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# Development of vero cell-based influenza H5N1 vaccines

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## Abstract

Current egg-based influenza vaccine production technology is labor-intensive and lack of flexibility. Moreover, its capacity would not be able to meet the demand during influenza pandemics. This was illustrated in the 2009 H1N1 pandemic where only 22% of expected doses were supplied within the first 6 months after the pandemic was declared. Therefore, cell-based technology is becoming attractive for production of pandemic influenza vaccines. Two cell lines, MDCK and Vero cells are currently used for manufacturing human influenza vaccines. MDCK cells can only be used for manufacturing influenza vaccines. In contrast, Vero cells have been widely used for the production of human vaccines. The current WHO-recommended influenza H5N1 clade-1 vaccine strain (NIBRG-14), a reassortant virus between A/Vietnam/1194/2004 (H5N1) virus and egg-adapted high-growth A/PR/8/1934 virus, could grow efficiently in eggs and MDCK cells but not Vero cells. Therefore, we first adapted the egg-derived NIBRG-14 in Vero cells to become a Vero cell-adapted high-growth H5N1 vaccine virus (Vero-15), which could reach high virus titer (>$10^8$ TCID50/ml) in Vero cells in multiple culture systems including T flasks, mirocarriers and TideCell cultures. Then, we established reverse genetics platform to generate high-growth reassortant H5N1 clade-2 viruses using the Vero-15 virus as a master donor virus. In conclusion, the Vero-15 H5N1 vaccine virus has the commercial potential to become a seed virus for manufacturing H5N1 vaccines. In addition, the Vero-15 H5N1 vaccine virus could become a mater donor virus to generate seed viruses for other influenza A subtypes

## Biography

Dr Min-Shi Lee obtained his PhD from Oxford University. He joined National Health Research Institutes as an associate investigator in 2005. Before that, he was epidemiologist and scientist at MedImmune Vaccines, California, USA. Dr Lee has won numerous awards, including National Innovation Award from Institute for Biotechnology and Medicine Industry and Outstanding Young Investigators Research Award from National Health Research Institute. Dr Lee's research interests include epidemiology of infectious diseases and development of influenza and enterovirus 71 vaccines. He has coauthored over 40 original research articles and technology reports. Besides, he is a reviewer for several international journals.