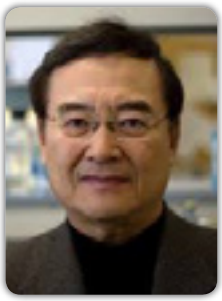


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## Matrix protein gene variants of two serotypes of vesicular stomatitis virus are ideal viral vectors for prime-boost therapeutic HIV vaccines


There have been numerous attempts to develop therapeutic vaccines to clear virus-infected cells by activating viral protein-specific cytotoxic T lymphocytes using many different recombinant viral vectors. The vesicular stomatitis virus (VSV), one of the rhabdoviruses, offers an ideal system for prime-boost vaccine vectors. In order to induce the maximum immune responses, the priming recombinant viral vector should be antigenically distinct from the boosting vector to maximize the boost effect since a priming vaccine vector will induce neutralizing antibodies which will neutralize the boosting vaccine vector should one uses the same vector for the prime-boost vaccinations. Here, we report robust T-cell immune responses and humoral immune responses when two antigenically distinct genetically modified VSV vectors are used for prime-boost immunization. To examine the $CD8^+$ T cell and B cell adaptive immune responses against the proteins expressed from the genetically modified *M* gene variants of rVSV vectors, we generated rVSVs with HIV-1 *gag*, *env* and *pol* genes. From the various vaccination regimens tested in animals, priming with $rVSV_{Ind}$(GML)-*gag*, $rVSV_{Ind}$(GML)-*pol*, and $rVSV_{Ind}$(GML)-*env* followed with $rVSV_{NJ}$(GMM)-*gag*, rVSVNJ(GMM)-pol, and rVSVNJ(GMM)-env boosting induced the strongest $CD8^+$ cytotoxic T cell immune responses against the HIV-1 Gag, Pol, and Env proteins. The same vaccination regimen also induced strong humoral immune responses against the HIV-1 Gag protein and Env protein. Increasing vaccine doses up to $10^9$ PFU induced stronger humoral immune responses against the HIV-1 Gag protein and Env protein. Our results demonstrated that $rVSV_{Ind}$(GML) priming following with $rVSV_{NJ}$(GMM) boosting is the best for optimum adaptive $CD8^+$ T cell as well as humoral immune responses. Our results showed that genetically modified dual serotype VSV vectors with HIV gene inserts are safe and highly efficient in inducing robust adaptive immune responses. This rVSV-HIV vaccine is an excellent candidate as therapeutic vaccine to treat HIV-positive patients.


### Speaker Biography

C Yong Kang, PhD, DSc, FRSC, is a Molecular Virologist and Professor of Virology in the Department of Microbiology and Immunology, Schulich School of Medicine and Dentistry at the University of Western Ontario in Canada (1992-Present). He carried out his Postgraduate studies at McMaster University where he received a PhD in Virology under the supervision of Professor Ludvik Prevec (1968-1971) and his Post-doctoral training under Professor Howard Temin at the University of Wisconsin-Madison (1971-1974). He went on to serve as a Professor of Virology in the Department of Microbiology at the University of Texas, Southwestern Medical School in Dallas, Texas (1974-1982), Professor and Chairman of the Department of Microbiology and Immunology at the University of Ottawa, Faculty of Medicine (1982-1992), and Dean of Science at the University of Western Ontario (1992-1999). He has received numerous prizes such as the Award of Excellence of the University of Ottawa (1991), Gold Medal for Ilchun Lecture (1998), Ho-Am Prize in Medicine (1999), the Order of Korea in Science and Technology (2002), the McMaster University Distinguished Alumni Award for 2007, the Lifetime Achievement Award from University of Western Ontario (2009), the Queen Elizabeth II Diamond Jubilee Medal (2012), selected as a Korean-Canadian Diaspora to Canadian Society by Canadian Government (2013) and the Scientist of the Year Award from the Korean Federation of Science and Technology (2013). Dr. Kang was elected as a Life-time Fellow of the Royal Society of Canada Academy of Science (1993) and an elected Life-time Member of the Korean Academy of Science and Technology (1997). He continues to serve as a Grant Selection Committee Member for various federal granting agencies in Canada and the United States. He is a member of the Board of Directors of numerous research institutions and foundations. He also serves as a Reviewer for the *Journal of Virology, Journal of Infectious Diseases, Virus Research, Virology, Journal of Biological Chemistry, Journal of Human Virology and Retrovirology, and Canadian Medical Association Journal.*

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