IL-2 as the adjuvant in FMD vaccine

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Overview of FMD

Foot-and-mouth disease (FMD) is a severe, highly contagious and economically devastating viral disease worldwide.
Overview of FMD vaccine

- Inactivated antigen vaccines have been available since the early 1900s.
Overview of FMD vaccine

Shortcomings of traditional vaccines for FMD:

• *First,* there are so many different strains of the FMD virus;

• *Second,* traditional vaccines involve live FMD virus;

• *Third,* traditional vaccines cannot differentiate infected from vaccinated animals.
Overview of FMD vaccine

• The need for better foot-and-mouth disease (FMD) vaccines is not new.
  • subunit vaccine
  • live vector vaccine
  • Nucleic acid vaccines
  • Novel attenuated vaccine
  • Synthetic peptide vaccine
Overview of FMD vaccine

• Humoral immune response was considered to be an important defence mechanism in FMD infection.

• In recent past, there has been an increasing evidence of the importance of T cell mediated immunity in FMD.
Overview of FMD vaccine

• In recent years, special attention has been paid to cytokines as FMD vaccine adjuvants.

• IFNα,β,γ;IL-2,IL-6,IL-9,IL-18,IL-15,TNFα,IL-1β
IL-2 is a very popular adjuvant

- IL-2 is one of the most widely used adjuvants for vaccination to stimulate the proliferation and activation of various immune effector cells such as T cells, NK cells, B cells, and macrophages.
IL-2 is a very popular adjuvant

- IL-2 enhanced the immunogenicity of the FMD DNA vaccine candidate.

H.-T. Wong et al. Vaccine, 2002
IL-2 is a very popular adjuvant

- IL-2 was able to enhance the specific immune response against FMD virus type O, A22 and Asia 1.

S. Yadav et al. Vaccine, 2005
IL-2 is a very popular adjuvant

IL-2 is important in many types of T effector cell differentiation.
• T follicular helper cells (Tfh), a new specialized subset of CD4+ helper T cells, providing help to B cells.
rAd5VP1 induced the secretion of IL-21 and the expression of Bcl-6 mRNA.

Can IL-2 as an adjuvant for FMD vaccine candidate promote the generation of T follicular helper cells?
summary

• IL-2 as an adjuvant for an adenovirus-vectored FMD vaccine candidate through the generation of Th1, Th2 as well as T follicular helper cells.
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Liao et al, Immunity, 2013