Mitochondrial manipulations by flaviviruses

With no available therapies, infections with flaviviruses constitute a major public health concern worldwide. While dengue virus (DENV) causes the most prevalent arthropod-borne viral disease and may be fatal, Zika virus (ZIKV) infection in utero can lead to severe neurodevelopmental defects in newborns, including congenital microcephaly. In Canada, West Nile virus is endemic and causes severe encephalitis and eventually death. Thus there is an urgent need to better understand flavivirus pathogenesis at the molecular level in order to identify novel antiviral targets.

In order to generate an intracellular environment favorable to viral replication, flaviviruses induce the morphogenesis of organelle-like viral replication factories (vRF) via poorly understood mechanisms. These vRFs host viral RNA replication and regulate several processes important for viral pathogenesis. In addition, vRFs make contacts with mitochondria, which in turn exhibit an altered morphology. This correlates with drastic perturbations in their composition, metabolic activity and contribution to critical antiviral processes such as innate immunity and apoptosis. However, the molecular mechanisms governing this flavivirus-mediated mitochondrial reprogramming and how this impact on viral replication remain mostly enigmatic.

We will present our latest results focusing on how DENV and ZIKV infections perturb mitochondrial morphology and functions to generate a cytoplasmic environment prone to a sustained replication.

Zoom Meeting Details:
Meeting link: https://usask-ca.zoom.us/j/94575415002?pwd=MUs0Vm1DNHRuSlpIVWhjN0J0TEExUQ9
Meeting ID: 945 7541 5002
Passcode: 40240620
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