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2009 H1N1 pandemic influenza virus-like particle vaccine efficacy

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A 2009 H1N1 pandemic influenza virus-like particles (VLPs) vaccine containing HA and M1 proteins derived from the A/California/04/2009 virus was generated. The VLP vaccine efficacy was investigated for efficacy against homologous, heterogous and heterosubtypic influenza viruses in mice. A single intramuscular vaccination provided complete protection against homologous A/California/04/2009 viruses with no virus detected in lungs. For cross protective efficacy against antigenically distant H1N1 viruses, intramuscularly immunized mice were challenged with lethal dose of A/PR8/34 or A/Caledonia/99 viruses after a 2nd boost. Mice showed 100% protection against both viruses. Better cross protection against A/PR8/34 virus than A/Caledonia/20/99 was characterized by lower lung virus titers, less body weight loss, and higher cross reactive recall IgG antibody secreting cell responses. For heterosubtypic immunity, intranasally immunized mice were challenged with lethal doses of H3N2 viruses. Mice showed 100% survival with 10% to 16% body weight losses respectively against A/Philippine/82 or A/Hong Kong/68 challenge, whereas all naive control mice died. Mice showed higher cross reactive lung IgG and IgA responses after H3N2 virus challenges. These results indicate that VLPs can be developed as an effective vaccine which can confer protection against homologous, heterogous and heterosubtypic influenza viruses.

Biography

Fu Shi Quan received her Ph.D. degree at Korea University Seoul, Korea and had postdoctoral training in the laboratory of Professor Richard W. Compans (Department of Microbiology & Immunology, School of Medicine, Emory University, GA, USA). She has spent most of her scientific career in Dr. Compans' lab studying virus-like particle vaccines. Currently, she is a Professor at Kyung Hee University School of Medicine, where her focus is the development of VLP protective vaccines against influenza and a respiratory syncytial virus (RSV). She is recognized as an expert in influenza VLP vaccine research and the development of related mouse models.

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