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# Development of recombinant vaccine by individually cloning of HIV1 C gag, env and polRT genes using Semliki forest virus vector

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The development of a safe, immunogenic, globally effective and affordable vaccine may be useful in control of HIV/AIDS. The recombinant vaccines developed by cloning of HIV genes using different vectors have not been found to be effective due to poor or moderate immunogenicity and/or safety. Semliki Forest Virus (SFV), an alpha virus does not have pre-existing immunity, has cytoplasmic but not nuclear expression of heterologous proteins and non-pathogenic in humans. Therefore HIV1 Indian subtype C gag, env and polRT genes were individually cloned using SFV vector to generate recombinant SFV2gen replicon RNA constructs and subsequently generated recombinant SFV2gen viral like replicon particles (VRP) designated as rSFV2gen/gag VRP, rSFV2gen/env VRP, and rSFV2gen/polRT VRP by co-electroporation with Helper RNA.. In vitro studies demonstrated high levels of expression of respective HIV1 proteins and their localization in cytosol and not nucleus from all three recombinant constructs following infection of BHK-21 cells. The recombinant RNA constructs and VRPs individually and in combination of three constructs elicited significantly high cell mediated immune responses as detected by INF gamma and IL2 Assay and humoral immune responses in mice. VRPs have been found to be more immunogenic as compared to RNA constructs. Studies demonstrated that all three recombinant SFV2gen based vaccine constructs of Indian subtype C gag, env and polRT genes were highly immunogenic in the mice model and therefore promising candidate vaccine for control and management of HIV/AIDS.

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