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Kunjin replicon-based vaccine candidate against Ebola virus

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Recent unprecendented outbreak of *Ebola virus* (EBOV) in West Africa which reportedtly infected more than 27,000 people and killed more than 11,000 of them has prompted an urgent need for vaccine. Although a number of EBOV vaccine candidates have been developed and some of them are currently undergoing clinical trials, none of them have yet been approved. We have been developing EBOV vaccine candidate based on self-replicating RNA (replicon) of naturally attenuated strain of *West Nile virus*, Kunjin (KUN). As an antigent we use glycopprotein GP from EBOV Zaire strain. KUN-GP replicon RNA was packaged into virus-like particles (VLPs) by KUN structural proteins produced in a packaging cell line. D637L mutant of GP with enhanced shedding produced less cytopathicity than wt GP during VLP preparation and allowed generation of higher VLP titres. Two immunizations of guniea pigs with 5×10^6 KUN-GP VLPs using either wt GP or D637L mutant GP resulted in up to 85% protection against challenge with 200 LD_{50} of guinea pig-adapted EBOV. Further vaccine efficacy studies were performed in African green monkeys. Four anilams were vaccinated twice with 10^9 KUN-GP D637L VLPs with 4 week interval and 3 weeks after the second immunization they were challenged with 600 pfu of Zaire EBOV. Three animals were completely protected against EBOV challenge, while one vaccinated animal and the control animal died from infection. We suggest that KUN replicon VLPs encoding EBOV GP/D637L represent a viable EBOV vaccine candidate.

Biography

Alexander Khromykh has recieved his PhD from the Russian State Centre for Virology and Biotechnology and completed postdoctoral studies at the University of Ottawa. He is currently the Professor of Molecular Virology and the Deputy Director of the Australian Infectious Diseases Research Centre at the School of Chemistry and Molecular Biosciences, University of Queensland. He also holds Senior Research Fellowship from the National Health and Medical Research Council. He has published more than 100 papers in the leading virological and broader disciplinary journals and has been serving as an editorial board member of Journal of Virology and Journal of General Virology.

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