Abstract

Enterovirus 71 (EV71) is considered as the most important neurotropic virus after the eradication of poliovirus. With no clinically approved vaccines or antiviral drugs against EV71, elucidating the mode of action involved in EV71 neuropathogenesis is essential. Our lab has recently established a novel in vitro infection model to understand the neurovirulence of EV71 using the murine motor neuron cell line, NSC-34. Using this novel model, a 2-dimensional gel electrophoresis proteomic approach was employed to profile the differential expression of host proteins during viral infection. By mapping the interactions between EV71 and host cellular proteins, prohibitin (PHB) was identified as a potential host factor involved in EV71 infection cycle. Down-regulation of PHB expression by siRNA gene knockdown confirmed the role of PHB in EV71 infection of NSC-34 cells. Furthermore, using specific antibodies, we showed that blocking PHB expressed at the cell surface impaired viral entry in NSC-34 cells. In addition, we generated strong experimental evidence supporting that intracellular PHB expressed on the mitochondrial membrane interacts with non-structural proteins (3CD) of EV71, thus suggesting a role of this host protein during the viral genome replication. Together, these findings support that PHB plays an important role during EV71 infection cycle in NSC-34 cells, at both the virus entry and replication steps. Importantly, similar observations were made with human neuroblastoma cells but not with human muscle cells, thus suggesting that the role of PHB during EV71 infection is limited and specific to neuronal cells, and contributes to the neurovirulence of EV71.

Biography

Issac obtained his BSc (Hons.) of Life Sciences from NUS in 2014, before joining Sylvie Alonso’s lab to further his graduate studies. Issac is currently working with human Enterovirus 71. His main interest is to study the viral-host interactions and decipher the mechanisms of EV71 neuropathogenesis.