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New approaches for developing viral vaccines against influenza and respiratory syncytial virus

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Respiratory syncytial virus (RSV) is one of the most important causes for viral lower respiratory tract disease in humans. There is no licensed RSV vaccine. Here, we generated recombinant influenza viruses carrying the chimeric constructs of hemagglutinin (HA) and central conserved-domains of the RSV G protein or RSV F neutralizing epitopes. Chimeric recombinant influenza viruses showed lower pathogenicity without compromising immunogenicity in mice. Single intranasal inoculation of mice induced RSV neutralizing activity. Mice with single intranasal inoculation of chimeric recombinant influenza viruseswere protected against RSV infection as evidenced by significant reduction of lung viral loads upon RSV challenge. Chimeric recombinant influenza virus inoculation of mice did not induce pulmonary eosinophilia and inflammationupon RSV infection. To improve cross protection overcoming HA specific immunity, we engineered replication-competent influenza A virus to express tandem repeat of heterologous M2 extracellular (M2e) domains in a chimeric HA conjugate form.Immune sera from mice with inoculation of live recombinant influenza virus expressing M2e4x-HA were effective in conferring cross protection against H1, H3, and H5 subtype influenza viruses. These findings support a concept that chimeric recombinant influenza viruses carrying the RSV neutralizing or influenza conserved-domain can be developed into new viral vaccines against RSV or influenza virus.

Biography

Sang-Moo Kang has completed his PhD in 1998 from the University of Alabama at Birmingham, and Postdoctoral studies from Emory University School of Medicine. He is the Professor at the Institute for Biomedical Sciences, Georgia State University. He has published more than 120 papers in reputed journals in the fields on novel viral vaccines and immunology of vaccines and adjuvants.

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