WEN CHUNG, Toronto Metropolitan University

Beyond pure chance: explaining cytomegalovirus infection outcomes using a cytokine response model

Cytomegalovirus (CMV) is one of the most ubiquitous herpesviruses, usually causing asymptomatic or mild primary infections in immunocompetent individuals as it establishes latency in the host. However, in neonatal infants, primary infections originating from contact with individuals shedding CMV can have more serious consequences and are particularly dangerous for pre-term infants. Observational studies have found that the majority of CMV infections in neonatal infants tend to be transient infections, where latency is not established in the host. Previous mathematical modelling efforts have claimed this to be a stochastic effect. Using a deterministic differential equation model of CMV infection in the salivary glands and virtual populations, this presentation will show that a significant fraction of these transient infections, as well as the increased vulnerability of pre-term infants to CMV infection, may be explained by the action of cytokines such as interferon and age-related differences in their effectiveness and production rates.