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Pre-clinical evaluation of the therapeutic application of a vaccine targeting the 12 protease cleavage sites

Ma Luo[1, 2], D Tang[1], J Pinto[3], M Nykoluk[1], P Lacap[1], J Tuff[1], E Shadabi, C Czarnecki, J Whitney[4], M Alonso[3], T Ball[1, 2], G Kobinger[1, 2], P Sandstrom[1, 2] and **F Plummer[1, 2]**

[1]National Microbiology Laboratory, Canada
[2]University of Manitoba, Canada
[3]University of Santiago de Compostela, Spain
[4]Harvard Medical School, USA

Effective therapeutic vaccines used in combination of ARV to treat HIV infected patients can reduce drug induced toxicity, help to re-constitute immune system and achieve a functional cure. We conducted a pilot study to test the therapeutic effect of a novel HIV vaccine targeting the 12 protease cleavage sites in combination of ARV. SIVmac251 infected rhesus monkeys were treated with a combination of FTC, PMPA and raltegravir for 49 days. Seven days after ARV initiation the monkeys in the treatment group received rVSVpcs (i.m.). Three additional therapeutic treatment with rVSVpcs (i.m.) and NANOpcs (i.m.) were carried out with 2 weeks intervals. ARV treatment (ART) was stopped after 49 days and plasma viral load and proviral load, CD4/CD8 counts, antibody and T-cell response to PCS peptides and non-PCS Gag and Env peptides were analyzed. ART suppressed viral load of all macaques, but only the viral load of 6 out of 11 macaques was suppressed to non-detectable level. However, even with the short duration of ART and incomplete viral load suppression, the immune responses to PCS peptides were generated after 4 therapeutic treatments. The CD4 counts of PCS vaccine treated macaques were significantly improved after 35 days and 49 days of ART (p=0.027 and 0.044), whereas there is no significant improvement in CD4 counts of monkeys only received ARV. Thus, an HIV vaccine targeting protease cleavage sites can be used together with ART to improve patient care and achieve a functional cure.

Biography

Ma Luo is an Adjunct Professor in Department of Medical Microbiology, University of Manitba and a Research Scientist at HIV Host Genetics, National HIV and Retrovirology Laboratory, National Microbiology Laboratory, Public Health Agency of Canada. She has received her MSc from Chinese University of Science and Technology, Beijing, China and PhD from University of Manitoba, Canada. The major focus of her research in the recent years has been on uncovering the mechanism of resistance and susceptibility to HIV-1, to understand the interplay between host genetics, including human leukocyte antigens, KIR and other host genetic factors with HIV virus and to use this knowledge to develop vaccines and therapeutics.

Ma.Luo@umanitoba.ca

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