated above are governed by gene(s) or interactions between genes. Genes are like the Lego blocks of rice breeder. Each rice variety in the commercial rice production areas, subsidiary rice fields and in the wild, has a unique set of Lego blocks which usually is a mixture of desirable and undesirable blocks. Firstly, rice breeder has to discover the desirable Lego blocks in each variety. Then, a strategy is designed to accumulate desirable Lego blocks from different rice varieties to create a new variety. Sounds simple, but it is complicated. To make things worse, rice breeding is not a one-time effort. This is due to the dynamics of consumer demands, the dynamics of biotic and abiotic stresses and others.

Rice grains ready to be harvested.

Even though rice breeders can create new varieties with good qualities, consumers and farmers have to do their parts too. New rice varieties can only achieve their true potential if the farmers are following the recommended agronomic practices and the consumers are following the cooking guide.

The skills in the art and science of a rice breeder can help the rice productions in Malaysia. Unfortunately, the number of rice breeder in Malaysia is only a handful. We WANT various technologies to improve our quality of life, but we NEED plant (rice) breeders and other plant scientists to sustain our life.

- Freedy Yeo

Early planting season

Rice seedlings transplanted into the field.

Disease and pest inspection.

Wildlife Photography

- Types Of Lighting -

Photographing wildlife in the rainforest can be very challenging. First, the quantity of light is considerably low at the understory level which makes it difficult to get a sharp picture at base ISO settings (see previous article on iForst 3 – Balancing Exposure). Second, the patchiness pattern of canopy cover resulted in unbalance light penetration with some areas tend to be under-exposed while others become over-exposed. For these reasons, artificial light source from lighting equipment such as flash or strobe is vital. Knowing how to manipulate artificial light into creative lighting will help photographers to improve their wildlife images.

Figure 1: Close-up shot of harlequin tree frog (*Rhacophorus pardalis*)

Figure 2: Distance image of proboscis monkey (*Nasalis larvatus*)

Figure 3: Portrait of a spider using diffused soft light

The most important characteristic of artificial light can be broken down into two aspects, the quantity and the quality. The quantity of light is crucial to produce a decent well-exposed photo while the quality of light usually determine how aesthetically beautiful the photo is. Although the quality of light can be deemed as very subjective, it can be roughly categorized according to scattering pattern, direction and tint of the artificial light source. This article will only cover the first category which focuses on the light scattering pattern.

The light scattering pattern can generally be classified into two categories; a hard light and a soft light. A hard light is produced when the light scattered in a uniform pattern. This type of scattering pattern can be produced by projecting the light from a small and distant light source. The light on a bright sunny day is an example of natural hard light which resulted in high contrast image with sharp shadow characteristic. A soft light on the other hand is produced when the light scattered in un-uniform pattern. This type of scattering pattern can be produced by projecting light from a wide or close source. The light from overcast sky is an example of natural soft light where the cloud diffuses and spreads the sunlight into a large area in the sky and therefore resulted in a low contrast image with smooth shadow transition. A hard light can be used to bring-up the texture and contrast of the image while a soft light can be used to create even lighting with soft transition between the high contrast and lowcontrast parts of the image.

For close-up shots, a soft light is preferable in order to eliminate shadows and soften the image contrast. The reason is because the presence of shadows and high image contrast tend to appear unpleasant where there are chaotic background elements such as leaves and branches. Therefore, an artificial light source that is relative wide and close to the subject is useful for this purpose. A simple way to achieve this in the field is by using a diffuser or a soft-box attached to a flash unit that is then placed very close to the subject.

Meanwhile, a hard light concentrate more quantity of light over distant and therefore suitable to be used as fill-flash in a backlit situation or when the subject is far away. This is particularly useful for photographing bird or arboreal animals on tree branch where the sky light penetrate from

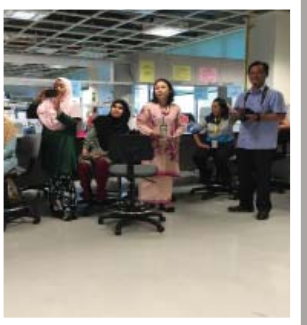
– Radiozaman Sulaiman

Figure 4: Detail of spider web using hard light

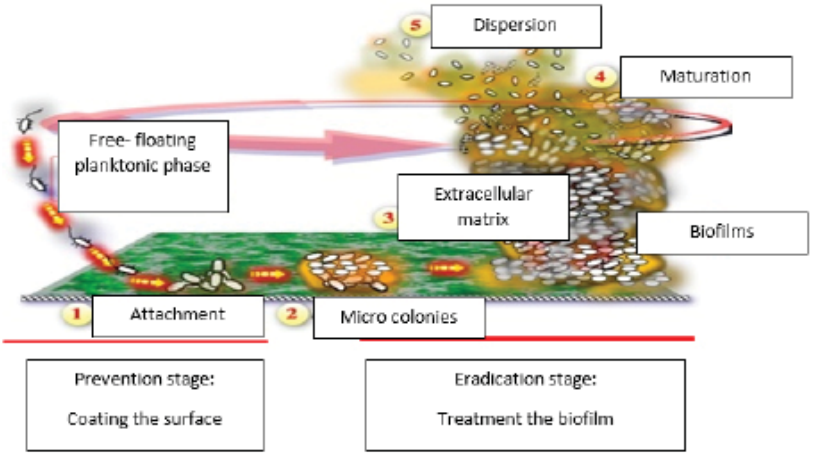
ENHANCEMENT OF BASIC MICROBIOLOGY AND MOLECULAR SKILLS

From 3rd to 4th August 2016, the Department of Molecular Biology had organized a workshop on Enhancement of Basic Microbiology and Molecular Skills which took place at the Faculty of Resource Science and Technology. It was officiated by the Head of Department of Molecular Biology, Dr. Micky Vincent. Twelve lecturers were present during the two-day event as speakers and lab demonstrators. The workshop was also made a success with the assistance of a few of the faculty's supporting staff.

The participants for this workshop were from civil agencies that came to acquire basic skills and enhanced their knowledge in fundamental aspect of good microbiological practices in the laboratory. The skills and knowledge taught include aseptic techniques, bacteria isolation, enrichment and incubation as well as to develop an understanding on biochemical and molecular methods used in microorganism identification. At the end of the workshop, all of the participants have expressed their satisfactions with the acquired knowledge. Thus, all of the staff from the Department of Molecular Biology hope that the insights they obtained throughout that two days can be properly implemented at their research institutions.



Do you know what bacterial biofilm is ?



Stages in biofilm formation

Biofilm is a structured community of microorganisms contained in self-developed polymeric matrix and comply living on inert surface. It is often characterized by surface attachment, structural and genetic diversity, complex community interactions, and extracellular matrix polymer. Some researchers describe biofilm as "a community of cells attached to a surface or interface or to each other, imbedded in a self-made, protective matrix of extracellular polymeric substance (EPS)". Unicellular organisms generally display two different modes of behavior. As shown in Figure below, the first is the familiar free floating, or plankton form, in which single cells float or swim independently in liquid medium.

Due to four major advantages, biofilm formation constitutes an efficient adaptive strategy for (I) protection from adverse environmental factors, (II) increased availability of nutrients for growth, (III) increased binding of water molecules to reduce the possibility of dehydration, and (IV) proximity to progeny and other bacteria by facilitating higher rates of DNA transfer. All these circumstances can increase the survival of bacteria. As a result, inactivation of these bacteria with antibiotics or disinfectants is often ineffective.

Congratulations

FRST congratulates Prof. Dr. Kopli Bujang who has been bestowed with Johan Bintang Kenyalang (JBK). The award was conferred by His Excellency (HE) Tun Pehin Sri Haji Abdul Taib Mahmud at Astana Negeri on September 10th 2016.

New Appointment

Dr Teng Sing Tung
DS45

Dr. Roslianah Asdari
DS45

Dr. Fathurahman Lanana
DS45

Staff Transfer

Nana Lias
(Transfered to Faculty of Language Studies & Communication Studies)

Dabif Jack Shaw
(Transfered to Faculty of Language Studies & Communication Studies)

Selina Jawawi
(Transfered from Faculty of Medicine & Health Sciences)

Abd Karim Johari
(Transfered from Development Division)

Tanuri Men
(Transfered to Chancellory Division)

Philip Christopher Jitam
(Transfered from Development Division)

Meria Rantis
(Transfered from Faculty of Social Sciences)

Rusmaine Masdi
(Transfered to UNIMAS Clinic)

NGABANG RAYA 2016 (19 JULY 2016)

OFFICE CLEANLINESS ACTIVITY (3 - 9 AUGUST 2016)

HARI BERSAMA FAKULTI MINGGU ALUAN PELAJAR 2016/2017 (1 SEPTEMBER 2016)

FRST DEAN CUP 2016 (10 - 13 OCTOBER 2016)

UNIMAS BOARD OF DIRECTORS MEETING (10 AUGUST 2016)

STUDENT REPRESENTATIVE COUNCIL 2016/2017 (E-VOTING) (20 OCTOBER 2016)

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