

Teaching Seminar

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Role of serology in infectious disease investigation

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The adaptive immunity (B cells, CD4+ and CD8+ T cells), following virus infection or vaccination, is essential for controlling viral infections. One of the important components of adaptive immunity is antibodies. In this seminar, I will describe the evolution of antibody detection methodology and use COVID-19 pandemic as an example to illustrate the important roles that serology can play in outbreak investigation and response.

Learning points

1. Historical review of serology in infectious disease investigation.
2. Functional differentiation between binding and neutralizing antibodies.
3. Neutralizing antibodies as an important immune correlate of protection.
4. Serology-based findings in contact tracing and transmission/exposure among human and animals.



Dr Tan Chee Wah

Senior Research Fellow

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Biography

Dr Tan Chee Wah obtained his Ph.D. from the University of Malaya in 2014, on enterovirus A71-host interactions. In 2017, he joined Professor Wang Linfa's lab, mainly working on bat-borne viruses, including bat filoviruses, coronaviruses, and orthoreoviruses. During the COVID-19 pandemic, his focuses were on SARS-CoV-2 serology, origin, and virus-host interaction. He led the invention of the SARS-CoV-2 surrogate neutralization test, which was commercialized by Genscript under the trade name cPass™ and was the first serology test for SARS-CoV-2 neutralizing antibodies (NAbs) that was granted US FDA EUA approval. Since then, he has established a sophisticated multiplex sVNT, which can detect NAbs against SARS-CoV-2 variants of concern and other SARS-related coronaviruses that use ACE2 receptors. His recent works generated great impact with publications in *New England Journal of Medicine*, *Nature Biotechnology*, *Lancet Infectious Diseases*, and *Nature Microbiology*.

Recommended Readings

1. Yong SEF et al. Connecting clusters of COVID-19: an epidemiological and serological investigation. *The Lancet Infectious Diseases* 2020, 20(7): 809-815.
2. Wacharapluesadee S et al. Evidence for SARS-CoV-2 related coronaviruses circulating in bats and pangolins in Southeast Asia. *Nature Communications* 2021, 12(1): 1-9.
3. Chandler JC et al. SARS-CoV-2 exposure in wild white-tailed deer (*Odocoileus virginianus*). *PNAS* 2021, 118(47): e2114828118.
4. Khoury DS et al. Neutralizing antibody levels are highly predictive of immune protection from symptomatic SARS-CoV-2 infection. *Nature Medicine* 2021, 27: 1207-1211.
5. Amanat F et al. A serological assay to detect SARS-CoV-2 seroconversion in humans. *Nature Medicine* 2020, 26: 1033-1036.



18th August 2022
12pm (SG Time)

Venue

MD4 Level 2
Seminar Room

