



5TH MICROBIOME R&D & BUSINESS COLLABORATION CONGRESS 4TH PROBIOTICS CONGRESS: ASIA

REGENT TAIPEI, TAIWAN
— 6 - 7 March 2019 —



Co-Hosts



國立中央大學
National Central University



國立交通大學
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Japanese Society for
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Global Engage is pleased to announce, as part of their worldwide microbiome series, the **5th Microbiome R&D and Business Collaboration Congress** and co-located **4th Probiotics Congress** which will be held on March 6-7, 2019 at the Regent Taipei, Taiwan. Co-hosted with the National Central University and National Chiao Tung University (GLORIA) of Taiwan, the congresses will bring together industry and academic delegates to discuss the latest microbiome research, the development of partnerships and commercial collaborations in this area and the expected growth of product pipelines.

Recent microbiome research has demonstrated the important role that communities of microorganisms play on human body. This area of research, associated with immunity and behavioural traits, is paramount in maintaining our health and keeping us away from disease. With numerous pre-clinical and clinical studies being conducted, microbiome is transitioning from a descriptive to a more mechanistic science. It is inevitable that microbiome is a promising prospect to improve human health, as it enables us to step forward and manipulate microbiota in a variety of ways. With the growing interest in the area, research experts and industry players are working together towards bringing microbiome discoveries to the market, making it an unprecedented investment opportunity alongside large-scale collaborations underway and sequencing data placed in the public domain. Due to this reason, microbiome is now set to make waves in the science and medical world as an essential prerequisite for future rational interventions.

Attracting over 300 delegates, the co-located meetings will promote comprehensive understanding and reciprocal benefits of the latest scientific and business developments in microbiome and probiotics. The 2-day interactive meeting will highlight cutting edge research and business case studies through expert presentations, and panel discussions exploring key issues in the subject area, an exhibition filled with solution providers showcasing their products and solutions, as well as networking breaks to promote interactions and business reach with fellow peers.

Having a diverged group of professionals interested in microbiome and probiotics, both scientific and industry talks will take place at this event. Topic areas to be addressed include microbiome in health and disease, skin microbiome, probiotics and brain health amongst others as well as the regulatory issues associated with these areas of research. It is hoped that the meetings will further develop the microbiome and probiotics research, as well as foster more collaborations and commercialisation of the areas in Asia.



JACK GILBERT

Faculty Director, The Microbiome Center and Professor, Department of Surgery, University of Chicago, USA | Founder, The Earth Microbiome Project and Co-Founder, American Gut Project



FELICE N JACKA

Professor and Director, Food and Mood Centre, IMPACT SRC, Deakin University, Australia and President, International Society for Nutritional Psychiatry Research



JACQUES RAVEL

Professor, Microbiology and Immunology and Associate Director for Genomics, Institute for Genome Sciences, University of Maryland School of Medicine, USA



MARGARET MORRIS

Professor and Head of Pharmacology, University of New South Wales, Australia



JOHAN VAN HYLCKAMA Vlieg

Vice President Microbiome & Human Health Innovation, Chr. Hanssen A/S, Germany



YASUHIRO KOGA

President, Japanese Society for Probiotic Science



MING-JU CHEN

Professor, Department of Animal Science and Technology, National Taiwan University, Taiwan and President, Taiwan Association of Lactic Acid Bacteria



GREGORY LAMBERT

CEO, TargEDys, Netherlands

MICROBIOME DISCOVERIES

- Latest updates on the microbiome movement in Asia and across the globe
- Tools and techniques for studying microbiome
 - Metagenomics
 - Sequencing method / bioinformatics

MICROBIOME IN HEALTH AND DISEASE

- Relationship between obesity and metabolic disease
- Inflammation
- Gut-brain axis
- Enteric infection/microbiome pathogen interactions
- Case studies such as IBD, diabetes, obesity, colitis
- Antibiotics resistance
- Infant gut microbiome

MICROBIOME-BASED THERAPIES

- Drug delivery
- Faecal microbiome transplant
- Biomarker / Clinical Development

OUTSIDE THE GUT

- Skin microbiome
 - Strategies and tools for studying skin microbiome
 - Case studies on acne, eczema, atopic dermatitis, wound health & cosmetic applications
- Women's health
 - Host-interactions, vaginal microbiome, preterm birth and pregnancy progression
- Gut-brain axis
- Oral and respiratory microbiome research

COMMERCIALISATION OF MICROBIOME AND PROBIOTICS

- Developing business relationships between academia & pharma
- Collaborations/partnerships – the global scope of microbiome research/structuring successful collaborations
- Bringing live microbial products to market – IP, regulation, GMP
- Pharmaceutical involvement and therapeutic development
- Probiotic strain identification, designation and safety

PROBIOTICS R&D

- Strain discovery
- Gut-pathogen interactions
- Role of probiotics in IBS management
- Antibiotic exposure & multidrug resistance
- Role of probiotics as anti-diarrhoeal agents
- Efficacy and effectiveness of different strains
- Biocontrol of gut pathogens with probiotics
- Probiotics and the gut-brain axis
- Probiotics and skin
- Probiotics and allergy / disease
- Food and fermentation

PAEDIATRICS

- Milk-oriented microbiota
- Atopic eczema
- Probiotic and trial safety in infant populations
- A role for probiotics in malnutrition and the developing world

WOMEN'S HEALTH

- Reducing the recurrence of urogenital infections in women
- Probiotics in bacterial vaginosis
- Vaginal microbiome

REGULATION AND PRODUCT DEVELOPMENT

- Examining the probiotic market in the Asia-Pacific region
- Safety and QC
- Strain identification, designation and safety
- IP, regulation and GMP perspective
- Clinical trials and health claim substantiation

CONFIRMED SPEAKERS



JACK GILBERT

Faculty Director, The Microbiome Center and Professor, Department of Surgery, University of Chicago, USA | Founder, The Earth Microbiome Project and Co-Founder, American Gut Project



MARK MORRISON

Chair and Professor, Microbial Biology and Metagenomics, University of Queensland Diamantina Institute, Australia



NICOLE ROY

Principal Scientist and Science Team Leader, AgResearch, New Zealand



BAOLI XU

Principal investigator and Director of Microbial Genome Research Center, The Institute of Microbiology and Chinese Academy of Sciences, China



CÉCILE CLAUD

Project Leader, Research and Innovation Skin Microbiome Unit, L'Oreal, France



YUNN HWEN GAN

Associate Professor, National University of Singapore, Singapore



JQ LIU

Principal Scientist, Procter & Gamble, Singapore



TZEHOU LAM

Senior Scientist, Procter & Gamble, Singapore



CHRISTOPHE LAY

Senior Scientist, Gut Microbiota, Danone Nutricia Research, Singapore



MARGARET MORRIS

Professor and Head of Pharmacology, University of New South Wales, Australia



LARRY WEISS

CEO and Founder, Persona Biome



YI-BING LIN

Vice Chancellor, University System of Taiwan, National Chiao-Tung University, Taiwan



JACQUES RAVEL

Professor, Microbiology and Immunology and Associate Director for Genomics, Institute for Genome Sciences, University of Maryland School of Medicine, USA



FELICE N JACKA

Professor and Director, Food and Mood Centre, IMPACT SRC, Deakin University, Australia and President, International Society for Nutritional Psychiatry Research



HAZEL MITCHELL

Professor, University of New South Wales, Australia



YUN-GI KIM

Associate Professor, Division of Biochemistry, Faculty of Pharmacy, Keio University, Japan



SHAHRLU RAZID SARBINI

Dean, Faculty of Agricultural and Food Sciences, Universiti Putra Malaysia



NIRANJANA NAGARAJAN

Senior Group Leader, Genome Institute of Singapore, Singapore



KARL FRASER

Senior Scientist, AgResearch, New Zealand



WAYNE YOUNG

Senior Scientist, AgResearch, New Zealand



HOK BING THIO

Head Residency program & Vice Chair, Department of Dermatology, Erasmus University Medical Center, Netherlands



JAMES CHU

CEO of GLORIA, National Central University, Taiwan



JOHN COMMON

Principal Investigator, Skin Research Institute of Singapore (SRIS), Singapore



YOSHIHISA YAMASHITA

Professor and Chairperson, Section of Preventive and Public Health Dentistry, Division of Oral Health, Growth and Development, Kyushu University Faculty of Dental Science, Japan



DEV MITTAR

Lead Scientist and Head of R&D ATCC, USA



CHUN-MING ERIC HUANG

Chair Professor, Department of Biomedical Sciences and Engineering, National Central University, Taiwan



ELIANA MARINO MORENO

Principal Research Fellow and Immunology and Diabetes Laboratory Head, School of Biomedical Sciences, Monash University, Australia

CONFIRMED SPEAKERS



ANDERS HENDRIKSSON

Principal Application Specialist,
DuPont Nutrition & Health,
Australia



NAGENDRA SHAH

Professor, Functional Food, Hong
Kong University, Hong Kong



JOHAN VAN HYLCKAMA VLIEG

Vice President Microbiome &
Human Health Innovation, Chr.
Hanssen A/S, Germany



MING-JU CHEN

Professor, Department of Animal
Science and Technology, National
Taiwan University, Taiwan



YING-CHIEH TSAI

Professor, Institute of Biochemistry
and Molecular Biology, National
Yang-Ming University, Taiwan



HANNA SIDJABAT

Honorary Fellow and Chief
Investigator, University of
Queensland Centre for Clinical
Research, Australia



GWANG PYOKO

Professor, School of Biological
Sciences, Seoul National
University, Korea



YASUHIRO KOGA

President, Japanese Society for
Probiotic Science



JIN-ZHONG XIAO

General Manager, Next Generation
Sequencing Institute, Morinaga
Milk, Japan



GREGORY LAMBERT

CEO, TargEDys, Netherlands



PATRICIA CONWAY

Visiting Professor, Nanyang
Technology University (NTU),
Singapore



REBECCA SLYKERMAN

Clinical Neuropsychologist and
Senior Research Fellow, University
of Auckland, New Zealand



TOH MINGZHAN

Research Fellow, Food Science
& Technology Programme,
Department of Chemistry, National
University of Singapore



LEE YEONG YEH

Professor of Medicine &
Consultant of Gastroenterology,
Hepatology & Internal Medicine,
Universiti Sains Malaysia



08:00-08:50

Registration & Refreshments

MICROBIOME

08:55-09:00

Global Engage Welcome Address and Morning Chair's Opening Remarks: **Yun-Gi Kim**, Associate Professor, Division of Biochemistry, Faculty of Pharmacy, Keio University, Japan



KEYNOTE PRESENTATION:
JACK GILBERT

Faculty Director, The Microbiome Center and Professor, Department of Surgery, University of Chicago, USA/ Founder, The Earth Microbiome Project and Co-Founder, American Gut Project

Invisible Influence: The Microbiome and Human Health

The human microbiome is quickly being recognized as a dynamic part of the human ecosystem, and research is starting to demonstrate that using ecology to understand this ecosystem has profound benefits for patient wellness. The immune system controls our interaction with the microbial world, and yet the microbial communities in our bodies are central to modulating the immune response. Changes in the human microbiome have substantial influence on atopy, neurological disorders, metabolic disorders, and a range of complex conditions and disease states. We will discuss evidence of these mechanisms of interaction and how we have started to disturb the delicate balance of the immune-microbe equilibrium, impacting the development and function of our immune systems. Central to this disturbance is the distance we have placed between our children and the microbial world, which has been demonstrated to have a substantial influence on their physiological, immunological, neurological and even endocrinological development. Applying new strategies to identify how the microbial ecosystem correlates with diseases states and treatment efficacy through Microbiome-Wide Association Studies (MWAS) is altering the trajectory of precision medicine, and providing a new framework for facilitating patient care.

09:00-09:35



CHUN-MING ERIC HUANG

Chair Professor, Department of Biomedical Sciences and Engineering, National Central University, Taiwan

Microbiome Banking and Editing with Electro-biotics

A commercial stool bank by collecting human gut microbiota is available in the market. Efforts from our group are devoted to establish a "Skin Microbiome Bank" for development of novel skin probiotics and/or prebiotics. The microbes within a human microenvironment may compete with each other for the same carbon source of fermentation. Microbiome editing by targeting individual bacterial species in the microbiome using bacteria-specific carbon source is our strategy to restore a health-associated microbiome after dysbiosis. The conjugates of carbohydrates and polymers provide unique carbon sources (prebiotics) for specific skin probiotic bacteria. Our recent results have demonstrated that skin bacteria can yield electricity during the bacterial fermentation. By using electrogenic bacteria, we develop new technology derived from the concept of probiotic-prebiotic-postbiotic-"electrobiotic". Next-generation sequencing (NGS), although it is a new approach to biomarker identification, may not be able to dynamically detect the dysbiotic microbiome. We here introduce the technology of "electrobiotic" for profiling and monitoring the skin dysbiosis in real time.

09:35-10:05

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10:05-10:35

PROBIOTICS

08:55-09:00

Global Engage Welcome Address and Morning Chair's Opening Remarks: **Rebecca Slykerman**, Clinical Neuropsychologist and Senior Research Fellow, University of Auckland, New Zealand

KEYNOTE PRESENTATION:
LIPING ZHAO (Reserved)

Eveleigh-Fenton Chair of Applied Microbiology, Department of Biochemistry and Microbiology, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey, USA

Title TBC

09:00-09:35



JOHAN VAN HYLCKAMA VLIEG

Vice President, Microbiome & Human Health Innovation, Chr. Hansen A/S, Germany

Microbes matter more than ever - Innovation in probiotics in the microbiome era

09:35-10:05

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10:05-10:35

10 MINUTE OPENING FROM THE TAIWANESE MINISTRY:

Title TBC

10:35-10:45

10:45-11:50

Morning Refreshments / Odd-Numbered Poster Presentations / One-to-One Meetings

MICROBIOME IN HEALTH & DISEASES

Chair: Yun-Gi Kim, Associate Professor, Division of Biochemistry, Faculty of Pharmacy, Keio University, Japan



MARK MORRISON

Chair and Professor, Microbial Biology and Metagenomics, University of Queensland

Diamantina Institute, Australia

Title TBC

11:50-12:15

MICROBIOME R&D

Chair: Hok Bing Thio, Head Residency program & Vice Chair, Department of Dermatology, Erasmus University Medical Center, Netherlands



NICOLE ROY

Principal Scientist and Science Team Leader, AgResearch, New Zealand

The COMFORT

cohort: Identifying biomarkers for gut-brain axis relevant to functional gut disorders

The links between food, gut function and comfort, and brain function are at the forefront of nutritional research. Irritable Bowel Syndrome (IBS) is a functional gut disorder characterised by chronic or recurrent abdominal discomfort mostly associated with changes in gut habit in the absence of a detectable organic cause. Several central and peripheral mechanisms initiate perturbations in gut motor and sensory functions and lead to IBS symptoms. Peripheral molecules, and associated pathway dysfunctions and altered tissue metabolism, are important to better define functional gut disorders. In a case-control study, individuals with functional gut symptoms (cases) or asymptomatic (controls) undergoing colonoscopy were recruited. Demographics, symptoms score, psychological score and dietary records were recorded. Metabolomics of biological samples, shotgun metagenomics sequencing of faecal samples and quantification of plasma neurotransmitters and bacterial metabolites were carried out to identify microbial and host factors and gain mechanistic insights into functional gut disorders.

11:50-12:15

R&D - FOOD

Chair: Rebecca Slykerman, Clinical Neuropsychologist and Senior Research Fellow, University of Auckland, New Zealand



NAGENDRA SHAH

Professor, Functional Food, Hong Kong University, Hong Kong

Challenges of

synthesizing gamma-aminobutyric acid (GABA) in milk by a novel strain of *Lactobacillus brevis* NPS-QW-145 isolated from Korean kimchi

In this study, several GABA-producing LAB isolates have been isolated from naturally fermented foods such as Korean kimchi. Previous screening methods are time-consuming and inefficient. In the present study, we have developed a novel screening and identification method for GABA-producing LAB from Korean kimchi. Acid treatment was applied to screening procedure to obtain acid-tolerant LAB isolates, and then a simple identification of GABA-producing LAB based on release of gas by these bacteria has been developed. The amount of GABA produced by LAB isolates at various monosodium glutamate (MSG) concentrations and incubation time in MRS medium was quantified by HPLC. Genetic identification of high GABA-producing LAB was carried out by both 16S rRNA gene and glutamate decarboxylase gene. Nine potential GABA-producing LAB isolates were selected by observing gas release during fermentation. The conversion ability of MSG into GABA for all nine LAB isolates was 100% (supplementation level 10 g/L MSG, incubation time 24 h), over 80% (supplementation level 30 g/L MSG, incubation 48 h), over 60% (supplementation level 50 g/L MSG, incubation time 72 h) and over 50% (supplementation level 70 g/L MSG, incubation time 72 h). These nine LAB isolates were genetically identified as *Lactobacillus brevis* by 16S rRNA gene and confirmed by glutamate decarboxylase gene.

11:50-12:15

YI-BING LIN

Vice Chancellor, University System of Taiwan, National Chiao Tung University, Taiwan

Application of Artificial

Intelligence to Earth Microbiome



12:15-12:40

HAZEL MITCHELL

Professor, University of New South Wales, Australia

Title TBC



12:15-12:40

ANDERS HENDRIKSSON

Principal Application Specialist, DuPont Nutrition & Health, Australia



12:15-12:40

Dietary tools for shaping the gut microbiome

There is a substantial pool of data

12:15-12:40

Continued

12:40-13:10

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12:15-12:40

Continued

12:40-13:10

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12:15-12:40

demonstrating effects of a range of dietary components on composition of the gut microbiome. This presentation will elaborate on:

- The effects of different dietary proteins on the composition of gut microbiota, as well as reported health benefits of the such proteins.
- The role of human milk oligosaccharides in establishing an optimal microbiota early on in life, and
- Probiotics, which may deliver significant benefits even in the presence of a well-established gut microbiome.

12:40-13:10

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13:10-14:10

Luncheon / Poster Presentations / One-to-One Meetings

MICROBIOME IN HEALTH & DISEASES

14:10-14:35

**BAOLI XU**

Principal investigator and Director of Microbial Genome Research Center, The Institute of Microbiology and Chinese Academy of Sciences, China
Title TBC

**YUNN HWEN GAN**

Associate Professor, National University of Singapore, Singapore
Factors affecting gut colonization

and pathogenesis of hypervirulent *Klebsiella pneumoniae*, the causative agent of liver abscess disease

Hypervirulent *Klebsiella pneumoniae* is an emerging cause of community-acquired pyogenic liver abscess in parts of Asia such as South Korea, Singapore, Taiwan and Hong Kong. Hypervirulent isolates are generally hypermucoviscous with the possession of a large virulent plasmid encoding rmpA and iron siderophores such as aerobactin. In Singapore and many parts of the world, K1 and K2 capsular types are the predominant hypervirulent isolates. In *Klebsiella* induced liver abscess (KLA), colonization by the bacteria is believed to precede translocation from the intestines to the liver. However, factors which predispose and facilitate the colonisation in the gut are not clearly defined. In our oral infection mouse model with a K1 capsular type, hypervirulent *K. pneumoniae*, we examine the role of probiotics administration after antibiotics treatment, as well as the role of capsule and fucose usage for efficient gut colonization. I shall discuss our results on each of these aspects as well as other factors that could contribute to the ability of the bacteria to establish an intestinal niche.

14:35-15:00

SKIN MICROBIOME

14:10-14:35

**NIRANJAN NAGARAJAN**

Senior Group Leader and Associate Director, Genome Institute of Singapore, A*STAR, Singapore

Skin Microbiome and Eczema**CÉCILE CLAUD**

Project Leader, Research and Innovation Skin Microbiome Unit, L'Oreal, France
Title TBC

14:35-15:00

Skin microbiome has positive impact on several aspects of human health, such as innate immune response modulation and protection against pathogens. Microorganisms interact with host keratinocytes and innate immune system, stimulating the secretion of antimicrobial peptides, free fatty acids, cytokines and chemokines, which might lead to adaptive immune responses. The skin microbiota contribute also to reinforce the skin barrier function (tight junctions), elicitation of antimicrobial peptides and repair. Thus it is essential to understand how its disequilibrium contributes to skin conditions as for example scalp condition. Dandruff is one of the most common scalp conditions, affecting approximately half of adult population worldwide. This inflammatory chronic disorder is related to skin barrier disruption, epidermal cellular proliferation and differentiation, as well as shifts in sebum composition. It has been frequently associated with yeasts from *Malassezia* genus, which are also members of the healthy cutaneous microbiome. However, the microbial role has not been elucidated yet, and the etiology of the disorder remains incompletely understood. We used sanger and next-generation sequencing (NGS)

R&D - FOOD & DISEASES

14:10-14:35

**PATRICIA CONWAY**

Visiting Professor, Nanyang Technology University (NTU), Singapore

Title TBC**YING-CHIEH TSAI**

Professor, Institute of Biochemistry and Molecular Biology, National Yang-Ming University, Taiwan

Microbiota-Gut-Brain Axis, Psychobiotics and Neuropsychiatric Disorders

Psychobiotics, a class of probiotics with psychotropic activities via the gut-brain axis. *Lactobacillus plantarum* PS128 is a novel psychobiotic, which normalized depression-like behaviors in early life-stressed mice and improved locomotion in Parkinson's disease-like mice. In a 4-week, randomized, double-blind, placebo-controlled study investigated the effects of PS128 with autism spectrum disorder (n = 72), PS128 appeared to reduce scores for hyperactivity/impulsivity, opposition/ defiance, anxiety, problems related to thoughts, and rule-breaking behaviors etc., whereas the placebo exerted insignificant effects. These results showed that PS128 is a feasible and natural intervention for alleviating symptoms of neuropsychiatric disorders.

14:35-15:00

14:35-15:00

**CHRISTOPHE LAY**

Senior Scientist, Gut Microbiota, Danone Nutricia Research, Singapore

Early life nutrition and its relevance in the first 1,000 days: A lifelong microbial journey perspective

The human gut microbiome is transmitted from one generation to the next. This transgenerational microbial inheritance occurs during pregnancy, during birth and during breastfeeding. Such vertical transmission contributes to educate our immature immune, metabolic and neurocognitive systems during foetal and early life, highlighting therefore the role of the microbiome in health and diseases. The first 1000 days of life is recognized as an important window to nurture child health and development, and increasing body of evidence indicate that a compromised microbiome is a risk factor for the development of non-communicable diseases. Nutritional intervention could be harnessed as a mean to reduce the disease risk associated with a compromised microbiome

15:00-15:25

14:35-15:00

**JQ LIU**

Principal Scientist, Procter & Gamble, Singapore

**TZEHOU LAM**

Scientist, Procter & Gamble, Singapore

Metagenomics as a key tool for understanding the microbial basis of body odor in teenagers and kids

15:00-15:25

Even though human sweat is odorless, bacterial growth and decomposition of specific odor precursors in it is believed to give rise to body odor in humans. While mechanisms of odor generation have been widely studied in adults, little is known for teenagers and kids who have distinct sweat composition from immature apocrine and sebaceous glands, but are arguably more susceptible to the social and psychological impact of malodor. We integrated information from whole-microbiome analysis of multiple skin and multiple time points to perform the largest metagenome-wide association study to date on malodor. Correlations between odor intensity and the relative abundance of specific bacteria and the associated metabolic pathway will be presented. The results showcase the power of skin metagenomics to study host-microbial co-metabolic interactions, identifying distinct pathways for odor generation from sweat in kids and teenagers, and highlighting key enzymatic targets for intervention.

14:35-15:00

**GWANG PYOKO**

Professor, School of Biological Sciences, Seoul National University, Korea
Title TBC

15:00-15:25

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15:25-15:40

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15:25-15:40

15:40-16:40

Afternoon Refreshments / Even-Numbered Poster Presentations / One-to-One Meetings

**YUNGI KIM**

Associate Professor, Division of Biochemistry, Faculty of Pharmacy, Keio University, Japan
Title TBC

16:40-17:05

**JOHN COMMON**

Institute of Molecular Biology, A*STAR, Singapore

16:40-17:05

Skin microbiome signatures in health and disease correlate with host immunity and microbial virulence
The skin is a challenging ecosystem

**SENIOR REPRESENTATIVE**

Gloria
Title TBC

16:40-17:05

16:40-17:05

Continued

ROUNDTABLE DISCUSSIONS:**Table 1: Gut-brain axis****Table 2: Metagenomic data analysis****Table 3: Therapeutics****Table 4: Investment & VC****Table 5: Academic-industry collaboration**

17:05-17:35

16:40-17:05

to study meta-omics due to the low amount of biomass that can be recovered, which limits downstream techniques that are currently feasible on human subjects. We have recently been using metagenomics to investigate microbial communities present on the skin of atopic dermatitis patients to better understand shifts in community diversity and microbial functional characteristics. We can identify skin microbiome dermatotypes that stratify groups of AD patients and observed that these groups correlate with host immunity and microbial virulence.

**HOK BING THIO**

Head Residency program & Vice Chair, Department of Dermatology, Erasmus University Medical Center, Netherlands

Microbiome, Immune System and Psoriasis

Psoriasis is a chronic immune-mediated inflammatory skin disease that affects about 2% of the world's population. It arises in genetically predisposed individuals. Both the skin and the gut microbiome influence the development and function of immune system. Studies on the cutaneous microbiome show a trend toward an increased relative abundance of Streptococcus and a decreased level of Propionibacterium in patients with psoriasis compared to healthy controls. In the gut microbiome, the ratio of Faecalibacterium prausnitzii and Escherichia Coli (F:E index) was perturbed in psoriatic individuals compared to healthy controls. Modulating the gut and skin microbiota can be beneficial in psoriasis.

17:05-17:35

16:40-17:05

Continued

ROUNDTABLE DISCUSSIONS:**Table 1: Probiotics and diseases****Table 2: Strain identification****Table 3: Business development & regulatory approach****Table 4: Product formulation and delivery****Table 5: Academic-industry collaboration**

17:05-17:35

17:35

End of Day 1 / Networking Drinks Reception

08:30-08:55

Refreshments

MICROBIOME

08:55-09:00

Morning Chair's Opening Remarks

09:00-09:30

Reserved

**FELICE N JACKA**

Professor and Director, Food and Mood Centre, IMPACT SRC, Deakin University, Australia and President, International Society for Nutritional Psychiatry Research

The therapeutic potential of diet and the gut microbiota in brain and behaviour

With mental disorders the leading source of disability globally, the identification of new targets for prevention and management is imperative. A rapidly emerging field of research suggests that the microbiome-gut-brain axis is of substantial relevance to mood and behaviour. Similarly, unhealthy diet has recently emerged as a significant correlate of and risk factor for depression. This presentation will address the evidence for the gut microbiota as a key factor mediating the link between diet and mental illnesses and focuses on the potential of gut-focused interventions for the prevention and treatment of such disorders. The development of new technologies is affording a better understanding of how diet influences gut microbiota composition and activity and how this may, in turn, influence mental illness. New evidence is also pointing to the utility of diet in influencing mental health. Although in its early stages, the emerging field of research focused on the human microbiome suggests an important role for the gut microbiota in influencing brain development, behaviour and mood in humans. The recognition that the gut microbiota interacts bi-directionally with other environmental risk factors, particularly diet, suggests promise in the development of interventions targeting the gut microbiota for the prevention and treatment of mental health disorders.

09:30-10:00

10:00-10:30

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PROBIOTICS

08:55-09:00

Morning Chair's Opening Remarks: Lee Yeong Yeh, Professor of Medicine & Consultant of Gastroenterology, Hepatology & Internal Medicine, Universiti Sains Malaysia

**YASUHIRO KOGA**

President, Japanese Society for Probiotic Science

Prevention of periodontal diseases by an oral probiotic strain, Lactobacillus salivarius TI2711 (LS1)

The susceptibility of the host, the presence of pathogenic bacteria and the absence of "beneficial bacteria" are the main etiological factors of periodontal diseases. We have isolated Lactobacillus salivarius TI2711 (LS1) as an oral probiotic strain. Porphyromonas gingivalis is considered a major pathogenic bacterium causing periodontal diseases. LS1 completely killed P. gingivalis in a co-culture system at an input ratio of one to one-million. In a clinical study where subjects were daily administered 2x10⁹ CFU LS1 for 4 weeks, the number of P. gingivalis in the subgingival plaque decreased to about one-tenth after 4-week-treatment.

09:00-09:30

**JIN-ZHONG XIAO**

Director, Next Generation Sequencing Institute, Morinaga Milk, Japan

Insight into the reason of being of Bifidobacterium in human gut

Bifidobacterium is one of the major members of the human intestinal microbiota which comprises thousands of bacterial species. The genus Bifidobacterium has been known to contain > 60 species/subspecies. Some of these bifidobacteria species are typical inhabitants of the human gut (designated as human-residential bifidobacteria, HRB) whereas others naturally colonise the guts of other animals (designated as non-HRB). This presentation will make some insight into the reason of being (how and why) of Bifidobacterium inhabiting the human gut, based on our new findings from genotypic and physiological studies.

09:30-10:00

10:00-10:30

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10:30-11:35

Morning Refreshments / Poster Presentations / One-to-One Meetings

11:35-12:10

PANEL DISCUSSIONS:

A Step to Commercialisation: Building a Microbiome Network between Academics and Industry for Microbiome Discovery Efforts

**JACK GILBERT**

Faculty Director, The Microbiome Center and Professor, Department of Surgery, University of Chicago, USA / Founder, The Earth Microbiome Project and Co-Founder, American Gut Project

11:35-12:10

PANEL DISCUSSIONS:

Towards Preventive Measures: Exploring the Current Market Trends and Regulatory Approach on Probiotics Use in Asia

MICROBIOME

**MARGARET MORRIS**

Professor and Head of Pharmacology,
University of New South Wales, Australia

Dietary modulation of the gut microbiome and behaviour – can we intervene?

Our work has demonstrated that rats fed an obesogenic, cafeteria style diet consistently show deficits in hippocampal dependent memory tasks, and reduced diversity of their gut microbiome compared to control rats. Such behavioural deficits were independent of weight differences, as rats consuming diets high in saturated fat or high in sugar, for just two weeks, had impaired spatial memory even while consuming similar amounts of energy as control rats on a regular diet. We found that the memory deficits were associated with changes in the gut microbiota composition and genes related to inflammation in the hippocampus, which is a key brain region for memory and learning. More recently we have investigated whether the bacteriostatic antibiotic, minocycline, which is reported to exert anti-inflammatory effects, can modulate spatial memory. Again, the cafeteria diet produced persistent deficits in spatial memory (novel place recognition) that were prevented by minocycline cotreatment. Of interest, chow rats treated with minocycline performed worse than those treated with vehicle. Faecal microbiota alpha diversity was reduced by both cafeteria diet and minocycline, but these reductions were not associated with performance on the novel place task. However, abundances of specific OTUs within *Bacteroides* and *Lactobacillus* were associated with place task performance. Together, studies such as these suggest the gut microbiota could play a causal role in regulating behaviour. Current experiments are exploring the impact of faecal transfer on memory performance in rats consuming the obesogenic diet.

12:10-12:35

**SHAHRUL RAZID SARBINI**

Dean, Faculty of Agricultural and Food Sciences, Universiti Putra Malaysia

Prebiotics: An Asian Perspective

The Asian region being the largest and most populous continent on earth, signifies most diverse biological resource provides plentiful source of indigenous plants as prebiotic. This study will look at prebiotic plants that are available in Asia. An interesting source is sago starch, which is derived from palm (*Metroxylon sagu*) indigenous to South-East Asia, containing about 60 % resistant starch. Some in vitro and in vivo studies have demonstrated the ability of sago starch to increase numbers of *Lactobacillus* and

12:35-13:00

MICROBIOME OUTSIDE THE GUT

**JACQUES RAVEL**

Professor,
Microbiology and Immunology and
Associate Director for Genomics, Institute

for Genome Sciences, University of Maryland School of Medicine, USA

The vaginal microbiota: Translating microbiome science to novel therapies, a path forward

The vaginal microbiota forms the first line of defence against sexually transmitted infection (STIs). Population based surveys of the bacteria inhabiting the vagina have shown that several kinds of vaginal microbiota exist, that differs in bacterial composition and abundance. Further, in some women, these communities are dynamic and can change over short period of time, while in other, they are highly stable and do not change. The impact of both composition and dynamic of the vaginal microbiota on women's health and the susceptibility to diseases is becoming clearer through the application of modern genomic technologies, ecological principles and in vitro modelling. Our understanding of the interactions between the vaginal microbiota, the host and diseases has grown and now affords the rationale selection of consortium of bacteria, mimicking beneficial vaginal microbiota that could form the basis of novel and personalised strategies to maximize a woman's first line of defence, and women's health in general. Translational research and well-powered clinical trials are desperately needed to validate these approaches. Manipulation of the vaginal microbiota has the potential to change the way clinicians approach women's health and preventive care, as well as empower women to protect themselves.

12:10-12:35

**YOSHIHISA YAMASHITA**

Professor and Chairperson, Section of Preventive and Public Health Dentistry,

Division of Oral Health, Growth and Development, Kyushu University Faculty of Dental Science, Japan

Oral dysbiosis related to acetaldehyde production

Oral flora is the most expected candidate for acetaldehyde (ALD) causing oral or oropharyngeal cancer. Although *Neisseria* species are well known to be high amount-producers of ALD in vitro, no information is available regarding oral microbiota profiles related to ALD production. The salivary microbiota from 100 healthy males were classified into two

12:35-13:00

**GREGORY LAMBERT**

CEO, TargEDys,
Netherlands

Probiotics :**A natural way to regulate appetite**

TargEDys is a French clinical stage biotech company aiming to control metabolic disease by modulating the appetite through an intervention on the microbiome. TargEDys' innovative, satiety inducing technology (ProbioSatys), is based on a unique understanding of appetite regulation by the microbiome at the molecular level. Bacteria can send signals of satiety to the brain from the gut by molecularly mimicking satiety hormones, thus activating natural satiety pathways. This gut-brain axis is the bidirectional communication between the central and enteric nervous systems, linking the emotional and cognitive centres of the brain with peripheral intestinal functions. Gut bacteria are very important in influencing these interactions. The basis of TargEDys' ProbioSatys technology is a commensal, enterobacteria probiotic strain, *Hafnia alvei*, that produces the ClpB protein. ClpB is a mimetic of the satiety hormone (α -MSH) that regulates food behavior at both peripheral and central levels. When released, ClpB directly stimulates the intestinal enteroendocrine L-cells to produce satiety hormones. ClpB also enters the bloodstream to act on satiety regulation in the central nervous system by mimicking α -MSH. The resulting effect is the feeling of satiety or fullness after a meal. The mechanism of *Hafnia* has been proven in vitro and in vivo and is currently being tested in humans. This probiotic will be launched as a food supplement in April 2019. The preclinical results indicate that after 3 months of treatment customers can expect to safely lose 3-5% of their body weight, see a 5-10% reduction in food intake, improved body composition and activation of lipolysis.

12:10-12:35

**MING-JU CHEN**

Professor, Department of Animal Science and Technology, National Taiwan University, Taiwan

Shaping body weight through manipulating gut microbiome with probiotics

Surprisingly, two kefir probiotics, *Lactobacillus mali* APS1 (APS1) and *L. kefiranoferiens* M1 (M1), exhibited completely opposite results in anti-obesity. APS1 manipulated the gut microbiome's obesity-associated metabolites, followed by regulation of lipid metabolism, enhancement of energy expenditure and inhibition of appetite. The specific hepatic metabolites induced by the APS1-manipulated gut

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Bifidobacterium. Studies on the effects of resistant starch on the glycemia index, insulin responses, and satiety have been continuously progressing, proving its role as a functional food. The Asian region also offers plentiful herbs and spices that are used as traditional medicines since ancient times. Most are due to their bioactive compounds i.e. polyphenols or flavonoids. Most polyphenols are of low bioavailability, where their influence on health may be either through intestinal absorption or interaction with colonic microbiota. Root of turmeric (*Curcuma longa*) is widely used as condiment in Asian food as well as a traditional remedy in Chinese and Indian Ayurvedic medicine. The curcuminoid are metabolised by colonic microbiota, modulating the bacterial population and their metabolic activity.

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types of communities (A and B) using 16S rRNA gene sequencing. ALD production was significantly higher in the type A community, while relative abundance of *Neisseria* species was significantly lower in this type community. Even if adjusted for alcohol drinking and total amounts of salivary bacteria, the subjects with type A microbiota exhibited a significantly higher ALD production, as compared with those with type B microbiota. In addition, the relative abundance of *Neisseria* was negatively correlated with the acetaldehyde production ($P = 0.001$). We concluded that the salivary microbiota with lesser relative abundance of *Neisseria* species were independently associated with high ALD production, in spite of the high ALD production capacities of *Neisseria* species.

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microbiome also contributed to the amelioration of hepatic steatosis. While, M1 showed a reversed mechanism leading to higher body weight gain and body fat than their HFD counterparts. Our findings highlighted a possible microbiome and metabolome that contributed to shape the body weight and suggested that probiotics could serve as a potential therapy for modulating physiological function and downstream of the microbiota.

13:00-13:15

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13:15-14:20

Luncheon / Poster Presentations / One-to-One Meetings

PREBIOTICS

14:20-14:45

**ELIANA MARINO MORENO**

Principal Research Fellow and Immunology and Diabetes Laboratory Head, School of Biomedical Sciences, Monash University, Australia
Title TBC

**LARRY WEISS**

Persona Biome, USA

How can we talk about health care when we don't understand health and we don't care?

The emerging science of the microbiome is still in its infancy yet it is the driving force behind a transformative scientific revolution. What lies ahead will have broad implications for us as scientists, our companies and academic institutions, our health, and perhaps for our survival. It is worth reflecting on where we are today, how we got here, what we have learned so far, and the limitations of our methods and of our vision. I will discuss what we are learning about our biological past by studying the microbiota of minimally impacted hunter-gatherers in the Amazon and how it is challenging our deeply held ideas about human health that may inform our path forward.

14:45-15:10

R&D - HEALTH & DISEASES

14:20-14:45

**REBECCA SLYKERMAN**

Clinical Neuropsychologist and Senior Research Fellow, University of Auckland, New Zealand

Probiotic Supplementation of Pregnant Women and Infants: Relationships to Psychological and Neurocognitive Outcomes

Postnatal depression and anxiety affect a woman's risk of ongoing psychological problems and relationship with her baby. We conducted a randomised, double-blind, placebo-controlled trial of the effect of *Lactobacillus rhamnosus* HN001 in 423 New Zealand women. Results showed a significant reduction in postnatal depression and anxiety symptoms. There is pre-clinical evidence suggesting the gut microbiome is involved in developmental outcomes in childhood. Longitudinal cohort studies of children followed from birth through childhood suggest early antibiotic exposure is associated with poorer neurocognitive outcomes. The area of probiotic supplementation for improved neurocognitive outcomes is emerging. Early trials have not consistently found beneficial effects of probiotics and research is continuing to answer question about the role that antibiotics and probiotics play in childhood neurodevelopment.

14:45-15:10

**LEE YEONG YEH**

Professor of Medicine & Consultant of Gastroenterology, Hepatology & Internal Medicine, Universiti Sains Malaysia

Effects of environment insults on gut-brain axis and using probiotics for its restoration

The use of probiotics can relieve gut symptoms and psychological disturbance through restoration of microbial balance and the gut-brain axis. Recent research has shown an intricate relationship between host gut wall and luminal microbiota environment which is critical in maintaining gut health and psychological well-being. Some factors have been shown to affect gut microbiota, but environment is probably most important, for example, diet rather than genes has been shown to be the primary determinant of gut enterotype and obesity in Asian populations. Disruption of a stable microbiota composition (dysbiosis) due to an environmental insult from e.g. major flood, typhoon and air pollution; common disasters in the Asian region, can lead to gut-brain axis disturbance in the form of irritable bowel syndrome and anxiety. Thus, this presentation aims to discover the effects of environment insults on gut-brain axis and how probiotics can possibly be used in such conditions.

**DEV MITTAR**

Lead Scientist and Head of R&D ATCC, USA
Development and evaluation of site-specific standards for gut, skin, oral, and vaginal microbiome studies

The human microbiome is a rapidly growing field of research with the potential to become one of the most important tools for personalized health and precision medicine. To date, a significant body of work has been performed on the human gut microbiome to evaluate its species composition and influence on physiology; this research has led to additional studies on microbiomes localized at other sites on the human body (e.g., skin, oral, vaginal). However, a predominant limitation in these site-specific microbiome studies is the lack of appropriate and relevant standards to control the technical biases introduced throughout the metagenomics workflow. To address this, ATCC has developed a set of genomic and whole cell mock microbial communities from fully sequenced and characterized ATCC strains that represent species found in the oral, skin, gut, or vaginal microbiome. To further enhance the use of these standards and eliminate the bias associated with data analysis, we have also collaborated with One Codex to develop data analysis modules that provide simple output in the form of true-positive, relative abundance, and false-negative scores for 16S rRNA community profiling and shotgun metagenomics sequencing.

15:10-15:35

**HANNA SIDJABAT**

Honorary Fellow and Chief Investigator,
 University of Queensland Centre for Clinical Research, Australia

Probiotics for newborn babies: potential benefit to reduce the burden of neonatal sepsis

Probiotics types such as Lactobacilli and Bifidobacteria have been used for infants who have sepsis can be treated without any side effect. However, if the infants are in late stage of sepsis, probiotics can not be helpful outcome. The motility and maturity of gastric tract in neonatal can be improved by using probiotics. In this presentation, I will focus on the clinical trial applications of probiotics for newborn. There are several benefits of using probiotics for newborn babies: 1) The intestinal barrier resistant can be increased against the bacteria that crossing barrier and spread their poison. 2) modification the host reaction according to production of microbe; 3) mucosal response for IgA can be increased. 4) Anti-inflammatory such as Cytokines production can be raised. However, the benefit of probiotic activities relies on the dose in specific period time and on the species of bacterial strains.

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15:35

Closing Remarks / Conference Close

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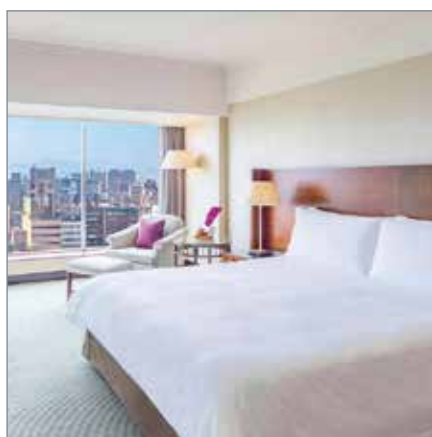
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