# Vectored Vaccine for Animal and Human Infections

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## Technology description

A novel virus-vectored VC2-EHV-1-gD vaccine was constructed using the live-attenuated HSV-1 VC2 vaccine strain. This vaccine stimulated strong humoral and cellular immune responses in mice and promising results in horses against EHV-1 infection. More research is being done to move onto human trials.

Vaccination remains the best option to combat EHV-1 infection and several different strategies of vaccination have been investigated and developed over the past decades. Herein, we report that the live-attenuated Herpes Simplex Virus Type-1 (HSV-1) VC2 vaccine strain, which has been shown to be unable to enter into neurons and establish latency in mice, can be utilized as a vector for the heterologous expression of the Equine Herpesvirus-1 (EHV-1) glycoprotein D(gD), and that intramuscular immunization of mice resulted in strong anti-viral humoral and cellular immune responses. The VC2-EHV-1-gD recombinant virus was constructed by inserting an EHV-1 gD expression cassette under the CMV immediate early promoter control into the VC2 vector in place of the HSV-1 thymidine kinase (UL23) gene. The vaccines were introduced into mice through intramuscular injection. Both VC2-EHV-1-gD and the Vetera commercially available vaccine produced neutralizing antibody, which was significantly higher in comparison to VC2 and mock-vaccinated animals ($p<0.01$ or $p<0.001$). Analysis of EHV-1 reactive IgG subtypes demonstrated that vaccination with the VC2-EHV-1-gD vaccine stimulated robust IgG1and IgG2a antibodies after three vaccinations ($p<0.001$). Interestingly, Vetera vaccinated mice produced significantly higher IgM than other groups before and after challenge ($p<0.01$ or $P<0.05$). Vaccination with VC2-EHV-1-gD stimulated strong cellular immune responses characterized by upregulation of both interferon and TNF positive CD4+ T and CD8+ T cells.Overall, the data suggest that the HSV-1 VC2 vaccine strain may be used as a viral vector forvaccination of horses, as well as potentially for other economically important animals.

## Application area

Treatment of Equine Herpesvirus (EHV-1)
Restored immunotherapy

## Advantages

Strong humoral and cellular immune responses.
Viral vector can be used as a platform to treat other economically important animals
Fewer veterinary visits and injections required in comparison to current inactive vaccines.

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