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Design, modification and *in vivo* antiviral activity of relatively broad-spectrum fusion inhibitory peptide

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Abstract

A series of peptides have been developed based on the discovery of molecular mechanisms of the membrane fusion of envelope viruses from three different families. These newly designed peptides can completely inhibit single virus infections and co-infections which severely threaten the poultry industry and even human health. The peptides' modified with cholesterol showed even more promising antiviral activities when tested in animal models. Cholesterol-tagged peptides were able to protect chicken embryos from infection when administered 12 h prior to virus inoculation. In comparison, the untagged peptides required intervention closer to the time of viral inoculation to achieve a similar level of protection. Intramuscular injection of peptide modification at 1.6 mg/kg 1 day before virus infection and then three times at 3-day intervals after viral inoculation protected 70% of the animals from NDV infection. Finally, we show that the cholesterol-tagged peptide could play a role before the viral fusion peptide's insertion into the host cell and thereby target an earlier stage of fusion glycoprotein activation. The work has substantially extended the limitations of current antiviral therapy drugs, which are almost pathogen-specific, and are of importance for the further development of antivirals with broad-spectrum protective effects.

Biography

Prof. Xiaojia Wang has completed her PhD in 2004 from China Agricultural University. Her research has focused on the molecular mechanisms of virus entry and identification of cellular defense proteins. Dr. Wang has published more than 20 archival papers in leading journals, such as *Journal of Virology*, *PNAS*, *Plos One*, and *Virology*. She was granted 3 domestic and international patents. This academic exchange is supported by the DBN Group of China Agricultural University Education Foundation.