Perspective
Volume 14:04, 2023

Journal of AIDS & Clinical Research

ISSN: 2155-6113 Open Access

Evaluation of an LSDV-vectored Vaccine for Heterologous Prime-boost HIV Immunisations

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Introduction

The quest for an effective HIV vaccine has been ongoing for decades, and despite significant progress in understanding the virus and developing prevention and treatment strategies, a prophylactic vaccine remains elusive. Heterologous prime-boost vaccination strategies, involving the use of different vaccine vectors for initial priming and subsequent boosting, have shown promise in inducing robust and durable immune responses. This article explores the evaluation of a novel approach: using Lumpy Skin Disease Virus (LSDV) as a vector for heterologous prime-boost HIV immunizations. HIV (Human Immunodeficiency Virus) is a complex and highly mutable virus that has defied conventional vaccine development strategies. The virus targets the immune system itself, particularly CD4+ T cells, which play a central role in coordinating the body's immune responses. Developing a vaccine that can stimulate a potent and broadly protective immune response against HIV has proven exceptionally challenging [1,2].

Description

To date, several vaccine candidates have been tested in clinical trials, but none have achieved the level of efficacy required for widespread use. One of the primary obstacles to HIV vaccine development is the virus's ability to rapidly mutate and evade the immune system. This necessitates the exploration of innovative approaches, such as heterologous prime-boost strategies. Heterologous prime-boost vaccination involves the use of different vaccine vectors for the initial priming and subsequent boosting of the immune response [3-5]. This approach aims to overcome some of the limitations associated with single-vector vaccines, such as inadequate immune responses or vector-specific immunity. Lumpy Skin Disease Virus (LSDV) is a double-stranded DNA virus belonging to the Capripoxvirus genus. While it primarily affects cattle, LSDV has been explored as a potential vector for vaccine delivery in humans due to its ability to carry foreign genes and stimulate strong immune responses [6].

Conclusion

The quest for an effective HIV vaccine has been one of the greatest challenges in modern medicine. Heterologous prime-boost strategies, involving the use of different vaccine vectors, offer a promising avenue for vaccine development. The use of Lumpy Skin Disease Virus (LSDV) as a vector for HIV immunizations represents an innovative approach with the potential to stimulate strong and broad immune responses against HIV. However, the evaluation of LSDV-vectored HIV vaccines is a complex and multifaceted process, involving preclinical and clinical studies to assess safety, immunogenicity, and efficacy. While this approach offers advantages, such as vector diversity and strong immunogenicity, it also presents challenges related to safety, regulatory approval, cost, and vaccine access.

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Received: 03 August, 2023, Manuscript No. jar-23-114970; **Editor Assigned:** 05 August, 2023, PreQC No. P-114970; **Reviewed:** 17 August, 2023, QC No. Q-114970; **Revised:** 22 August, 2023, Manuscript No. R-114970; **Published:** 29 August, 2023, DOI: 10.37421/2155-6113.2023.14.957

Acknowledgement

None.

Conflict of Interest

None.

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How to cite this article: Toerder, Mertr. "Evaluation of an LSDV-vectored Vaccine for Heterologous Prime-boost HIV Immunisations." *J AIDS Clin Res* 14 (2023): 957.