



DR DALONG HU

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The Centre for Infectious Diseases and Microbiology - Public Health presents

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2pm-2.45pm (AEST)

CIDM-PH WEBINAR

Pre-emptive epidemiology: a One Health approach to cost-effective precision surveillance of AMR pathogens

Current epidemiology surveillance can only trace the evolution and spread of pathogens after the pandemics happened. Today, in this post-COVID19 era, there is an even more urgent need for a pre-emptive epidemic surveillance technology that provides early warning before harmless environmental microorganisms evolve into serious pathogens. However, the use of current approaches, such as genomic sequencing, are labour intensive and not economically feasible for large-scale monitoring of evolving potential pathogens in the environment. Thus we developed a new technique based on culture enrichment metagenomic sequencing. It allows us to enrich and sequence the microbial communities from environmental samples, such as water, soil, or air. We applied this technique to samples collected from St John's Island in Singapore, which is a popular tourist destination and a potential hotspot for disease transmission. The results show that the novel technique can detect more pathogens or potential pathogens or antibiotic-resistant bacteria than conventional methods. It can also track their spread and evolution over time and space. Furthermore, it can reveal the horizontal gene transfer of antibiotic resistance genes among environmental bacteria. These findings have important implications for public health surveillance and intervention strategies.

Dr. Dalong Hu specializes in microbiology, epidemiology, and bioinformatics for clinical pathogens detection, infectious diseases diagnosis/tracing/control/prevention and intestinal bacteria with their effect on health. He was awarded a Ph.D. in the field of bioinformatics at the University of Sydney in 2019 in Prof Peter Reeves and A/Prof Andrew Holmes lab and started his postdoctoral career at the University of New South Wales in the field of epidemiology from 2019 to 2020 in Prof Ruiting Lan's lab. From 2021, he moved to Singapore joining A/Prof Yann F. Boucher lab in National University of Singapore as a research fellow for studying the spread of antimicrobial resistant bacteria in coastal environments. His research included the investigation of the origin of the 7th cholera pandemic and prognostic factors in elderly COVID-19 patients.

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