

## Issue 2

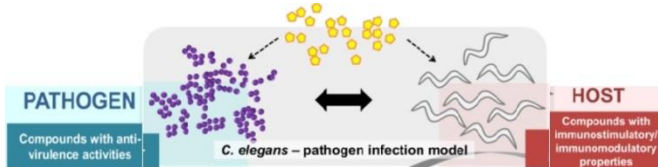
- Research Focus: Natural Products as Anti-Infectives towards Infectious Agents
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### Research Focus

## Natural Products as Anti-Infectives towards Infectious Agents

by Professor Dr. Sheila Nathan, National University of Malaysia

Antibiotics have had an enormous impact on global health by drastically reducing infection-associated mortality. Nevertheless, the progressive increase in antimicrobial resistance underscores the critical need for new anti-infectives discovery. Anti-infectives include antimicrobial agents, immunomodulators and anti-virulence agents. Many studies conducted in Malaysia are taking advantage of our natural product diversity to identify new anti-bacterials and anti-virals although inevitably, these natural product-derived agents will confer rapid selection of resistant sub-populations. Conversely, modulation of the innate and adaptive immunity is an attractive alternative to antimicrobials and immunomodulation by natural products is of key interest for anti-infective therapy. These host-targeting molecules confer no selective pressure on the host and can be developed as broad-spectrum therapeutics.



We utilized a *Caenorhabditis elegans*-*Staphylococcus aureus* screen to identify potential anti-infective agents from a collection of natural extracts and synthetic compounds<sup>1</sup>. The aqueous extract of Misai Kuching (*Orthosiphon stamineus*) leaves enhanced the survival of infected nematodes without interfering with bacterial growth. By capitalizing on the availability of transgenic reporter *C. elegans* strains and loss-of-function mutant worm strains, we dissected the host pathways targeted by *O. stamineus*, thus providing important clues on how the active ingredient modulates or enhances the host immune system to eradicate the pathogen. Taking the same approach to identify anti-infectives towards the tropical pathogen, *Burkholderia pseudomallei*, we utilized the *C. elegans*-*B. pseudomallei* infection model to screen natural products and we showed that curcumin attenuated bacterial virulence factors thus rescuing the worm from infection without affecting bacterial survival<sup>2</sup>. Thus, natural products readily available in Malaysia remain a potential untapped resource for anti-infectives that exhibit anti-virulence and immunomodulatory effects as potential therapeutic agents for infectious diseases.

<sup>1</sup>Kong, C., Tan, M.W., Nathan, S. (2014) *Orthosiphon stamineus* protects *Caenorhabditis elegans* against *Staphylococcus aureus* infection through immunomodulation. *Biol. Open* 3, 644–655.

<sup>2</sup>Eng, S.A. and Nathan, S. (2015) Curcumin rescues *Caenorhabditis elegans* from a *Burkholderia pseudomallei* infection. *Front. Microbiol.* 6:290.



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## ICBMBB 2018

MSBMB43 | MSMBB25

KUALA LUMPUR

The International Conference on Biochemistry, Molecular Biology and Biotechnology (ICBMBB2018), a joint conference between the 43<sup>rd</sup> Annual Conference of MSBMB and the 25<sup>th</sup> Scientific Meeting of the Malaysian Society for Molecular Biology and Biotechnology (MSMBB), was held on the 15<sup>th</sup>–16<sup>th</sup> August 2018 at the Four Points by Sheraton Puchong. This year's theme was “*Bridging Biosciences*”.

A total of 180 participants, comprising of postgraduate students, researchers and industry partners attended the event. The Conference featured 5 plenary talks by renowned scientists from Japan, Korea, Australia, Malaysia and United Kingdom, invited speakers, oral presentations, rapid oral and poster presentations. In addition to the annual YSN-ASM “Breakfast with the Experts” session, two new forums (Women in Science; Careers in Science) were introduced to facilitate an open discussion regarding advancements and issues pertaining to the science industry.



This year, 6 Young Investigator Awards (YIA), presented by the Young Scientist Network-Academy of Sciences Malaysia (YSN-ASM), were awarded. This competition is open to postgraduate students and postdoctoral fellows, aged <40 years old. They were required to present their original research work within 5-minutes. The joint winners are:

- 1<sup>st</sup> Place: Tan Ee Wern (UCSI); Sharan Malagobadan (UM)  
2<sup>nd</sup> Place: Fei- Kean Loh (UoN); Nur Athirah Yusof (UMS)  
3<sup>rd</sup> place: Bee Koon Gan (UPM); Annie Wai Y.C. (CRM)

In addition, 10 Best Poster Awards were also awarded at the Conference. The participants who received the highest scores and were recognised by the ICBMBB2018 Scientific Committee are Rakesh Naidu (Monash), Chear Chai Teng, (IMR), Thing Qiu Xian (UPM), Ashwinder Kaur (UoN), Yap Cheng Hong (UM), Indran Mathavan (ICL), Shahril Rozali (IUMW), Sasireigga Jaya Jothi (AIMST), Tan Boon Hooi (IMU) and Nazia Abdul Kadar (UMS).

## Malaysian Journal of Biochemistry and Molecular Biology (MJBMB)

SCOPUS-indexed

E-ISSN 2600-9005; [www.mjbmb.org](http://www.mjbmb.org)

Publishes online 3 times/year (April, August, December)

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**August–November 2018:** The journey to bring science out of its cocoon and into the hearts of young future-scientists continues as Assoc. Prof. Dr. Fung Shin Yee (UM), Prof. Dr. Ting Kang-Nee (UoN), and Dr. Fazril Razif (UM) held multiple outreach programmes for SJK(T) Bandar Sri Sendayan (Seremban), SJK(C) Union (Cyberjaya), Maplewood Academy (Puchong) and SJK(C) Puay Chai (Petaling Jaya). Students were introduced to the fundamentals of DNA and given hands-on experience in isolating DNA from a banana. Subsequently, they used microscopes to view various crystal structures and insects whilst learning how to calculate magnification scales. The students were also shown a video about volcanos and given a demonstration on making one via a chemical reaction.



We continue to uphold the goal of the programme, which is to spread our scientific knowledge to a wider community through talks, lab visits, in-school workshops and community presentations. MSBMB members who are interested to connect with the public are welcomed to join us and aid us in sharing our research and scientific issues with the community, and cultivate interest in science education. Assoc. Prof. Dr. Fung Shin Yee is MSBMB's Science Outreach Coordinator. She hopes that this programme will make science education accessible and interactive for students, teachers, and the community.

For more information, do get in touch with us!  
Contact [syfung@um.edu.my](mailto:syfung@um.edu.my)

### We want you to join us!

Membership in the Malaysian Society for Biochemistry and Molecular Biology is open to anyone who has an appropriate university degree or equivalent qualification in biochemistry, molecular biology or in a related discipline. The categories of membership in the Society are as follows:

No	Membership Type	Fee (Conditions)
1.	Ordinary Member	Joining RM10 (One time payment) Membership RM50 (effective Jan 1st 2016)
2.	Life Member	RM600 (One time payment) Ordinary Members in good standing for 5 years continuously and are at least 40 years of age

**Apply online now!**  
<http://msbmb.org/membership>



## DISTINGUISHED SCIENTISTS FROM ACROSS ASIA-PACIFIC TO CONVERGE IN MALAYSIA

**25 October 2018, KUALA LUMPUR:** Malaysia has won the bid to host the 27<sup>th</sup> Federation of Asian and Oceanian Biochemist and Molecular Biologist (FAOBMB) Conference, which will be held in conjunction with the 44<sup>th</sup> Annual Conference of the Malaysian Society for Biochemistry & Molecular Biology (MSBMB) on 19<sup>th</sup> – 22<sup>nd</sup> August 2019, at the Berjaya Times Square Hotel, Kuala Lumpur. The theme of FAOBMBKL2019 is '*Biomolecules: Networks & Systems*', with a special IUBMB symposia on '*Mosquito–Borne Illnesses*'.

This event will celebrate MSBMB's induction as an adhering body of the International Union of Biochemistry and Molecular Biology (IUBMB), providing avenues for Malaysian scientists to collaborate with international institutions with highly specialised expertise and technologies, further elevating the quality of Malaysian research. Over 4 days, 18 Symposia Sessions and 3 Forums (Women in Science, Education; Young Career Development) will be held to discuss issues related to academia and research within the Asia Pacific region.

The conference promises to highlight ground-breaking discoveries and translational research outcomes, which include presentations by winners of the internationally-acclaimed Tang Prize and Mahathir Science Award. Prof. Dr. Andrew Wang (President of IUBMB) emphasized IUBMB's commitment to balancing inequality in science education and technological advancements in Malaysia and the Asia-Pacific region. "Scientists play a key role in assisting governments and communities to help solve many problems plaguing the region." He added, "Discoveries involving Malaysia's vast natural resources and plant species can create many opportunities for rural communities."

"This Conference also provides a platform for local scientific corporations to showcase new technologies to the international community," said Prof. Dr. Sheila Nathan (Secretary General of FAOBMB). Prior to the Conference, 36 rising stars from six continents will be given the opportunity to share their outstanding research findings at Taylor's University Lakeside Campus as part of the Young Scientist Programme (YSP), to be held on 15–18 August 2019. Professor Emeritus Tan Sri Dr. Augustine Ong, President of the Malaysian Oil Scientists and Technologists (MOSTA) highlighted the importance of attracting young scientists to contribute new ideas to the field in order to solve scientific and medical-related issues. "Malaysia has continuously been at the forefront of tropical medicine research, with ground-breaking discoveries in combating dengue and Nipah virus infection. The country is always in need of bright, innovative talents."

Two other societies participating in FAOBMBKL2019 are the Organization for Women in Science for the Developing World, Malaysia Chapter (OWSD-MC) and the College of Pathologist, Academy of Medicine of Malaysia. This event is supported by the Malaysia Convention & Exhibition Bureau (MyCEB), a unit established by the Ministry of Tourism & Culture Malaysia (MOTAC), Academy of Sciences Malaysia (ASM), Veterinary Association Malaysia (VAM) and L'oreal (Malaysia). FAOBMBKL2019 is expected to attract more than 500 participants comprising of researchers, academics, students, industry professionals and government officials from the Asia-Pacific region.

**Participating Societies:**

**Supported by:**

