Isabel Yee Pinn Tsin Yee et al., J Antivir Antiretrovir 2016, 8:5(Suppl)
http://dx.doi.org/10.4172/1948-5964.C1.033

Identification of molecular determinants in Enterovirus 71 genome

Isabel Yee Pinn Tsin Yee, Kuan Onn Tan and **Chit Laa Poh**
Sunway University, Malaysia

The hand, foot and mouth disease is caused by a group of Enteroviruses such as Enterovirus 71 (EV-A71) and Coxsackieviruses. Mild symptoms of EV-A71 infection in children range from high fever, vomiting, rashes and ulcers in mouth. EV-A71 can produce more severe symptoms such as brainstem encephalitis, leading to cardiopulmonary failure and death. The lack of approved vaccines against EV-A71 highlights the urgency of developing preventive agents against EV-A71 to prevent further fatalities. The molecular basis of virulence in EV-A71 is still uncertain. In this study, the EV-A71 virus (5865/Sin/000009) was genetically modified by substituting nucleotides at positions 2735, 2875, 3167, 3173, 6129 and creating a partial deletion (PD, Δ11bp) of the 5'-NTR region. Amongst the 6 mutants, mutants 2735, 3167 and 3173 were constructed through codon-deoptimization. The virulence of the mutated EV-A71 strains was evaluated in rhabdomyosarcoma cell culture by tissue culture infectious dose (TCID50) determinations and real time Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR). Mutants 2735 and 3173 had minimal cytopathic effects when compared to mutants 2875, 3167, 6129 and PD when transfected into RD cells. This was consistent with the RT-PCR results that showed the viral RNA copy number for mutants 2735, 3173 and 6129 to be of lowest amount. Analysis of the TCID50 values indicates that mutants 2735 and 3173 were attenuated five-fold as compared to the wild type. Hence, the nucleotides at C2735 and C3173 maybe potential molecular determinants in EV-A71 and should be subject to further evaluations by other tests *in vitro* and *in vivo.*

Biography

Isabel Yee Pinn Tsin Yee was from the University's Scholars Program in the National University of Singapore (NUS) and graduated with Honors in Biochemistry. She is currently pursuing PhD in Biology and has completed MSc in Life Sciences with Distinction from Sunway University and Lancaster University, UK. She has received the Tan Sri Dato Jeffrey Cheah Scholastic Award for outstanding academic excellence. She was a Module Coordinator for the Diploma of Medical Biotechnology in Singapore Polytechnic where she received the Most Outstanding Mentor Award from Singapore's Ministry of Education. She is currently a Research Fellow from the Research Centre for Biomedical Sciences at Sunway University.

isabely@sunway.edu.my

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