

A Novel Peptide Showing Universal Effect against Multiple Viruses in Vitro and in Vivo

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Abstract : Background: So far, there is no universal antiviral agent which can inhibit multiple viral infections. More and more drug-resistant viral strains emerge after the antiviral drug application for treatment. Defensins are the front line of host innate immunity and have broad spectrum antibacterial and antiviral effects. However, there is limited data to show if these defensins have good antiviral activity in vivo and what the antiviral mechanism is. Subjects: To investigate a peptide with widespread antiviral activity in vitro and in vivo and illustrate the antiviral mechanism. Methods: Antiviral peptide library designed from mouse beta defensins was synthesized by the company. Recombinant beta defensin was obtained from E. coli. Antiviral activity in vitro was assayed by plaque assay, qPCR. Antiviral activity in vivo was detected by animal challenge with 2009 pandemic H1N1 influenza A virus. The antiviral mechanism was assayed by western blot, ELISA, and qPCR. Conclusions: We identify a new peptide which has widespread effects against multiple viruses (H1N1, H5N1, H7N9, MERS-CoV) in vitro and has efficient antiviral activity in vivo. This peptide inhibits viral entry into target cells and subsequently blocks viral replication. The in vivo study of the antiviral peptide against other viral infections and the investigation of its more detail antiviral mechanism are ongoing.

Keywords : antiviral peptide, defensin, Influenza A virus, mechanism

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