



Infectious
Diseases Labs

ID LABS



Prof Jason Mackenzie

Lab Head

Doherty Institute/University of Melbourne



Friday 22nd November 2024

11:00 AM to 12:00 PM (SGT)

Venue: Codon A & B, L5 Matrix Building

Norovirus Replication: Live and Let Die

Norovirus infection is a global health problem and it is estimated that ~10% of the world population suffer an infection each year. The infection is characterized by projectile vomiting and profuse diarrhoea, yet surprisingly there are no available preventative or treatment options currently available. This is primarily due to the lack of efficient in vitro virus cultivation system. Within this report we have used the model norovirus, mouse norovirus or MNV, and investigated the role of the virus encoded protein NS3 in potentiating cell death within infected cells. We show that the initiation of cell death is promoted due to the depletion of the cell pro-survival protein induced by both virus infection and expression of the NS3 protein alone. We have showed that this biochemical characteristic is conserved between mouse and human viruses and mapped the functional domain within the NS3 protein. Intriguingly this initiation of cell death appears to promote a potential transmission route that may evade antibody neutralisation. This research has identified a mechanistic role for the NS3 protein during the norovirus replication cycle and pathogenesis.

Prof Jason Mackenzie is a Teaching and Research Academic and Virology Group Leader within the Department of Microbiology and Immunology in the Peter Doherty Institute for Infection and Immunity, at the University of Melbourne. He has had an esteemed 27 years of research experience that culminated in his promotion to Professor at University of Melbourne in 2018. His research is predominantly on the +ssRNA flaviviruses and caliciviruses, in particular, the cell biology principles utilized during virus infection, and the processes of viral RNA replication, understanding the events of virus replication and how these processes influence cellular functions, and the influences virus replication imparts on immune regulation and dysfunction. He has established a niche position by incorporating multi-faceted approaches that investigate molecular, biochemical, ultrastructural, biological and immunological aspects to virus replication in cells. In particular his expertise in electron-microscopy has been recognised nationally and internationally where he has collaborated with many groups to perform and interpret electron microscopy. He has been instrumental in the elucidation of the flavivirus and norovirus replication complex in terms of viral proteins and utilization of cellular membranes. He has proposed roles for both cellular organelles and the cytoskeleton during these processes. He was one of the few groups internationally to reveal the flavivirus replication complex in 3D utilizing state-of the art electron tomography. He was involved in the identification of the first ever tissue system to investigate norovirus replication. Recently he had investigated the intracellular events associated with virus replication and how both cellular stress and lipid biosynthetic pathways affect virus replication and cellular immune competency. He is currently investigating how intracellular replication of West Nile, dengue, SARS-CoV-2 and Norovirus modulates host processes to promote efficient virus replication and viral immune evasion.

Hosted by: Dr Stefan Oehlers

Seminar is open to all. No registration required.

Questions? Contact us at seminars@idlabs.a-star.edu.sg

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