

# Singapore Society for Microbiology and Biotechnology 48<sup>th</sup> Annual General Meeting



Date: 23 April 2021, 9.00-11.00am

Mode: Virtual Zoom meeting (Link will be provided upon registration at <https://forms.gle/wfbFfXQANUKm1X1m8>)

Programme:

9.00am - Talk by Dr Jason Kircos, Neogen Corporation USA  
Soleris NG (Next Generation): Microbiology at the speed of light

10.00am - Talk by A/Prof Lee Yuan Kun, Department of Microbiology & Immunology/ Surgery, Yong Loo Lin School of Medicine, NUS. How could I groom a gut microbiome for health and wellness?

10.30pm - SSMB 48th Annual General Meeting

SSMB 48<sup>th</sup> AGM Invited Talk:



## How could I groom a gut microbiome for health and wellness?

A/Prof Lee Yuan Kun, Department of Microbiology & Immunology/ Department of Surgery, Yong Loo Lin School of Medicine, National University of Singapore

### Abstract

Interactions between gut microbes and the human host are expected because of their lifelong association and proximity. Indeed, gut microbiome has been reported to play vital roles in the physiological functions and wellbeing of people. *Bifidobacterium* and *Bacteroides* have been aligned with the maturation of host immunity in earlier life, correction of GI disorders associated with colitis, as well as behavioural and physiological abnormalities associated with neurodevelopment disorders. *Prevotella* was reported positively interfered in energy homeostasis and glucose control. The first wave of gut microbes arrives mostly through vertical transmission from mother to child. Upon introduction of solid foods, dietary habit has been demonstrated the major determining factor in gut microbiome composition, in studies comparing microbiome of people across geographical regions and of different ethnicities. Overall, the high meat protein and fat, high sugar, non-resistant starch Western and Eastern Asian diets are associated with *Bacteroides-Bifidobacterium* dominated gut microbiome. Whereas the plant-rich, fibers and carbohydrates (high in resistant starch) rich diet of Southeast Asian and African type favours *Prevotella* in the gut microbiome. These associations may be due to provision of metabolizable nutrients and resulting microenvironment. Establishment of the respective stable microbiome compositions facilitates colonisation resistance, in protecting the gut from being colonized by undesirable enteric pathogens arriving with foods.

Clinically, however both *Bacteroides* and *Prevotella* are implicated in human diseases. *Bacteroides* is listed as an independent high-risk factor for many common diseases in developed countries. These include arterial diseases, type-2 diabetes, colorectal cancer, cardiomyopathy, rheumatoid arthritis, inflammatory bowel disease, Parkinson's disease, celiac disease and Alzheimer disease. On the other hand, the succinate producing *Prevotella* is also implicated directly or indirectly in the causation of many chronic inflammatory diseases. These include periodontitis, bacterial vaginosis, rheumatoid arthritis, metabolic disorders, tonsillitis, advanced fibrosis non-alcoholic fatty liver disease (NAFLD), cardiometabolic risk and asthma. These studies thus bring about a critical question, is there a healthy microbiome profile?

Singapore is a multi-ethnic global city, where foods around the world are readily available. Here, people consume foods of different origins in random rotation. It was observed that Singaporeans having multi-ethnic dietary habit showed a more even distribution of major microbiota types and also colonisation resistance. Could Singapore microbiome the healthier microbiome structure? The relatively high economical standing and excellent medical care may explain Singaporean among the world's long-life expectancies at birth. Could the diverse microbiome without predominant disease-inducing microbiota contributes to Singaporeans having the status of the longest Healthy Life Expectancy (HALE) at birth?