

ILSI SEAR conference  
proceedings: The gut, its  
microbes and health - new  
knowledge and applications for  
Asia

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ILSI

Southeast  
Asia Region

# Conference program

- Covered the following topics
  - Current scientific knowledge on the gut microbiome
  - Interactions with diet and nutrition
  - Implications for health and disease in Asian populations

# Outline

- Intestinal ecosystems in Asian populations
- Indigenous Asian foods that can help maintain a healthy gut microbiome
- Summary of panel discussion
- New developments in the region

# Intestinal ecosystems in Asian populations

- Speakers:
  - Prof. Yuan Kun Lee (*National University of Singapore, Singapore*)
  - Prof. Liping Zhao (*Shanghai Jiao Tong University, China*)

# Studies on intestinal ecosystems in Asian populations

- Prof. Zhao's study - Healthy young Chinese people aged 18 to 35 y across 9 provinces, urban/rural areas, diverse ethnic background
- Prof. Lee's study - Children aged 7 to 11 y in 5 countries, urban/less urban areas (Japan, China, Taiwan, Indonesia, Thailand)

**Asian Gut Microbiota Program**

# Findings (Chinese study)

In healthy Chinese

- Gut microbiota segregated by ethnicity, whether in urban/rural residence
- 9 genera shared by all subjects
- Species in each genera varied among individuals (suggesting that genus-level core co-evolves with the host under selection pressures)
- Changes in gut species were associated with changes in concentrations of urine metabolites

# Findings (Asian children study)

- Two distinct clusters of gut bacteria among Asians
  - Predominance of *Bifidobacteria* and *Bacteroides* - China, Japan, Taipei, Bangkok (Thailand)
  - Predominance of *Prevotella* - Indonesia, Khon Kaen (Thailand)
- Similar gut microbiota among different age groups living in the same location/same country

# Findings (Asian children study)

- *Prevotella* clusters (Indonesia, Thailand, Korea, SEA & African countries)
- May be driven by staple cereal (rice, millet) consumption
- Proposed study to determine role of resistant starch (from rice) on gut microbiota



# Indigenous Asian foods to maintain a healthy gut microbiome

- Speakers
  - Prof. Liping Zhao (Shanghai Jiao Tong University, China)
  - Prof. Ingrid Surono (Binus University, Indonesia/Indonesian Scientific Society for Probiotics and Prebiotics (ISSPP))

# Studies on indigenous Asian foods and gut microbiome

- Prof. Zhao - bitter gourd (berberine) and obesity, diabetes
- Prof. Surono - Indonesian *dadih* (fermented raw buffalo milk) and infection, allergy, immunity



# Findings (Bittergourd study)

- Berberine is traditionally used to treat diarrhea
- Also shown to be effective in treating diabetes and lowering cholesterol
- Berberine has low bioavailability (96% excreted), non-genotoxic but high efficacy

Trial among diabetic patients

- Treatment with traditional Chinese medicine containing berberine showed dose-dependent shifting of gut microbiota structure before & after treatment
- Microbial shift followed by improvement of fasting glucose and HbA1c levels

# Findings (Bittergourd study)

Trial among volunteers with BMI >30

- Dietary intervention for 9 wks
  - Traditional Chinese medicine with berberine
  - Whole grains
  - Prebiotics (fiber)
- Significant reduction
  - Enterobacteriaceae
  - Desulfovibrionaceae
- **Increase**
  - **Bifidobacteriaceae**
- Reduced inflammation & toxic metabolites in fecal water
- **Improved gut barrier function, insulin sensitivity, lipid profile, blood pressure**
- Significant reduction in body weight

# Findings (Indonesian *dadih*)

- 2 species of lactic acid bacteria isolated from *dadih* were shown to have good probiotic properties
  - Autoaggregation & intestinal adhesion
  - Inhibition of pathogen colonization
  - Ability to remove cyanobacterial microcystin LR

## Human studies

- Children with HIV
  - Significant effect on humoral mucosa immune response
- Normal preschool children
  - Increased salivary & fecal sIgA, zinc status
  - Increase in body weight of both normal & undernourished children

# Panel discussion

- Very little knowledge regarding the gut microbiome of Asian people
- Effects of probiotics are different in different populations (affected by differences in diet and environment, host genetics)

## Future research directions

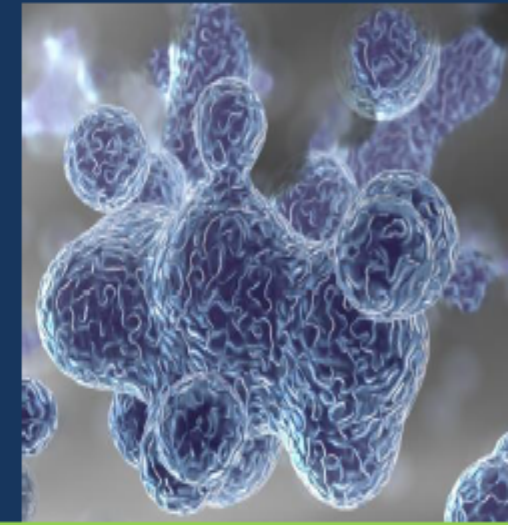
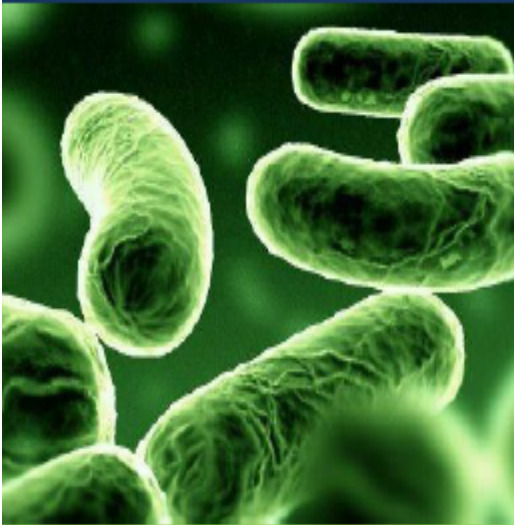
- Determine whether different populations have different foundation species
- Determine whether functions of the same bacterial species vary by population, age, gender
- Develop indigenous probiotics in Asia that will increase resistance to infection, improve nutritional status, prevent chronic disease among local populations

February 29 – 1 March, Kuala Lumpur, Malaysia



[www.globalengage.co.uk/microbiomeasia.html](http://www.globalengage.co.uk/microbiomeasia.html)

<http://www.globalengage.co.uk/probiotics-asia.html>



## 2<sup>nd</sup> Microbiome R&D and Business Collaboration Congress: Asia

COLLABORATIONS IN MICROBIOTA RESEARCH,  
PROBIOTICS, PREBIOTICS, HEALTH & DISEASE

&

## Probiotics Congress: Asia

RESEARCH, DEVELOPMENT &  
APPLICATION OF PROBIOTCS,  
PREBIOTICS AND NUTRACEUTICALS IN  
HUMAN HEALTH

## Characterizing the Microbiome Community

- Updates on the Asian gut microbiome project
- Can we characterize the 'normal' microbiome?
- Sequencing and bioinformatics of the human microbiome
- Panel Discussion: Developments and directions in regional microbiome research
- Host-microbiome communication
- Metagenomic and post-metagenomic approaches to microbiome research
- What is the scope of microbiome research – can it live up to the hype?
- Building a translation microbiome program
- Animal models in microbiome research
- Preservation and handling of fecal samples
- Human infant microbiome
- Gut microbiota as an emerging target for healthy ageing



## Probiotics, Prebiotics and Personalized Nutrition

- Dietary modulation of the human gut microbiome
- Gut microbiota in varying nutritional states
- Panel Discussion: Probiotics and functional foods
- Developing nutritional products utilising microbiome research
- Novel indigenous probiotics
- Role of the microbiome in food allergy
- Role of short-chain fatty acids
- Milk-oriented microbiota

## Collaboration, Investment and Commercialization

- Commercializing the microbiome – developing business relationships between academic research, pharma and investors
- Collaborations partnerships – the global scope of microbiome research/structuring successful collaborations
- Bringing live microbial products to market – IP, regulation, GMP
- Pharmaceutical involvement and development

THANK YOU

