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Development of the *Ebola virus* vaccine using a genetically modified dual serotype recombinant vesicular stomatitis virus platform technology

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The *Ebola virus* outbreak in West Africa continues to rage, with over 20,000 virus-infected individuals in 2014, over 50% which have resulted in death. The best and most effective way of controlling this devastating epidemic is to develop an efficacious vaccine. We have developed an *Ebola virus* vaccine using a genetically modified dual serotype recombinant vesicular stomatitis virus (VSV) platform technology. The VSV, one of the Rhabdo viruses, offers an ideal system for the creation of prime-boost vaccine vectors. In order to induce maximum immune responses, the priming recombinant viral vector should be antigenically distinct from the boosting vaccine vector to maximize the boost effect. Here we report robust humoral immune responses when two antigenically distinct genetically modified VSV vectors carrying the *Ebola virus* genes are used for prime-boost immunization. To examine the humoral immune responses against the *Ebola virus* proteins expressed from the genetically modified *M* gene variants of rVSV vectors, we generated rVSVs with the Zaire strain of *Ebola virus* GP, VP40 and NP genes. rVSVs carrying the *Ebola virus* GP, VP40, NP genes express high levels of proteins, and the GP and VP40 co-expression forms virus-like particles (VLP) that are secreted from the infected cells. From the various vaccination regimens tested in animals, priming with rVSV_{Ind} (GML)-*Ebo*GP+*Ebo*VP40, followed by an rVSV_{NJ} (GMM)-*Ebo*GP+*Ebo*VP40 boosting, induced strong humoral immune responses against the *Ebola virus* GP and VP40 proteins. Increasing vaccine doses induced stronger humoral immune responses against the GP and VP40 proteins. Our results demonstrate that rVSV_{Ind} (GML) priming followed by rVSV_{NJ} (GMM) boosting is the best system for inducing optimum adaptive immune responses. We are in the process of determining the efficacy of this *Ebola virus* vaccine in a BSL4 laboratory.

Biography

C Yong Kang completed his PhD from McMaster University in Canada, and Post-doctoral training from the University of Wisconsin-Madison. He previously served as a Professor in the Department of Microbiology at the University of Texas Southwestern Medical School, Professor and Chairman of Department of Microbiology and Immunology at the University of Ottawa Faculty of Medicine, and Dean of Science at the University of Western Ontario. He has published 137 peer reviewed research papers and 151 scientific proceedings and abstracts. He holds nine international biotechnology patents. He received numerous prizes and awards including the Ho-Am Prize in Medicine and was elected as a life-time Fellow of the Royal Society of Canada Academy of Science and an elected life-time Member of the Korean Academy of Science and Technology. He serves as a reviewer for seven international journals in virology and in medicine.

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