BRIGHAM AND WOMEN'S HOSPITAL
HARVARD MEDICAL SCHOOL

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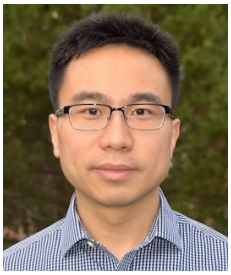
Department of Medicine
Channing Division of Network Medicine

Channing Microbiome Seminar

September 16 (Saturday), 2023, 9AM (ET)

Zoom: https://us02web.zoom.us/j/81070959105?pwd=RFJNd3dSZmR6dXJZNjJiYVVzQ3NEQT09
Meeting ID: 810 7095 9105
Passcode: 984617



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https://www.med.tsinghua.edu.cn/en/info/1351/1436.htm

Spatial coordination of metabolism in bacterial communities

Abstract: Microbial communities often display region-specific properties, which give rise to complex interactions and emergent behaviors that are critical to the homeostasis and stress response of the communities. However, systems-level understanding of these properties remains elusive. Here, we established RAINBOW-seq and profiled the transcriptome of *Escherichia coli* biofilm communities with high spatial resolution and high gene coverage. We uncovered three modes of community-level coordination, including cross-regional resource allocation, local cycling, and feedback signaling, which were mediated by strengthened transmembrane transport and spatially specific activation of metabolism. Because of such coordination, nutrient limited region of the community maintained unexpectedly high level of metabolism, enabling it to express many signaling genes and functionally unknown genes with potential sociality functions. Our work provides an extended understanding of the metabolic interplay in biofilms and presented a new approach of investigating complex interactions in bacterial communities on the systems level.

Bio: *Dr. Jintao Liu got bachelor's degree in physics from University of Science and Technology of China in 2004, got PhD in physics from University of Pittsburgh in 2011, did postdoctoral research at University of Pittsburgh between 2011-2012 and at University of California San Diego between 2012-2017. He became Principal Investigator at Tsinghua University School of Medicine in 2017. Dr. Liu and his team study bacterial biofilms, which are densely packed bacteria communities. Biofilms are highly resistant to drugs and to our immune systems, causing serious health problems. Using interdisciplinary and quantitative approaches, they focus on developing innovative technologies to investigate biofilms, uncovering the underlying mechanisms and principles governing their dynamical properties and antibiotic resistance, and the implications for human health.*

Hosted by Yang-Yu Liu