

Division of Biostatistics Seminar Series

Microbiome data analysis in longitudinal study

Dr. Huilin Li

Associate Professor
NYU Langone Health
Director of NYU Biostatistics Resource
(NYUBR)
Director of Metagenomics/Microbiomics
Data Analysis Group



When: Friday, March 19, 2021
12:30pm - 1:30 pm

Registration Link via Zoom:

<https://wustl.zoom.us/meeting/register/tJUvce6tqz0jHNHS3J82Rs-CJB1mMK4ooB2o>



Title: Microbiome data analysis in longitudinal study

Recent research demonstrates that changes in the microbiome can have considerable health implications such as malnutrition, asthma, obesity, diabetes, and other conditions. This has further promoted substantial interest in the microbiome from both basic and clinical perspectives, and prospective longitudinal studies have been conducted to probe the mechanisms on how the microbiome affects health and disease. However, the special structure and characteristics of high-dimensional compositional microbiome data complicate effective analysis of microbiome data. In today's seminar, I will introduce two recent works in my group. One is a rigorous Sparse Microbial Causal Mediation Model (SparseMCMM) specifically designed for the high dimensional and compositional microbiome data in a typical three-factor (treatment, microbiome and outcome) causal study design. Our method can help scientists to dive deeper to uncover the causal role of microbiome in the underlying biological mechanism, by identifying the specific microbial agents and quantifying causal microbiome effects. The other one is a novel joint modeling framework, which is designed to handle the zero-inflated and highly skewed longitudinal microbial proportion data and examine whether the temporal pattern of microbial presence and/or the non-zero microbial proportions are associated with differences in the time to an event.