NUS National University of Singapore

Infectious Diseases Translational Research Programme
Yong Loo Lin School of Medicine

Research Seminar

WEBINAR !

BACTERIAL

COMPETITION IN THE GUT: LESSONS FROM A COMMENSAL STRAIN

DR YASSINE CHERRAK
THE HARDT LAB
INSTITUTE OF MICROBIOLOGY
ETH ZÜRICH

3rd October 2024/ Thursday

2:30 P.M. - 3:30 P.M. (SGT)

Chairperson: Associate Professor, Gan Yunn Hwen

Abstract:

The gut microbiota plays an essential role in human health, particularly through its ability to mitigate enteric pathogens invasion. This defence mechanism, referred to as colonization resistance, can be traced up to specific protective commensal strains exerting pathogen-displacing abilities. Despite being first described in the 1950s, our comprehension of how commensal bacteria provide protection against enteric pathogens remains unclear, with only a few protective strains characterized. Recently, we isolated a murine gut E. coli commensal strain (E. coli 8178) displaying a striking ability to eliminate Salmonella enterica serovar Typhimurium, a leading cause of gastroenteritis worldwide, in a Salmonellosis mouse model. Combining in vitro and in vivo approaches, we deciphered the molecular mechanism driving pathogen exclusion by E. coli 8178, while uncovering novel principles of bacterial competition in the gut. In addition to enhancing our understanding of bacterial antagonistic relationships, our work illuminated the contribution of the host and diet to pathogen displacement by protective commensals, opening exciting novel research avenues at the interface between the host, diet and microbiota-mediated colonization resistance.

Biography:

Yassine completed his studies in Marseille, France, and got a Master's degree in Microbiology and an additional Master's degree in Biological Engineering/Biotechnology. He then pursued a PhD at the CNRS (National Center for Scientific Research) and Aix-Marseille University, working in the group of Eric Cascales, a leading expert in bacterial secretion systems. During this time, Yassine became fascinated by the Type VI secretion system, a bacterial molecular device involved in bacterial competition, which his studied from both functional and structural perspectives. Afterward, Yassine decided to expand his expertise in bacterial competition to the in vivo context. He was awarded an EMBO Postdoctoral Fellowship and joined the group of Wolf-Dietrich Hardt at ETH Zurich in 2021, working on fascinating aspects of microbial interactions and Salmonellosis in the gut. Yassine is a member of the NCCR Microbiome consortium and a formed editor at Nature Microbiology where he worked for 6 months during the pandemic.

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