



# NCID MONTHLY RESEARCH MEETING

*BRINGING PEOPLE TOGETHER,  
BRIDGING SCIENCE AND MEDICINE*

**21 Jul 2023 | Friday | 11.00am – 12.00pm**

## About the Meeting

Our research meetings are held every third Friday of the month, with the aim to:

- Inspire research ideas and participation
- Provide guidance on research studies
- Foster research collaborations

## Who Should Attend

All who are interested in research are welcome to attend.

## NCID Catalyst Grant

The NCID Catalyst Grant, funded by MOH, encourages inter-institutional collaborative research in infectious diseases and public health. It is awarded to new Principal Investigators and researchers from academic institutions and hospitals. The FY22 Catalyst Grant awardees will be sharing their project findings in a 10mins presentation, inclusive of Q&A.

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| 11:00 AM | <b><i>Escherichia coli</i> Has Robust Regulatory Mechanisms Against the Elevated Peptidoglycan Cleavage by Lytic Transglycosylases</b><br>Asst Prof Qiao Yuan  |
| 11:10 AM | <b>Comparative Phylogenomics to Understand Diversity, Population Structure and Antimicrobial Resistance in the Mycobacterium Avium Complex (MAC)</b><br>Dr Jeanette Teo  |
| 11:20 AM | <b>An Evidence-based Serious Game App for Public Education on Antibiotic Use and Antimicrobial Resistance</b><br>Dr Huang Zhilian  |
| 11:30 AM | <b>Dengue Virus Exhibit Serotype-specific Interactions with the Host During Infection</b><br>Dr Alvin Tan  |
| 11:40 AM | <b>Prevalence of Antibiotic Resistance Among Preterm Infants with Sepsis: A Population-based Cohort Study</b><br>Dr Goh Guan Lin   |
| 11:50 AM | <b>Does One Combo Fit All? Azithromycin vs Clarithromycin in Combination with Rifabutin for Synergistic <i>in vitro</i> Activity Against <i>Mycobacterium abscessus</i> Clinical Isolates</b><br>Dr Dinah Binte Aziz |

## To Register

Visit <https://for.sg/jul23researchmeeting> or scan QR code.

This will be a Zoom session. \*CME/CNE/CPE points will be awarded



## ***Escherichia coli* Has Robust Regulatory Mechanisms Against the Elevated Peptidoglycan Cleavage by Lytic Transglycosylases**

by **Asst Prof Qiao Yuan**

Assistant Professor

School of Chemistry, Chemical Engineering and Biotechnology, NTU



Bacterial peptidoglycan is an essential and conserved polymeric component in bacteria. Bacterial survival requires balanced peptidoglycan synthesis and breakdown. Perturbations of the peptidoglycan processes may afford new antimicrobial strategies. In this study, we characterized the cellular phenotypes of *E. coli* when the peptidoglycan cleavage is upregulated.

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## **Comparative Phylogenomics to Understand Diversity, Population Structure and Antimicrobial Resistance in the *Mycobacterium Avium* Complex (MAC)**

by **Dr Jeanette Teo**

Principal Scientific Officer

Department of Laboratory Medicine, NUH



Comparative phylogenomics to understand diversity, population structure and antimicrobial resistance in the *Mycobacterium avium* complex (MAC). Utilizing whole genome sequencing to investigate the distribution of clinical *M. avium* complex (MAC) species and their genetic mechanisms underlying drug tolerance and resistance.

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## **An Evidence-based Serious Game App for Public Education on Antibiotic Use and Antimicrobial Resistance**

by **Dr Huang Zhilian**

Senior Research Fellow

Department of Preventive and Population Medicine, TTSH



Public knowledge on appropriate antibiotic use and antimicrobial resistance (AMR) remained low despite ongoing health promotion efforts. Given the popularity of app gamification for health promotion in recent years, we co-developed an evidence-based serious game app—“SteWARdS Antibiotic Defence”—with Temasek Polytechnic and evaluated its effectiveness in improving the knowledge of, attitude toward, and perception (KAP) of appropriate antibiotic use and AMR among the public. We present the findings of our evaluation and the lessons learnt from the conduct of this trial.

## Dengue Virus Exhibit Serotype-specific Interactions with the Host During Infection

by **Dr Alvin Tan**

Senior Research Fellow

Emerging Infectious Diseases, Duke-NUS Medical School, NUS



Most dengue virus studies have been based on DENV serotype 2 (DENV2). The low sequence identity (~70%) amongst the four DENV serotypes indicates a huge gap in the field's knowledge of DENV. I will discuss our efforts to identify human proteins and pathways that interact with DENV1 and DENV2 during infection using comparative systems approaches.

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## Prevalence of Antibiotic Resistance Among Preterm Infants with Sepsis: A Population-based Cohort Study

by **Dr Goh Guan Lin**

Senior Staff Registrar

Department of Neonatology, KKH



Sepsis is a significant cause of mortality and morbidity among preterm infants. This, coupled with reports of increasing rates of antimicrobial resistance, is alarming. We aim to describe the local prevalence of antibiotic resistance in preterm infants with sepsis in the Neonatal Intensive Care Unit across KKH, SGH and NUH, which care for >80% of very low birthweight infants in Singapore. In our cohort, 25% infants died, out of which 77% was attributed to sepsis. Gram-negative bacteria account for the majority of sepsis episodes for both survivor and non-survivor groups. Among Gram-negative organisms, resistance to commonly used antibiotics was common.

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## Does One Combo Fit All? Azithromycin vs Clarithromycin in Combination with Rifabutin for Synergistic *in vitro* Activity Against *Mycobacterium abscessus* Clinical Isolates

by **Dr Dinah Binte Aziz**

Research Fellow

Department of Medicine, School of Medicine, NUS



*Mycobacterium abscessus* is a difficult to treat highly drug resistant opportunistic pathogen. Combination antibiotics are routinely used but there are scant supporting clinical and laboratory data. We analysed 39 clinical isolates with checkerboard assays and found that *in vitro*, clarithromycin is more potent than azithromycin against our *M. abscessus* clinical isolates, the combination of rifabutin with clarithromycin is synergistic against more isolates than the rifabutin with azithromycin and the synergy between clarithromycin and rifabutin is not limited only to strains with functional *erm41*. Synergistic combinations may have a role for other *M. abscessus* strains, regardless of subspecies.