

COLLOQUIUM BY LIPING ZHAO

GUT MICROBIOME: A NEW TARGET FOR MANAGING HUMAN HEALTH

TIME: 5-6PM, WEDNESDAY 4 MAY 2016

VENUE: AB 1087

Gut microbiome: a new target for managing human health

Speaker: Liping Zhao, Professor of Microbiology, Shanghai Jiao Tong University; Fellowship of American Academy of Microbiology

ABSTRACT:

Humans are superorganisms with two genomes that dictate phenotype, the genetically inherited human genome (25,000 genes) and the environmentally acquired human microbiome (over 1 million genes). The two genomes must work in harmonious integration as a hologenome to maintain health. Nutrition plays a crucial role in directly modulating our microbiomes and health phenotypes. Poorly balanced diets can turn the gut microbiome from a partner for health to a “pathogen” in chronic diseases, e.g. accumulating evidence supports the new hypothesis that obesity and related metabolic diseases develop because of low-grade, systemic and chronic inflammation induced by diet-disrupted gut microbiota. Due to the tight integration of gut microbiota into human global metabolism, molecular profiling of urine metabolites can provide a new window for reflecting physiological functions of gut microbiomes. Changes of gut microbiota and urine metabolites can thus be employed as new systems approaches for quantitative assessment and monitoring of health at the whole-body level with the advantage of measuring human health based on the results of interactions between the two genomes and the environment rather than just host genomic information. Large-scale population-based studies in conjunction with these whole-body level systems methods will generate pre-disease biomarkers with predictive power, thus making preventive health management of populations with rapidly changing disease spectrums possible through re-engineering of the imbalanced gut microbiomes with specially designed foods/diets.

BIO:

Prof Liping Zhao got his PhD in 1989 from Nanjing Agricultural University and worked in Cornell University as visiting scholar from 1993-1995. He is currently a distinguished professor for microbiology and the director of Laboratory of Microbial Ecology and Ecogenomics in School of Life

Sciences and Biotechnology, Shanghai Jiao Tong University. He is the director of the Laboratory of Nutritional Systems Biology in Shanghai Center for Systems Biomedicine. He is also the director the SJTU-Perfect (China) Joint Research Center on Microbiota and Health. He was executive director for Shanghai Center for Systems Biomedicine from 2005-2009. He was associate dean for School of Life Sciences and Biotechnology from 2003-2013. He served as a Board member of the International Society for Microbial Ecology from 2006-2012. He is a current editorial board member of *FEMS Microbiology Ecology*, *Scientific Reports*, and a senior editor of the *ISME Journal*. He was elected the fellowship of American Academy of Microbiology in 2014.

His team has been applying molecular and genomic tools for systems understanding and predictive manipulation of the complex microbial communities in human and animal guts. Liping has contributed significantly to the understanding of the role of the interactions between nutrition and gut microbiota in obesity and related metabolic diseases. He shows that traditional Chinese medicine and medicinal foods can help control obesity/diabetes with gut microbiota as a drug target, opening new avenues for managing the devastating epidemic of metabolic diseases. The *SCIENCE* magazine featured a story on how he combines traditional Chinese medicine and gut microbiota study to understand and fight obesity (Science 336: 1248).