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

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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/probiotics-asia.html

2nd Microbiome R&D and Business Collaboration Congress: Asia

Probiotics Congress: Asia

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

RESEARCH, DEVELOPMENT & APPLICATION OF PROBIOTICS, 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