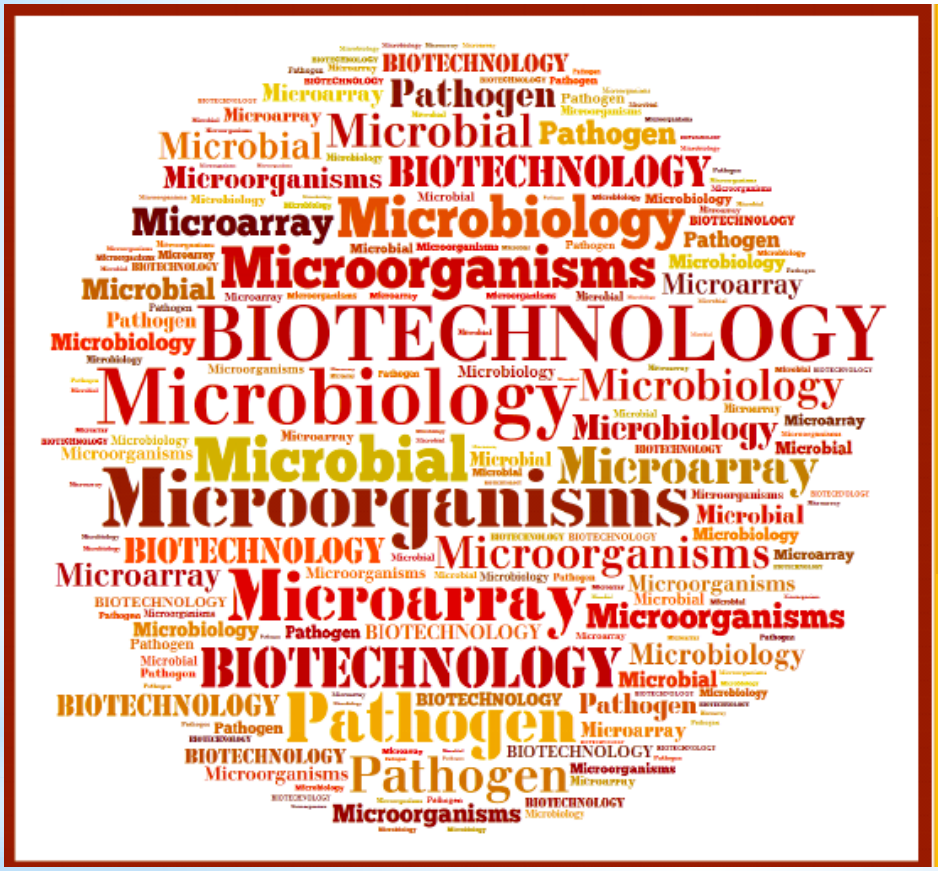
Singapore Society for Microbiology and Biotechnology
53rd Annual General Meeting



Date: 24 April 2026, 12.30 PM – 4.00 PM

Venue: NUS Department of Microbiology and Immunology, Block MD4A, 5 Science Drive 2, Level 2 Seminar Room, Singapore 117597

Registration link: https://forms.gle/vtdKHW1Tf1dw6Ka69

12.30 pm – Opening Address by Prof Justin Chu (SSMB President)

12.35 pm – Talk by Prof Stephen Pointing (NUS Dept. Biological Sciences & TMSI), Environmental Biotechnology - From Oil Spill Response to Oil Industry Applications

13.00 pm – Lunch + Lunchtime Talk by Ms Hithaishi B, Editor of BioSpectrum Asia

14.00 pm – Talk by Dr Yi-Hao Chan (A*STAR Infectious Diseases Labs), Genetics as a compass for life-threatening viral encephalitis

14.20 pm – Talk by Dr Jessica Ho (Duke-NUS Medical School), RNA-based Antiviral strategies against Influenza Viruses

14.40 pm – Talk by Dr Cheryl Lee (NUS Yong Loo Lin School of Medicine), The role of the electron transport chain in pathogen clearance

15.00 pm – SSMB AGM (for SSMB members only)

SSMB 53rd AGM :

ENVIRONMENTAL BIOTECHNOLOGY - FROM OIL SPILL RESPONSE TO OIL INDUSTRY APPLICATIONS

Prof Stephen Pointing
Department of Biological Sciences, National University of Singapore
Tropical Marine Science Institute, National University of Singapore
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Abstract:

The 2024 Marine Honour oil spill along Singapore's southern coast created a unique real-world test case for understanding how natural microbial communities respond to large-scale oil contamination, and how these responses can be harnessed for practical environmental biotechnology solutions. In this study, we combined field observations, laboratory experiments, and genome-based analyses to uncover how tropical marine microbes break down oil and contribute to environmental recovery. Within days of the spill, microbial communities shifted toward species capable of degrading hydrocarbons. These microbes carried genes for breaking down both simple (alkane) and complex (aromatic) oil components, detoxifying harmful compounds, and producing biosurfactants that enhance oil bioavailability. Controlled laboratory experiments demonstrated that microbes can degrade oil efficiently under both aerobic and anaerobic conditions, although degradation was up to fivefold faster in the presence of oxygen. Building on these insights, ongoing work is identifying the key enzymes and metabolic pathways responsible for oil breakdown, including those adapted to conditions encountered in maritime oil waste storage systems. By integrating this knowledge with metabolic modelling, we aim to pinpoint rate-limiting steps and optimise microbial consortia for enhanced performance. This research is now being translated into practical applications for the maritime sector. Specifically, we are developing microbial-based treatment strategies to accelerate the breakdown of oil waste generated by the bunker fuel industry, both onboard vessels and in controlled treatment systems. These environmental biotechnology approaches have the potential to transform how oil waste is managed.

Biography:

Professor Stephen Pointing is a leading environmental microbiologist at the National University of Singapore (NUS), where he serves as Professor in the Department of Biological Sciences and Principal Investigator in the Tropical Marine Science Institute (TMSI). His research within the NUS ecosystem focuses on how microbial communities respond to extreme environmental stress, spanning tropical marine ecosystems, hydrothermal systems, and atmospheric microbiomes. In his capacity as Director of TMSI, he leads strategic initiatives in marine conservation and environmental biotechnology, bridging fundamental discovery with applied solutions for pollutant bioremediation and climate change monitoring. A dedicated advocate for science communication, Professor Pointing also plays a key role in regional biodiversity and citizen-science initiatives.

SSMB 53rd AGM :

Genetics as a compass for life-threatening viral encephalitis

Dr Yi-Hao Chan
Principal investigator
A*STAR Infectious Diseases Labs

Abstract:
Most cases of viral encephalitis remain unexplained. Through genetic analysis approaches, efforts to search for monogenic variants in Herpes Simplex Encephalitis (HSE) or isolated SARS-CoV-2 encephalitis patient cohorts revealed deficiencies in TMEFF1 and DBR1, respectively, that can render patients susceptible to HSV-1 or SARS-CoV-2 infections in the brain. In this talk, I will demonstrate the underlying mechanisms of TMEFF1 and DBR1 as neuron-intrinsic antiviral factors in patient hPSC-derived neurons, and how inborn errors of TMEFF1 or DBR1 can underlie life-threatening viral encephalitis in patients with no prior severe infections.

Biography:
Dr Yi-Hao Chan completed his PhD with the A*STAR Graduate Scholarship on immune pathogenesis of alphaviruses. He was then awarded the A*STAR International Fellowship to pursue his postdoctoral training in Rockefeller University in New York, USA, under the tutelage of Dr Jean-Laurent Casanova, working on neuron-intrinsic antiviral factors that predispose patients to Herpes Simplex Encephalitis and isolated SARS-CoV-2 Encephalitis. He reported human TMEFF1 as the first discovered HSV-1 restriction factor in the brain in Nature. He also reported DBR1 deficiency as a genetic etiology of isolated SARS-CoV-2 encephalitis in Journal of Experimental Medicine. He co-authored multiple studies on inborn errors of immunity underlying MIS-C, MSMD and HSE, published in Science, Cell, and Science Immunology. He was awarded the RUCCTS pilot grant from the Shapiro-Silverberg Fund for the Advancement of Translational Research. As a principal investigator at A*STAR Infectious Diseases Labs, Yi-Hao is leading efforts to study genetic and immunological determinants of life-threatening viral diseases. He is also an Associate Editor for the Viral Immunology section at Frontiers in Immunology, a regional editor for the Journal of Human Immunity, and the recipient of the A*STAR Young Achiever award in 2023, the National Research Foundation Fellowship and the Singapore National Academy of Science (SNAS) Young Scientist Award in 2025.

SSMB 53rd AGM :

RNA-based Antiviral strategies against Influenza Viruses

Dr Jessica Ho Sook Yuin
Assistant Professor
Emerging Infectious Diseases program
Duke-NUS Medical School

Abstract:

Abstract: Influenza viruses pose a significant global health challenge, accounting for an estimated 3-5 million severe cases and 290-650K deaths annually worldwide. Although vaccines and antiviral drugs are available, the high mutation rates of these viruses, driven by recombination and reassortment, often lead to frequent resistance to current therapeutics/vaccines. Overall, this underscores an urgent need for novel antiviral strategies. In contrast to traditional small molecule approaches, our lab is interested in exploring how nucleic acid-based strategies, particularly those using antisense oligonucleotides, can be used as antivirals. Our rationale is that such approaches enable precise targeting of viral RNA and host-virus interactions, offering a complementary and potentially more adaptable strategy against rapidly evolving pathogens. In this talk, I will share two ongoing projects in the lab where we employ such strategies to inhibit influenza virus replication. Beyond Influenza, our findings have broader implications for other viral infections and diseases in which RNA-binding proteins play a critical role.

Biography:

Jessica is an Assistant Professor in the Emerging Infectious Diseases (EID) program at the Duke-NUS Medical School. She received her doctorate at the Rockefeller University and subsequently did her postdoctoral trainings at the Institute of Molecular and Cell Biology in A*STAR, Singapore and in the Department of Microbiology at the Icahn School of Medicine at Mount Sinai in New York City. Jess has had a long-standing interest in understanding how viruses change the host cell transcription and epigenetic machinery during infection. These changes directly impact viral biology but also impact how the host cell and host organism respond to other infections and/or environmental stressors in the short and long term. By understanding the molecular mechanisms underlying viral-induced changes in the host transcriptome and epigenome, she hopes to be able to identify suitable therapeutic strategies against viruses and viral-induced diseases.

SSMB 53rd AGM :

The role of the electron transport chain in pathogen clearance

Dr Cheryl Lee
Assistant Professor
Infectious Diseases Translational Research Programme
NUS Yong Loo Lin School of Medicine
National University of Singapore

Abstract:
Beyond just generating ATP, the electron transport chain (ETC) plays other roles like reactive oxidative species (ROS) and heat generation. Our lab found that the ETC undergoes changes during macrophage activation that aids in pathogen clearance. Some of these changes have been hijacked by viruses to evade macrophages, emphasizing the importance of studying these changes. As the ETC is a complex machinery with multiple functions, we seek to tease out how the cells utilize the ETC to achieve robust pathogen clearance without compromising energy production.

Biography:
Cheryl did her PhD on stem cells in Cambridge University. During her postdoc in Lena Ho's lab in Duke-NUS, she discovered a gene called MOCCI (pronounced as MOCHI) that inserts into the electron transport chain during macrophage activation. She has recently started her lab in NUS Translational Research Programme (ID-TRP), working on understanding the metabolic regulation of leukocyte activation during infection.