## oo<sub>5</sub>80 The Role of MFSD<sub>2</sub>a in Zika Virus Infections

Clement Yau, Esther Gan, Bryan Cassidy Tan, Bernice Wong, Chan Jia Pei, Debra Quek, Dwight Galam, David Silver, Ooi Eng Eong Duke-NUS Medical School

**Aims:** Zika virus (ZIKV) has emerged to be an important cause of congenital disease, imposing lifelong disabilities on its victims. Its alarming ability to cause microcephaly, congenital malformations and fetal demise is partly due to its capability to breach protective barriers such as the placenta, ultimately crossing the blood brain barrier (BBB) and infecting the central nervous system (CNS). However, the mechanism of how ZIKV breaches these barriers still remains poorly understood. Here we hypothesize that DHA enrichment via its transporter MFSD2a reduces ZIKV infections in the BBB and placenta.

**Methodology:** Neural progenitor cells (NPC) were infected with ZIKV and viral internalization was quantified. Additionally, MFSD2a whole body, placenta or BBB knockout and wildtype mice were infected with ZIKV. Survival and weight of mice were observed and viral load in serum and organs were quantified.

**Result:** MFSD<sub>2</sub>a KO NPCs showed increased internalization 2 hours post infection (hpi). Adult whole body MFSD<sub>2</sub>a KO mice infected with ZIKV resulted in 100% lethal infection (Figure 3A) and weight loss (Figure 3B) but not in WT mice. Furthermore, lower vial load was observed in high MFSD<sub>2</sub>a expressing organs such as the brain<sup>19-21</sup>, eyes, testes and epididymis (Figure 4a) but not in the unfasted liver and spleen (Figure 4b) which are low MFSD<sub>2</sub>a expressing organs<sup>21,22</sup>. Additionally, higher serum viral load was observed in whole body MFSD<sub>2</sub>a knockout (KO) adult mice as compared to its wildtype (WT) counterpart upon ZIKV infection.

**Conclusion:** Collectively, both the in vitro and in vivo results clearly demonstrate the potential protective effect of MFSD<sub>2</sub>a transport activity in ZIKV infections.