Organised by

National Centre for Infectious Diseases

NCID MONTHLY RESEARCH MEETING:

BRINGING PEOPLE TOGETHER,

BRIDGING SCIENCE AND MEDICINE

21 Jan 2022 | Friday | 11.00am – 12.30pm

About the Meeting

Our research meetings are held every 3rd Friday of the month, with the aim to:

1) Inspire research ideas and participation
2) Provide guidance on research studies
3) Foster research collaborations

Who should attend

All who are interested in research are welcome to attend.

To register

This will be a Zoom meeting.
Please register using the link or QR code below.
http://tiny.cc/Jan2022researchmeeting

*CME/CPE points will be awarded

Programme

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 of academic institutions and hospitals.

The FY20 Catalyst Grant awardees are invited to share their project findings in a 10mins presentation, inclusive of Q&A.

11:00 AM **Dr Chew Ka Lip**
National University Hospital

11:10 AM **Dr Andrew Teo**
Lee Kong Chian School of Medicine

11:20 AM **Dr Martin Linster**
Duke-NUS Medical School

11:30 AM **Dr Elaine Lum**
Duke-NUS Medical School

11:40 AM **Dr Nalini Puniamoorthy**
National University of Singapore

11:50 AM **Dr Vanessa Koh**
National Centre for Infectious Diseases

12:00 PM **Dr Ritu Jain**
Nanyang Technological University
and Dr Rayner Tan
University of North Carolina Project-China

Genomic epidemiology of candidaemia isolates

by **Dr Chew Ka Lip**

Consultant
Department of Laboratory Medicine, National University Hospital

Invasive candida infections are thought to be driven by endogenous sources. However, in recent years, sequencing data has demonstrated horizontal transmission of Candida spp. in healthcare settings. This is not limited to globally disseminated Candida auris but is also seen in non-auris Candida spp. The findings in our hospital are discussed in the context of rising antifungal resistance, with potential infection control implications.

Citrullinated histone 3 is associated with cardiac dysfunction and severe disease in adults with dengue

by **Dr Andrew Teo**

Dean Fellow
Lee Kong Chian School of Medicine, Nanyang Technological University

Cardiac dysfunction contributes to pathogenesis of severe dengue. Extracellular histones released by neutrophils have been shown to mediate cardiac dysfunction in sepsis but have not been measured in dengue. In a prospective longitudinal study, blood was collected and assayed serologically for citrullinated histones H3, Troponin-T and NT-ProBNP. Cardiac parameters (stroke index, stroke volume and Grannov-Goor Index) were documented. In critical phase, cardiac parameters associated with cardiac dysfunction were decreased in severe dengue.

Citrullinated histones 3 levels were elevated in severe dengue, and levels correlated inversely with cardiac parameters. Citrullinated histones 3 may have a role in mediating cardiac dysfunction in dengue

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Airborne transmission of seasonal coronaviruses

by **Dr Martin Linster**

Senior Research Fellow
Programme in Emerging Infectious Diseases, Duke-NUS Medical School

Epidemic coronaviruses circulate globally as four distinct virus species. They generally cause mild infection, but can lead to severe lower airway infection predominantly in children, elderly, and immunocompromised individuals. The upper respiratory tract and in particular the nasal mucosa is the initial interface encountered by airborne viruses during the infection process. In an attempt to mimic respiration and coronavirus transmission in humans, a custom-made in vitro setup that allows exposure of nasal cells cultured at an air liquid interface to air passed via infected cells in a two-chamber system and infection results of sixteen coronavirus isolates are presented.

The truth about antibiotic-taking behaviours in Singapore

by **Dr Elaine Lum**

Assistant Professor
Health Services & Systems Research, Duke-NUS Medical School

A recent 10-year review of antimicrobial resistance in Singapore highlights gaps in appropriate antibiotic use in the community setting and in engaging consumers. While consumers are important partners in reducing inappropriate use of antibiotics, obtaining accurate data on consumer behaviour and preferences is difficult. We used innovative methods to better understand consumer antibiotic use behaviours in Singapore, estimated the prevalence of undesirable behaviours, and analysed past antimicrobial resistance campaigns. We present key findings and propose recommendations to enable more precise targeting of future campaigns, strategies, and nudges.

Barriers and corridors of gene flow in mosquito-borne disease transmission

by **Dr Nalini Pooniamoorthy**
Assistant Professor
Department of Biological Sciences, National University of Singapore

The highly adaptable Asia tiger mosquito (Aedes albopictus) is a vector for dengue, chikungunya and various other disease-causing flavivirus. However, little is known about the dispersal of this species in an urban city with various fragmented habitats (forest, peri-urban and urban areas). Using a Next Generation Sequencing approach involving thousands of genomic markers, we showed that heterogenous landscapes influences Aedes albopictus dispersal even on a small geographic scale, isolation-by-distance notwithstanding.

Additionally, individuals within a habitat category are genetically more similar, suggesting low-level localised adaptations. Demographic history analysis revealed a decline in the effective population size from around 50 years ago.

Rapid dominance of a carbapenemase-encoding plasmid in clinical Enterobacteriaceae isolates and hypervirulent Klebsiella pneumoniae

by **Dr Vanessa Koh**
Scientific Officer
Infectious Disease Research Laboratory, National Centre for Infectious Diseases

Spread of carbapenemase-encoding plasmids (CP) jeopardizes the effectiveness of antibiotic treatment. Based on whole-genome analysis of 1,126 clinical Enterobacteriaceae isolates, we identified pKPC2 as the dominant CP in Singapore over 5 years. Rapid spread of pKPC2 can be attributed to its high conjugation frequency and stability in various Enterobacteriaceae, including hypervirulent Klebsiella pneumoniae.

pKPC2 can move easily into different species, even into hypervirulent bacteria with thick capsules, traditionally thought to be a major barrier to conjugation. It has evolved to be very well-adapted for transmission and carriage. CPs such as pKPC2 are a cause for concern due to their potential to cause disease beyond nosocomial settings.

Effect of stigma and discrimination on health decisions on PLHIV: Centering the patient voice?

by **Dr Ritu Jain**
Lecturer
School of Humanities, Nanyang Technological University

and **Dr Rayner Tan**
Postdoctoral Fellow
University of North Carolina Project-China

In this presentation, the investigators offer an update on the status of, and share preliminary findings from the near-completion study investigating stigma and discrimination as factors in late diagnosis and treatment presentation for people living with HIV. Preliminary analysis of qualitative interviews indicates that experienced and perceived stigma constitute significant barriers.

Experiences of stigma happens in both online and physical spaces and constitutes a barrier in healthcare decisions. In these, religion plays an important role is both containing as well as contributing to discrimination. Finally, perceived stigma can be traced to a lack of clarity around legal boundaries and rights as well as fear of punitive measures.