

Malaysian Society for Microbiology

THE MALAYSIAN Society for Microbiology

E-BULLETIN

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or contact us at microbsociety@gmail.com

FROM THE DESK OF THE PRESIDENT



Assalamualaikum and dear all,

Since the advent of the COVID19 pandemic, effective communication is pivotal towards streamlined mitigation and crisis management nationwide. The implementation of restrictions has impeded societal conducts such as our annual symposia and workshops, but serendipitously enabled us to embrace a more creative approach towards knowledge and information sharing within the MSM. On behalf of the MSM Executive Committee, I would like to extend our warmest greetings via the inaugural society e-bulletin!

Though the MSM has been predominantly operating via online presence in the previous fiscal year, we continue to be committed towards upholding our mission of advancing microbial research in Malaysia for the betterment of societal well-being. In addition to the virtual occurrences of both the MSMPS 2021 and ICMSM 2021, the society has also successfully organised the MSM Pecha Kucha competition, and extended our collaboration with JAMSKL for a number of their webinars since 2020. The MSM was also the strategic partner for the National Science Challenge 2021, where we presented our first Microbiology Award. The EXCO is hard at work drafting more exciting endeavours for our members and the research fraternity, where we have introduced the MSM Working Groups during the 2020/2021 Annual General Meeting on December 2021.

It is our aspiration that this personalised medium can be a platform to be leveraged by every member of the society; through presentation of new advancements and highlighting personalities in the field of Microbiology, postings of events, as well as sharing important information that can benefit a multitude of entities. The Editorial Board of the e-bulletin welcomes participation and contributions from our members, hence, together let's make this space a launchpad for a more inclusive and wonderful avenue for the growing family of MSM.

Lastly, we hope all our members are in the best of health and being. Stay safe and please adhere to the SOPs in place during these tough times, and as we learn to live in the age of the COVID19 endemic – may we always find opportunities in the face of adversity. Thank you and best wishes from us.

ASSOC. PROF. DR. MAS JAFFRI MASARUDIN MSM President 2021/2023





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MSM ACTIVITIES 2019-2021

MSM POSTGRADUATE SYMPOSIUM (MSMPS2021)

MSMPS2021 was held virtually on June 9-10, 2021, with more than 100 attendees. The event was officiated by the MSM President two keynote speakers and delivered their inspiring talks. Themed 'New Microbial Research in New Era', 20 speakers presented new findings in the fields of medicine, agriculture, environment, food, industry, molecular and general microbiology. Unlike the traditional "sit, listen and go" conference, the MSMPS virtual provided symposium an experience interactive for attendees. The symposium was sponsored by Peat Organics, Agensi Nuklear Malaysia and **Biolution Resources.**





INTERNATIONAL CONGRESS OF THE MALAYSIAN SOCIETY FOR MICROBIOLOGY (ICMSM2021)

ICMSM2021 was held from September 29 to 30. This two-day event was conducted virtually for the first time and was jointly organised by Monash University Malaysia and MSM. The event was officiated by the President and Pro-Vice Chancellor of Monash University Malaysia, Professor Andrew Walker. The ICMSM2021 was attended by 225 participants from 13 IPTAs, 14 IPTSs and 13 government institutions. Two keynote speakers and 7 plenary speakers delivered their inspiring lectures in the fields of medicine, agriculture, environment, food, industry, molecular and general microbiology. There were also 35 oral presentations and 60 short talks given at the conference. Participants found the conference very interesting and relevant as many current issues were discussed.

MSM GIVES BACK: PPE Donation to Hospital Serdang

On July 1, 2020, MSM donated some protective equipment such as face shield, masks and gloves worth RM 4960 to Serdang Hospital to support and show appreciation to our frontliners. The equipments were delivered by Assoc. Prof. Dr. Eddie Chia Suet Lin and Dr Adelene Song Ai Lian.



45th MSM ANNUAL **GENERAL MEETING** 2019/2020

The 45th Annual General Meeting was held on 15th December 2020, attended by 48 members. At the meeting, the 2019/2020 MSM Annual Report was presented and amendment of the MSM Constitution was also discussed.



JAMSKL-MSM WEBINARS

JAMSKL-MSM Webinar Series is a platform for senior and young researchers to showcase their research, organised by the Joint Academic Microbiology Seminars Kuala Lumpur (JAMSKL) in collaboration with MSM. Due to the Covid19 pandemic restrictions, the initial in-person meeting was moved to online mode. The webinar features prominent microbiology researchers presenting their findings. MSM has contributed RM_1500 to JAMSKL for co-organizing this webinar.

Speakers for 2020:

- eakers for 2020: Tee Kok Keng (UM) Natrah Ihsan (UPM) Sivachandran Parimannan (AIMST) Neoh Hui-min (UKM) Nazlina Haiza Mohd Yasin (UKM)
- Vanitha Palaeya Kesaven Bhubalan (UMT) Hesham Ali Enshasy (UTM) Vanitha Mariappan (UKM)

- Peer Mohamed (UKM) Sharifah Farhana (UQ)
- Khairiyyah Mohd Hanafiah (USM) Boo Sook Yee (Qiagen) Adeline Ting Su Yien (MUM)

Speakers for 2021:

- Rajesh Sani (South Dakota, US)
- Nurulfiza Mat Isa (UPM) Ho Ting Seng (Back to Nature) Chris Greening (Monash) Vanitha Palaeya (Qiagen) Michael Manefield (UNSW) Zetty Norhana Balia Yusof (UPM)

- Winona Wijaya (NTU) Sylvia Chieng (UKM) Chin Soon-Phan (NUS)





In 2021, MJM published a total of 6 issues [Feb, April, June, Aug, Oct, and Dec (in progress)]. All issues for 2021 were published both in print and online. The number of articles per issue was increased from 10 to 12. Of the total 60 articles published through Oct 2021, 38 articles (63%) were from local authors and 22 articles (37%) were from international authors.

A total of 194 articles were submitted by October 25, 2021, which is less compared to 2020 (323). Although a large number of submissions were received in 2020, the rejection rate was equally high (83%), resulting in only 30 manuscripts (9%) being accepted for publication. In contrast, in 2021, of the 194 manuscripts submitted, 26 (13%) were accepted for publication. This indicates that the rejection rate has decreased to about 64% (125 manuscripts) because the quality of submitted articles, especially from local authors, has improved significantly. This also demonstrates that MJM's rigorous peer review standards ensure that only high quality manuscripts are accepted.

THE MSM UNDERGRADUATE PECHA KUCHA CHALLENGE 2021

The 2021 MSM Undergraduate PechaKucha Challenge is the first-ever event hosted by MSM to replace the MSM Undergraduate Thesis competition due to the Covid19 pandemic. It featured compelling research by final-year undergraduate students at Malaysian universities in a six-minute, 40-second video presentation. PechaKucha, a presentation in which 20 slides are shown with images instead of words for 20 seconds each, allows the audience to enjoy a series of research presentations in a short period of time. Twentyfour students participated in this event with a wide range of topics, including microbial communities of sea cucumbers, boletoid fungi of Malaysian Borneo, bioinformatic screening of the NSP3 gene, and microorganisms that cause oral diseases. The winners were announced at the ICMSM2021 closing ceremony on September 30, 2021. The first prize went to Fathima Zahra Ozeer from Quest University with a PechaKucha video titled "Molecular Identification of Antiquorum Sensing Bacteria Isolated from Matana Mangrove Forest Reserve." Alice Lee Ern Ern from the University of Malaya won the second prize, while Nur Éatini from the International Islamic University of Malaysia won the third prize with their videos "Recurrent Dengue Outbreaks in Malaysia" and "Beware of Dirty Buttons", respectively. The PechaKucha videos of the 11 finalists were also posted on MSM's Facebook page. Mr. Ch'ng Han Seng won the most liked PechaKucha award with more than 500 likes.





Prof. Dr. Sudesh Kumar

Universiti Sains Malaysia

Q: Tell us about yourself. A: I am curious about everything.

Q: Motto, vision and mission in life? A: Keep learning, keep searching.

Q: What inspired you to pursue a career as an academician/ researcher in microbiology?

A: I like doing research and teaching.

Q: What are some of big achievements in your career that you are particularly proud of?

A: I don't have any big achievements. I think I have many small achievements that brought me to where I am now.

Q: What were the obstacles you had to overcome to achieve them? A: Convincing others.

Q: What are the challenges that you think will shape the microbiology research field over the next few years? A: A bacterial or fungal pandemic such as the emergence of pathogens that are resistant to antibiotics and all other currently known treatment methods.

Q: Your opinion about microbes?

A: Microbes are important for our survival.

Q: What do you enjoy doing in your spare time?

books that challenges my A: Read knowledge and encourages me to think differently. Go for a walk. Practice mindfulness.

Q: What is your advice to young researchers and middle-aged researchers on how to survive academia and research in Malaysia. A: Don't let publishing be your only motive to do research.

Q: Any other things that you would like to share with us?

A: Believe in science.

ARTICLES FROM MSM MEMBERS

Discovery of Streptomyces kebangsaanensis: A Journey to Reminisce

Prof. Dr. Noraziah Mohamad Zin Universiti Kebangsaan Malaysia

It all started when I first met Prof Gary Strobel, the father of endophytes way back in 2003 at an international conference in Yaman. His tremendous research output not only in the form of publications but securing American patents and bioactive commercial products were truly inspiring. The rest is history.



fungi and bacteria, which colonize the intracellular space of a host plant, normally causing no obvious harmful effect or symptoms of disease and can form a range of different relationships including symbiosis. Moreover, these bacteria can colonize multiple host species and live in all parts of the plants. Some of the endophytic microorganisms have the ability to produce bioactive secondary metabolites showing a variety of biological activities that suppress and kill various human pathogens. Streptomyces is a Gram-positive bacteria that are able to produce a wide range of secondary metabolites. At present, 66% of all known natural antibiotics are isolated from Streptomyces. Our research on endophytes started in 2005 after obtaining an IRPA grant. Two years later, we managed to publish the first article on bioactive endophytic Streptomycetes from the Malay Peninsula (FEMS Microbiol Lett. 274: 83-88). The journey continued to be more interesting with many plant sampling expeditions as well as a new research approach that included molecular work. It was not until 2012, that we coincidently isolated 'an average Streptomyces colony' (from Portulaca oleracea plant) that turned out to be a novel strain after a complicated identification procedure. We named it Streptomyces kebangsaanensis, in honour of UKM. In traditional medicine, Portulaca oleracea is used to relieve pain and swelling as well as used as an antiseptic.

Endophytes refer to a group of microorganisms, mostly

S. kebangsaanensis (formerly known as Streptomyces SUK 12) has whitish-gray aerial mycelia, greenish-yellow substrate mycelia and has rectiflexibile spore chain morphology. It has a highly potent antibacterial activity with the ability to inhibit up to 100% Bacillus subtilis ATCC 6633 and 40% Vancomycin Intermediate Staphylococcus aureus (VISA) Sa7. It also can kill some fungi such as Rhizoctonia solani and Geotrichum candidum, the plant pathogenic fungi and is able to inhibit Aspergillus fumigatus, the pathogenic fungi in humans. The 16s rRNA sequence of S. kebangsaanensis is currently deposited in the Gene Bank (HM 449820). It is also stored at the German Microorganism and Cell Culture Collection (S. kebangsaanensis DSM 42048T) and the Culture Collection Research Service Agriculture (S. kebangsaanensis NRRL B-24860T). S. kebangsaanensis was found to produce at least two types of phenazine namely tubermycin B and also 6-((2-hydroxyl-4methoxylphenoxyl) carbonyl) phenazine-1-carboxylic acid. The second compound was compared with other 9,921 phenazines that had been deposited in the database at the National Biotechnology Information Center (NCBI) and showed no similar structure. Thus confirming the structure produced is a new phenazine. Genomic analysis also showed that there is a different gene sequence responsible for the biosynthesis of new phenazine compounds which in turn has potential as a new antibiotic.

The Challenges of Pneumococcal Vaccines

Assoc. Prof. Ts. Dr. Mohd Nasir Mohd Desa Faculty of Medicine and Health Sciences Universiti Putra Malaysia

Covid19 pandemic has triggered an awareness on the importance of vaccination despite concern on the efficacy as the development of Covid19 vaccine takes place too fast to cope with the rapid spread of the virus. At the same time, other vaccine-preventable infectious diseases are being overshadowed although the associated deaths have been occurring persistently throughout the years. One of them is pneumonia which is also the characteristic of severe covid infection, and the causative agents are multiple. One of the causal agents is a Gram-positive bacterium, *Streptococcus pneumoniae* (pneumococci) and pneumococcal infection is very common in children, elderly and patients with comorbid diseases. One recent development in the prevention of pneumococcal diseases is the introduction of the newly pneumococcal conjugate vaccine (PCV) in Malaysia National Immunization Programme (NIP) starting in year 2020. The inclusion is supported by a majority of paediatricians for use in childhood immunization due to the alarming death rate associated with pneumococcal diseases in this young age group, not only in Malaysia but also worldwide.

Pneumococcal capsular serotypes are the major virulent factors required for host colonization and immune evasion of the upper respiratory tract. Therefore, capsular based vaccines have been the preventive measure for pneumococcal infection in high-risk groups since the beginning. The first pneumococcal vaccine was the old 23-valent pneumococcal polysaccharide vaccine (PPV) which was made up from 23 different purified capsular polysaccharides targeting the most common pneumococcal serotypes associated with diseases. Although currently there are a total of 100 different serotypes, but only a proportion is frequently associated with severe diseases.

Nevertheless, the drawback of PPV is the limited efficacy in children less than 2 years old due to poor immune response in this age group. The newly introduced vaccine, namely pneumococcal conjugate vaccine (PCV) is still based on capsular serotypes but conjugated to a carrier protein to increase the immunogenicity. The first PCV is the 7-valent pneumococcal conjugate vaccine (PCV7) covering serotypes 4, 6B, 9V, 14, 18C, 19F and 23F in year 2000, followed by PCV10 (additional serotypes 1, 5 and 7F) and PCV13 (additional serotypes 3, 6A and 19A). A recent Malaysian study at a major tertiary hospital showed the immunization coverage of serotypes at more than 70%, indicating the potential effectiveness of PCV13 in the population. A wider serotype coverage-PCV15 and -PCV20 are currently under clinical trials.





Assoc. Prof. Ts. Dr. Mohd Nasir Mohd Desa and his postgraduate student doing DNA extraction for gene studies

The efficacy of PCV needs to be monitored over the long run as the prevalence of serotypes may change. The effect of a vaccine targeting specific serotypes will suppress the existing targeted serotypes, resulting in selective pressure for the emergence of other serotypes not included in PCV. Such incidence has been reported involving serotype 19A during the post-PCV7/10 implementation globally. Serotype 19A is one of the most prevalent serotypes in some countries but it has now been included in PCV13. Serotype 19A has been associated with severe diseases to warrant concern for the continuous improvement of the current vaccines. There have also been studies reporting serotype-switch involving a pneumococcal genetic lineage of a serotype that re-emerges with a different serotype. Such capability is not alien in pneumococcus as it is known to be naturally transformable where under a favourable condition, pneumococci may take up foreign DNA fragments and incorporate them into its genome resulting in the emergence of strains with new genetic traits. This has also explained the phenomenon related to beta-lactam antibiotic resistance in pneumococci due to the acquisition of altered penicillin-binding protein genes that encode for the cell wall proteins. These variants exhibit altered cell wall component which is no longer recognized by beta-lactams. e.g., penicillin, and thus become antibiotic resistance.

In view of potential serotype distribution change associated with the implementation of serotype-based vaccines, a universal pneumococcal protein of medical importance would be appropriate as a future vaccine candidate. Virulence-associated proteins would be likely as they would be highly expressed during an infection course but should be widely present in commonly isolated serotypes. Interestingly studies have found that the common serotypes do carry a similar regiment of virulence-determinant genes. But there are variations in some virulent proteins associated with host adherence and invasion such as pneumococcal surface protein A (PspA). Current studies are focusing on the outcome of the variants in terms of pathogenicity and immunogenicity to serve as the best model for vaccine development. The involvement of serotypes in pathogenesis in combination with other virulence factors should also be investigated as the virulence potential of pneumococci is multifactorial involving growth capacity, gene expression pattern and the promoting factors which could be interrelated. Recent advances in NGS allowing comparative genomic of temporal pneumococcal isolates may elucidate the pathogenic evolution of pneumococci.

Pneumococcal growth on blood agar

MSM Member's SUCCESS STORY

DR. PHUA CHOO KWAI HOE

BIOFERTILIZER DEVELOPMENT USING NUCLEAR TECHNOLOGY

The biofertilizer development project at Nuclear Malaysia began in 2002, with earlier projects focusing on free-living N2-fixing bacteria, phosphate-solubilizing microbes and plant growth-promoting rhizobacteria (PGPR), as well as the production of gamma-sterilised biofertilizer carriers or substrates under the Forum for Nuclear Cooperation in Asia (FNCA) Biofertilizer Project.

Since 2006, a number of products have been developed. MULTIFUNCTIONAL BIOFERT PG & PA and MF-BIOPELLET were gammairradiated carrier biofertilizer products. Due to the limitation of carrier products, a series of liquid biofertilizers were developed and successfully commercialised. These were BIOLIQUIFERT and BIOLIQUIFERT M100 with Peat Organic Sdn. Bhd. and GOGROW BIONPK BIOFERTILIZER with Enviro Clean Energy Sdn. Bhd. and M99 BIOFERTILIZER with EGI Biotech Sdn. Bhd.

From 2014, projects are planned to focus on gamma irradiation to improve the activity of biofertilizers through mutagenesis and to test multifunctionality. A gamma irradiated biofertilizer product, BIONIK-P, has been developed and tested in greenhouse and field trials on various plants. An isotope technique (N15 bracket isotope) was also used to study nutrient uptake. Research and development (R&D) funding was successfully obtained from the Ministry of Science, Technology and Innovation (MOSTI) in 2007 and 2011 under the ScienceFund programme. The results of this project were presented at the annual FNCA workshop on the Biofertilizer Project. Nuclear Malaysia is instrumental in the preparation of the FNCA Biofertilizer Manual (2006) and the FNCA Guideline for Biofertilizer Quality Assurance and Control Volume I (2014) and is the Editor-in-Chief of Volume II (2018).

In terms of commercialization, different biofertilizer inoculants have carved different levels of success. In terms of Corporate Social Responsibility (CSR), Nuklear Malaysia is proud to announce that 770,000 litres (RM 13,090,000.00) of Bioliquifert has been supplied to rice farmers in Kedah, Perlis and Perak under the Incentive Paddy Production Scheme (Skim Insentif Pengeluaran Padi (SIPP)) under the auspices of the Ministry of Agriculture and Food Industry (MAFI). This achievement, albeit in its early stage, augurs well for the use of biofertilizers and emboldens good agricultural practices through the use of natural and organic products for improving food productivity, quality, and safety in Malaysia's agricultural industry.

To encourage researchers to pursue commercialization, Nuclear Malaysia has distributed RM 247,510.08 as royalties to inventors. Nuclear Malaysia also successfully copyrighted a trademark (Bioliquifert) and three standard operating procedures (SOP). The copyrights were SOP for the mass production of BIOLIQUIFERT, SOP for the setup and operation of the bioculture booster, and SOP for the production of the mother culture and mass production of AP1. In addition to R&D and commercialization, the Biofertlizer project also provides services such as quality control of biofertlizer products, microbial analysis, toxicity testing, and stable isotope analysis.





Hasil dari Projek Biobaja melalui kerjasama serantau Forum for Nuclear Cooperation in Asia (FNCA) dan geran penyelidikan ScienceFund Kementerian Sains, Teknologi dan Inovasi (MOSTI) pada 2017 dan 2019, Agensi Nuklear Malaysia berjaya mengkomersialkan tiga produk baja bionya.



www.mymicro.org

MSM UPCOMING EVENTS AND INITIATIVES 2021/2023

UPCOMING INITIATIVES

MMRIN

Malaysian Microbial Resources Information Network (MMRIN) is an exciting initiative to establish a mutual information sharing platform hosted by MSM website to showcase and promote Malaysian microbial diversity from Culture Collections (CCs). MSM's aspiration is for MMRIN to act as a national reference database for microbial information made easily accessible to the public, policy makers and stakeholders.

UPCOMING EVENTS

- MSMPS2022, Aug 22
- MSM2022, Dec 22
- MSM PechaKucha, Challenge 2022, TBA



This grant encourages the transfer of knowledge related to Microbiology to the community as well as to promote Microbiology to the public. Winner of the grant will each receive up to RM 5000 to conduct Microbiology related events that will benefit the community.

MSM Community Outreach Grant

STAY TUNED FOR MORE UPDATES!



MSM Membership and Expert Database

This initiative enables MSM members to share their scientific research information with other MSM members and the public, thereby promoting scientific and social networking. This database will also assist MSM in managing MSM membership.





TAKE ON THIS CHALLENGE!



Adapted from Microbiology Crossword Puzzle Competition, India



Thank you! MSM EXECUTIVE COMMITTEE 2019/2021

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Malaysian Society for Microbiology

e-**Bulletin**

Malaysian Society for Microbiology



Next edition's theme: Microbes and Community

Calling for newsletter articles!

- MSM Spotlight
- Article from MSM members
- Student's column
- News & reports
- Upcoming events
- Games

Interested in contributing an article or advertising a non-profit microbiology event in the next issue? Please reach out to us at:

• Email: msmcomm22@gmail.com