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Antiviral activity of the D-SP40 peptides against Enterovirus-A71

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Enterovirus 71 (EV-A71) is one of the major etiological agents responsible for hand, food and mouth disease (HFMD) in children, apart from Coxsackievirus A16. The small, single-stranded, positive-sense RNA virus can cause varied clinical manifestations such as high fever, vesicles and neurological diseases. Large scale HFMD outbreaks have been reported in China and the neighboring countries since 2008. Currently, there are two inactivated EV-A71 vaccines that have been approved but only available in China. To enable the worldwide use of inactivated EV-A71 vaccine, prevention against various EV-A71 genotype/sub-genotype strains needs to be demonstrated. Peptides that can block viral attachment or entry into host cells, on the other hands, offer the therapeutic potentials. In this study, we have discovered three (15-mers) synthetic peptides which could be developed as a potential antiviral for inhibition of EV-A71. The peptides were derived and modified from the highly conserved amino acid sequence across all EV-A71 genotypes and sub-genotypes. The D-SP40, D-NH_2-SP40 and D-Ac-SP40 peptides were found to significantly reduce cytopathic effects of the EV-A71 with the IC_{50} values ranging from 11.29-18.44 μM in Rhabdomyosarcoma (RD) cells. The *in vitro* inhibitory effect of the D-SP40 peptides exhibited a dose dependent concentration corresponding to a decrease in infectious viral particles and total viral RNA. The mechanism of action studies suggested that the D-SP40 peptides were able to block viral attachment to the RD cells. The data demonstrated the potential of D-SP40 peptides as the antiviral agent against EV-A71.

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