

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 can not 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.
- IFN α , β , γ ;IL-2,IL-6,IL-9,IL-18,IL-15,TNF α ,IL-1 β

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

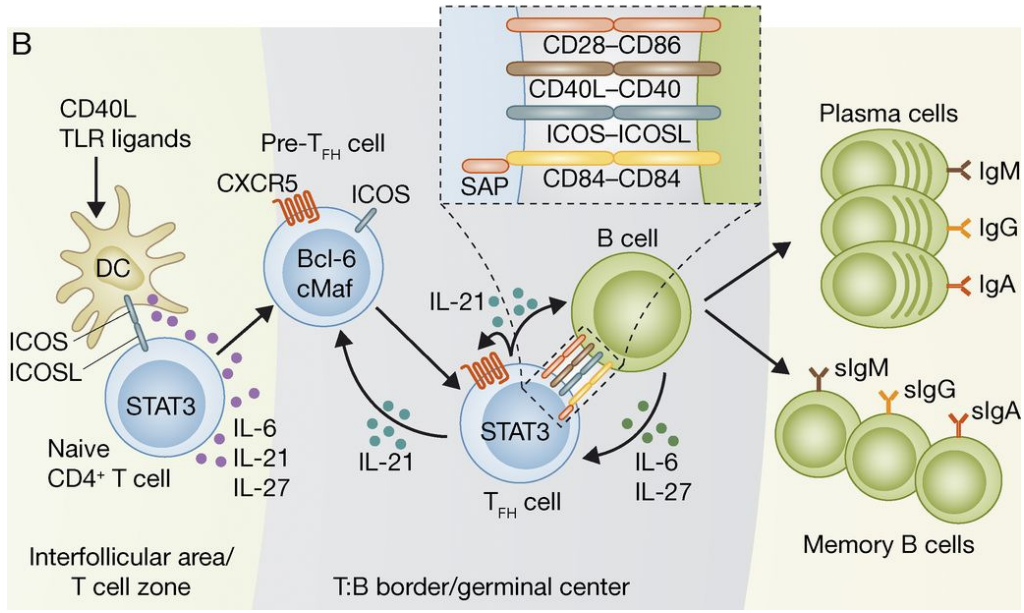
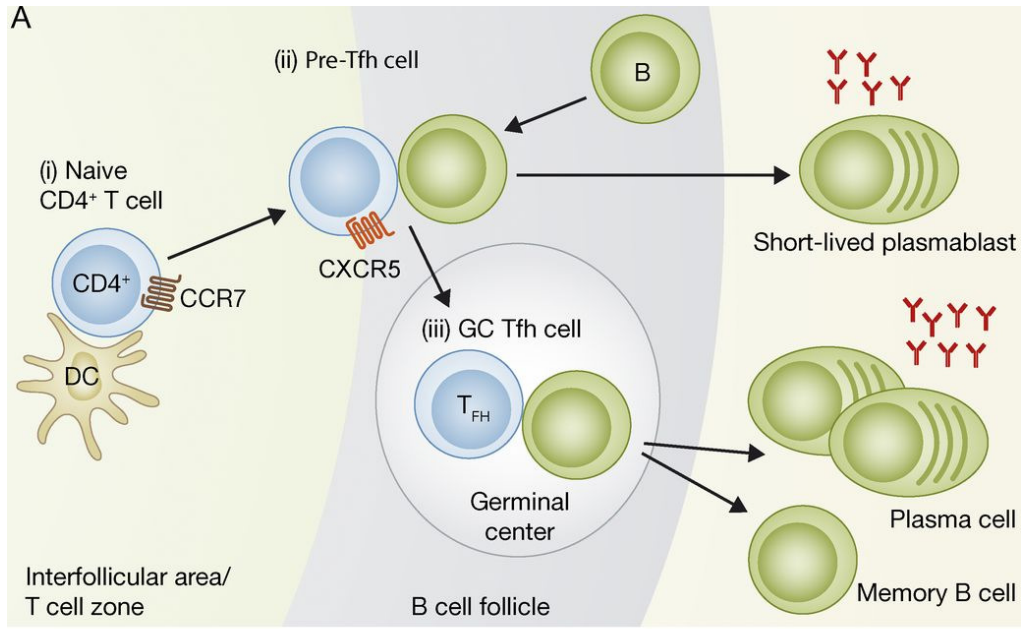
- IL-2 was able to enhance the specific immune response against FMD virus type O, A22 and Asia 1.

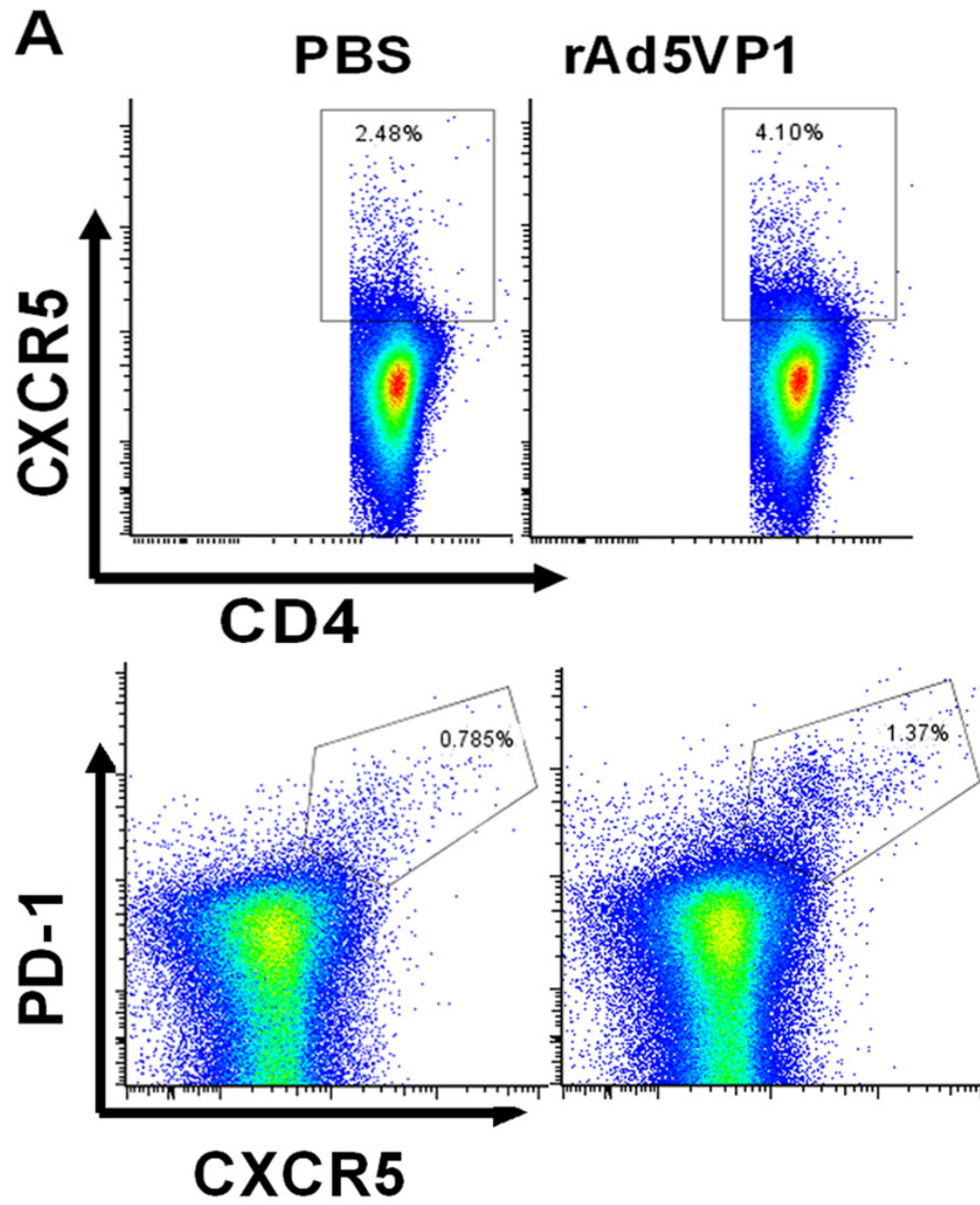
S. Yadav et al. Vaccine, 2005

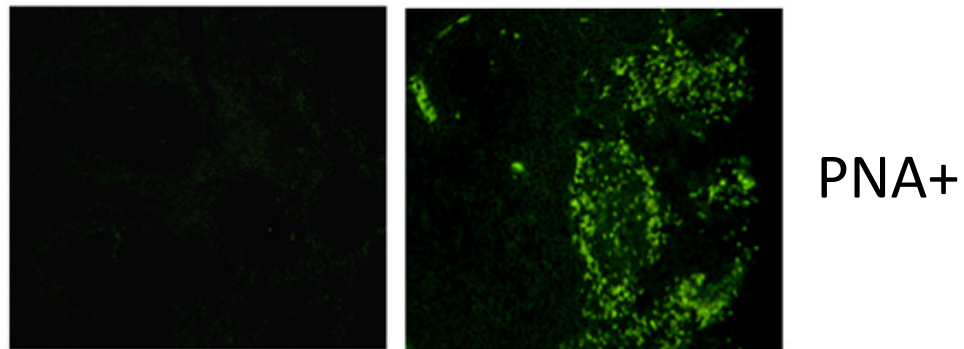
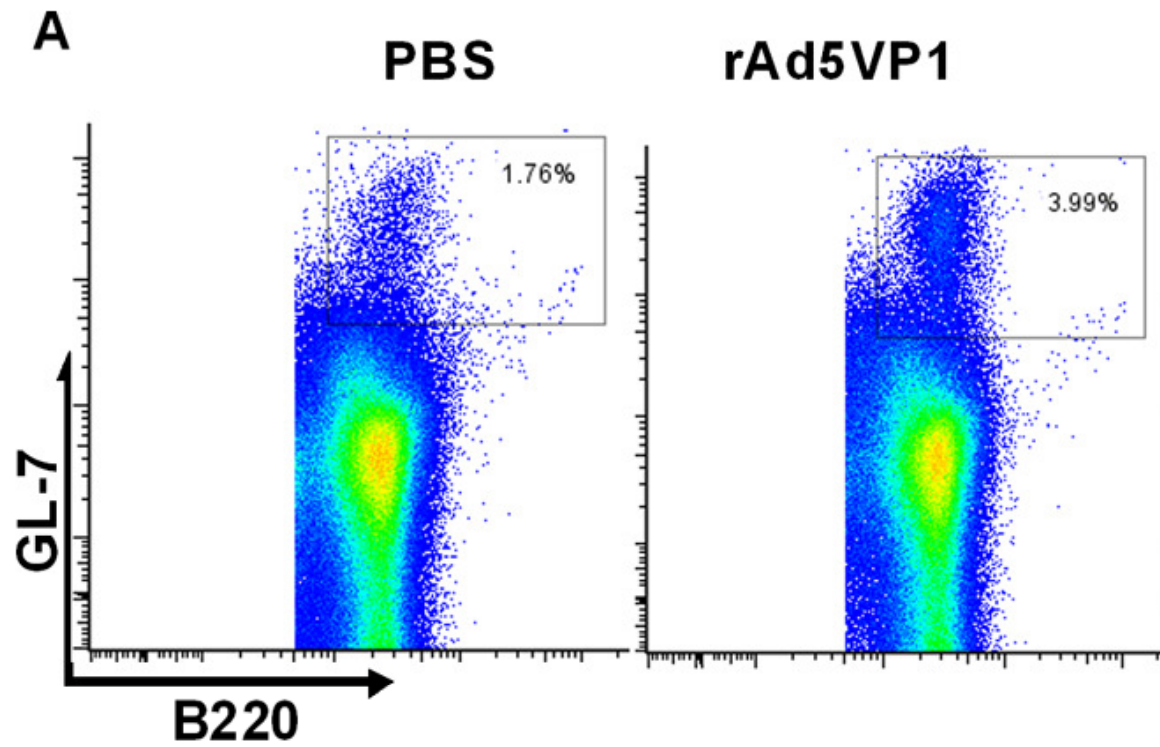
IL-2 is a very popular adjuvant

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.



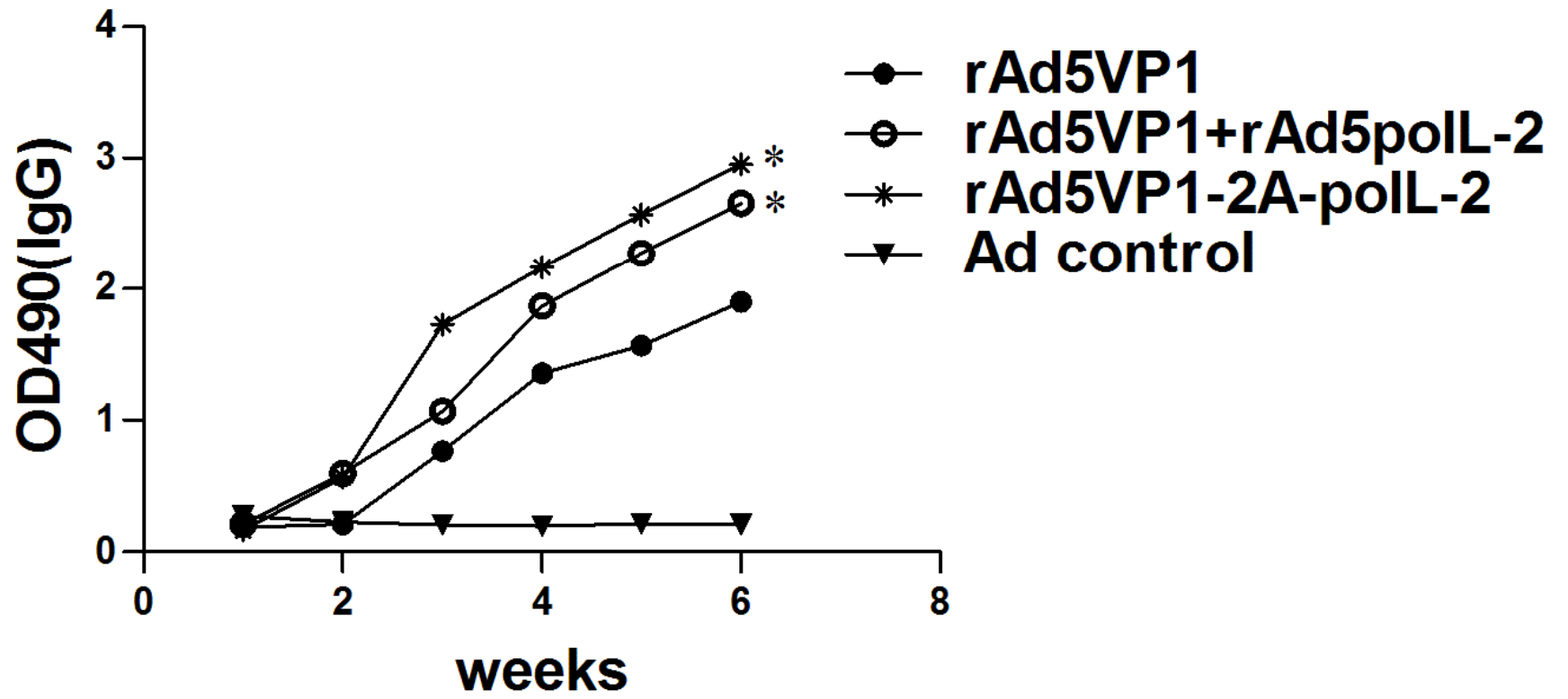


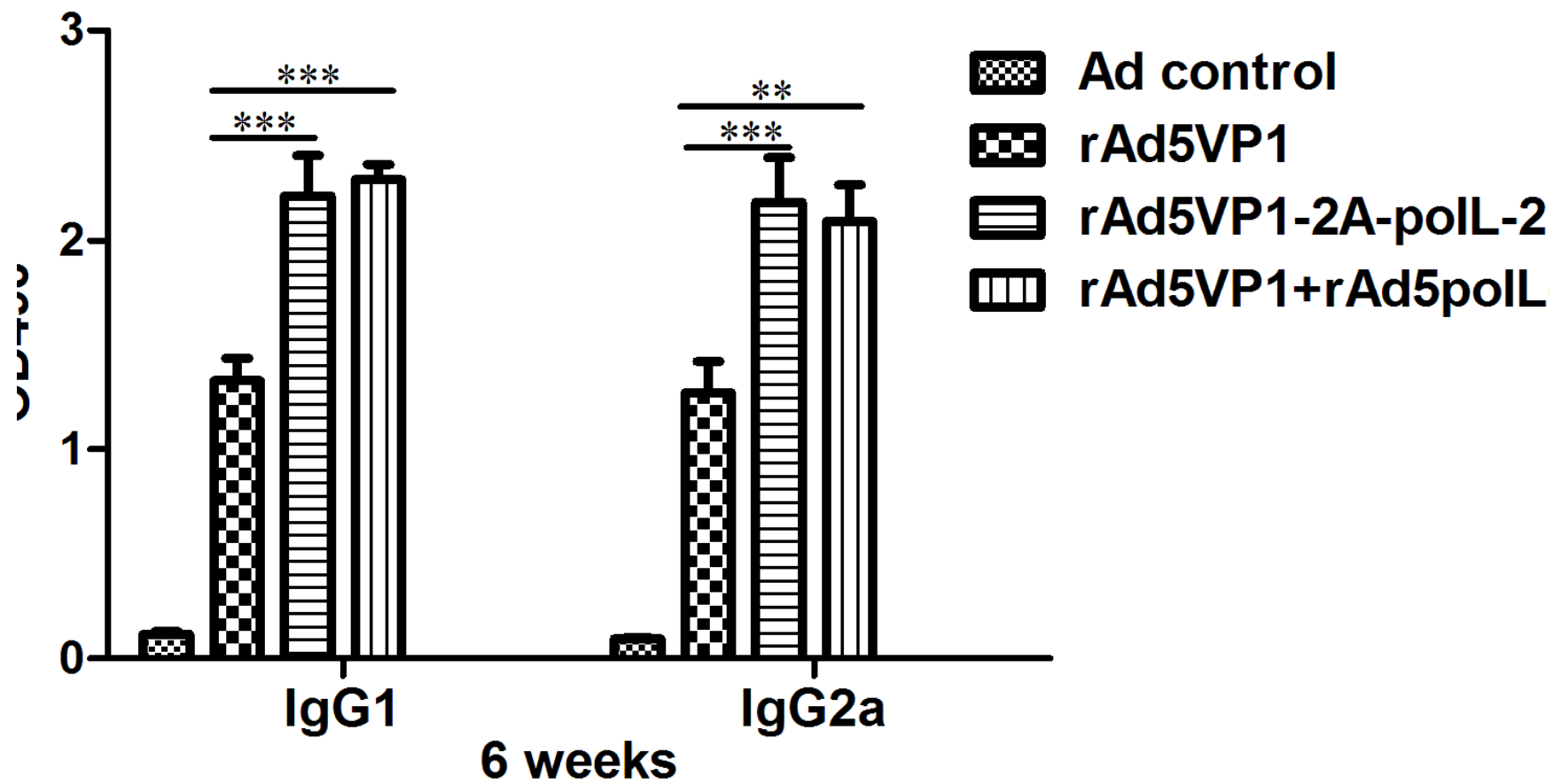


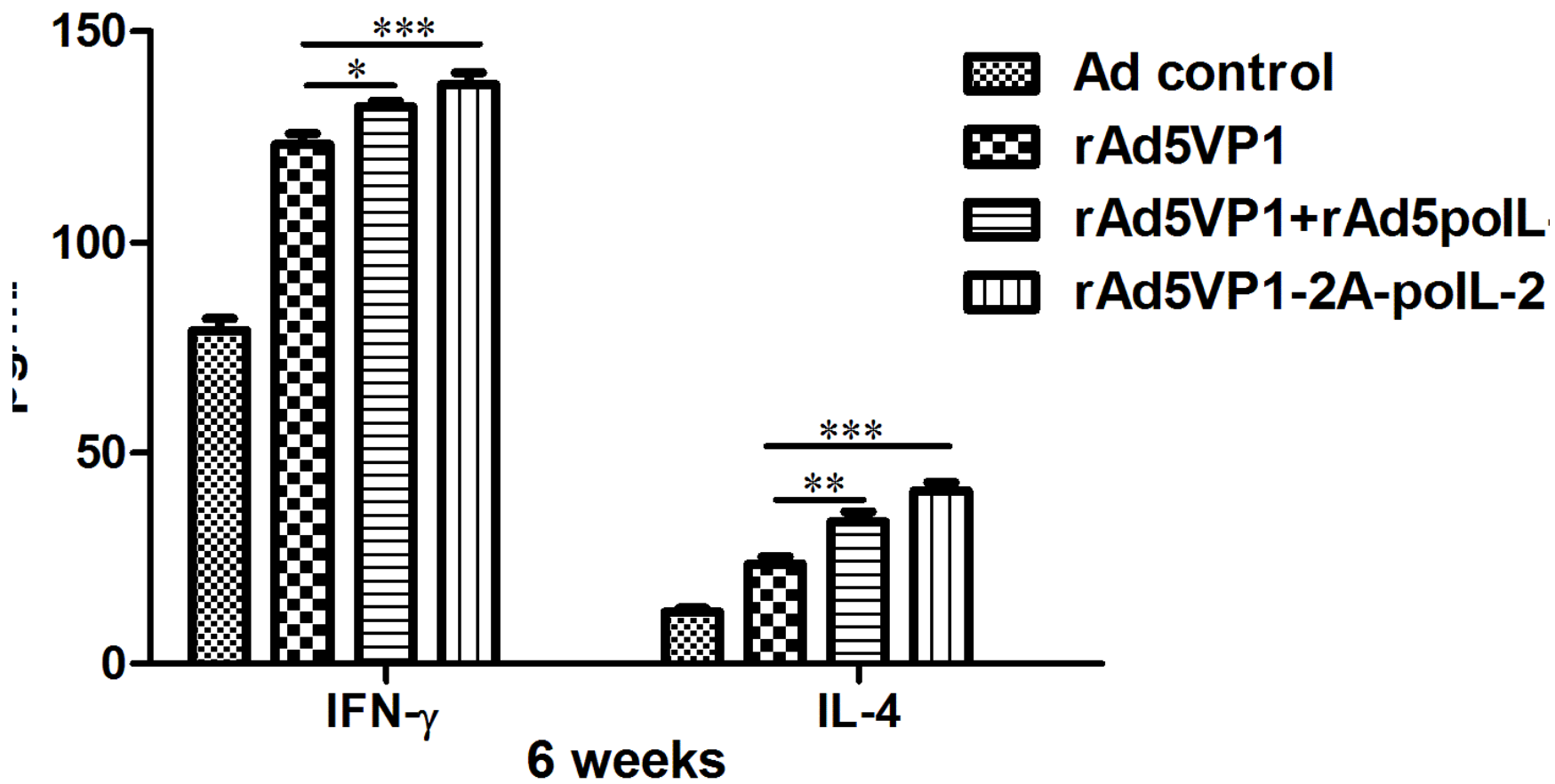
rAd5VP1 induced the secretion of IL-21 and the expression of Bcl-6 mRNA.

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

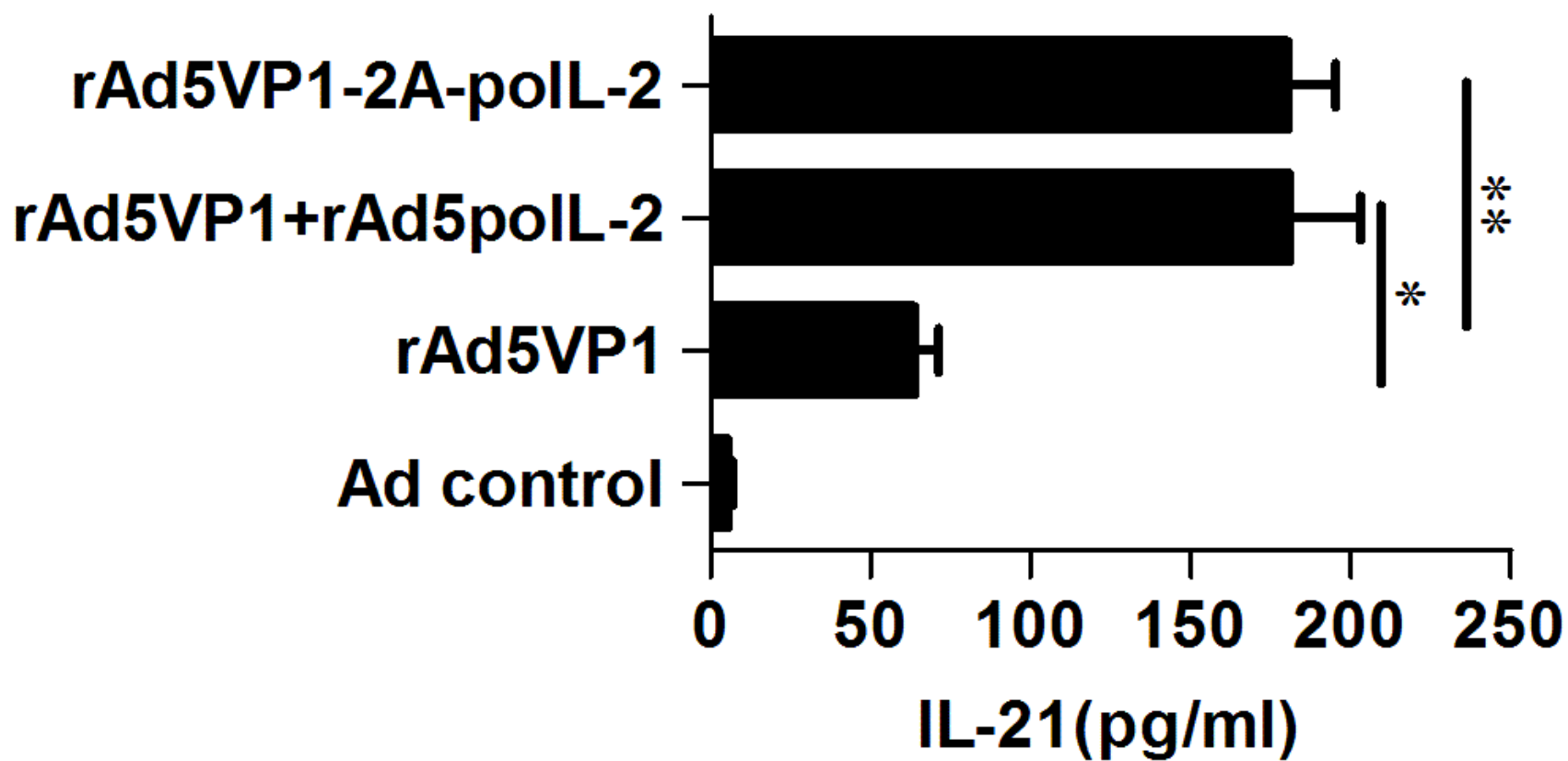
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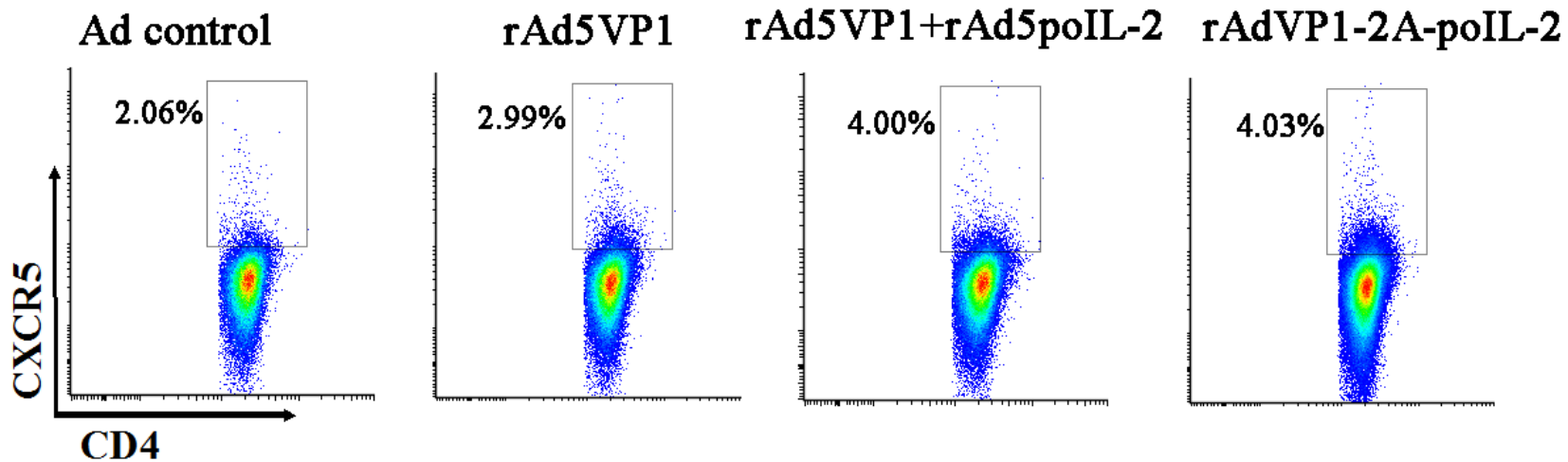
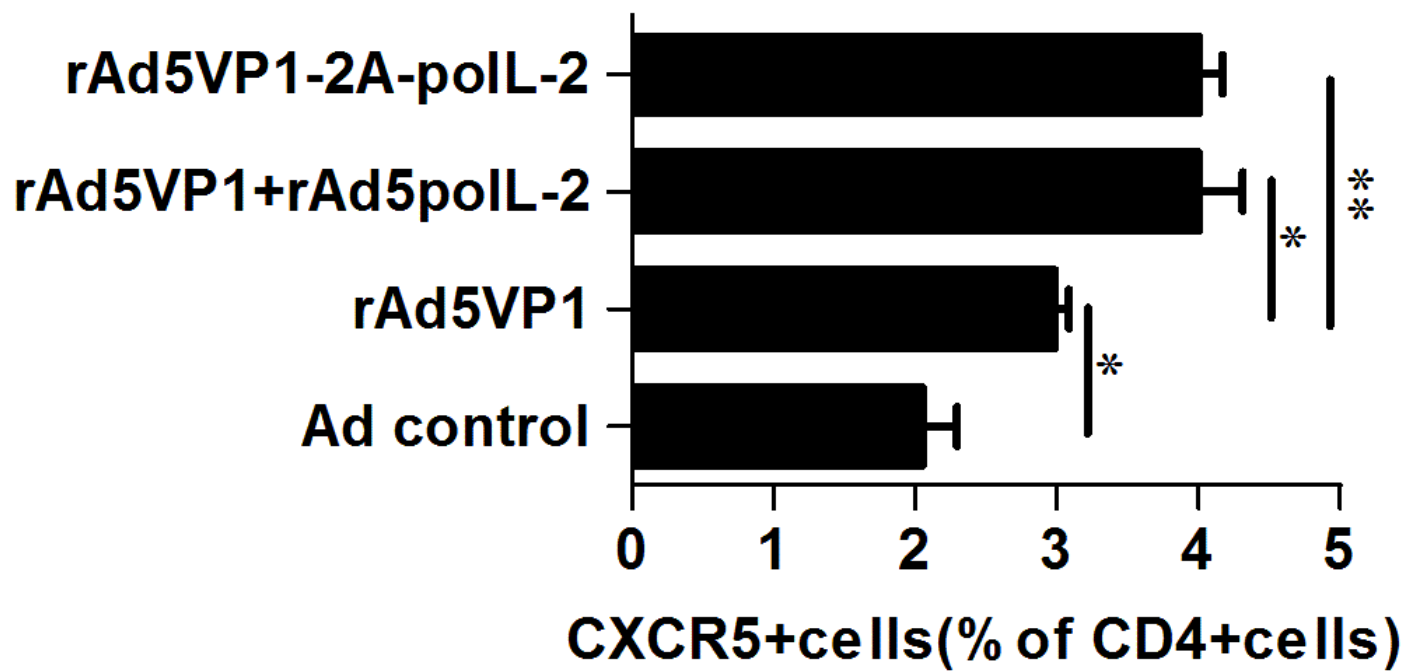


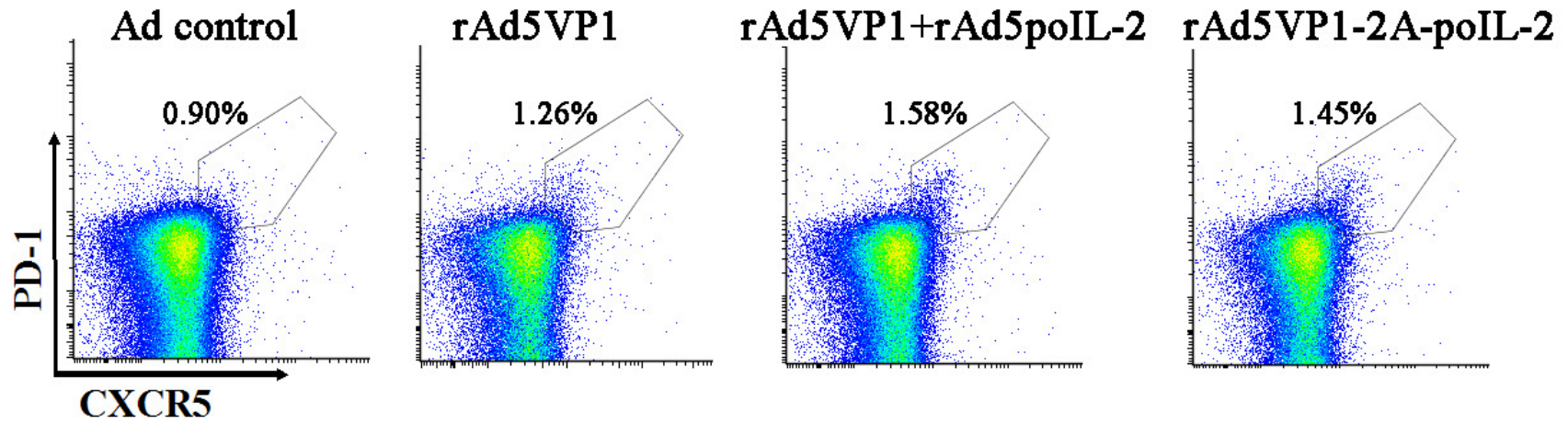
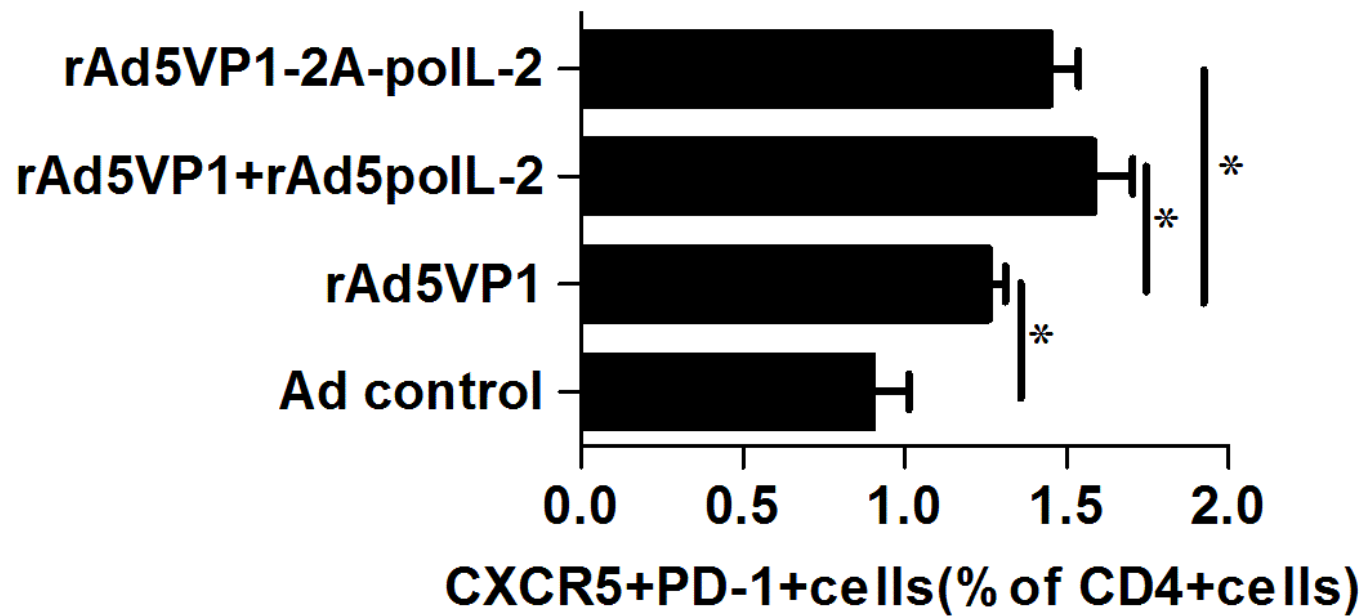


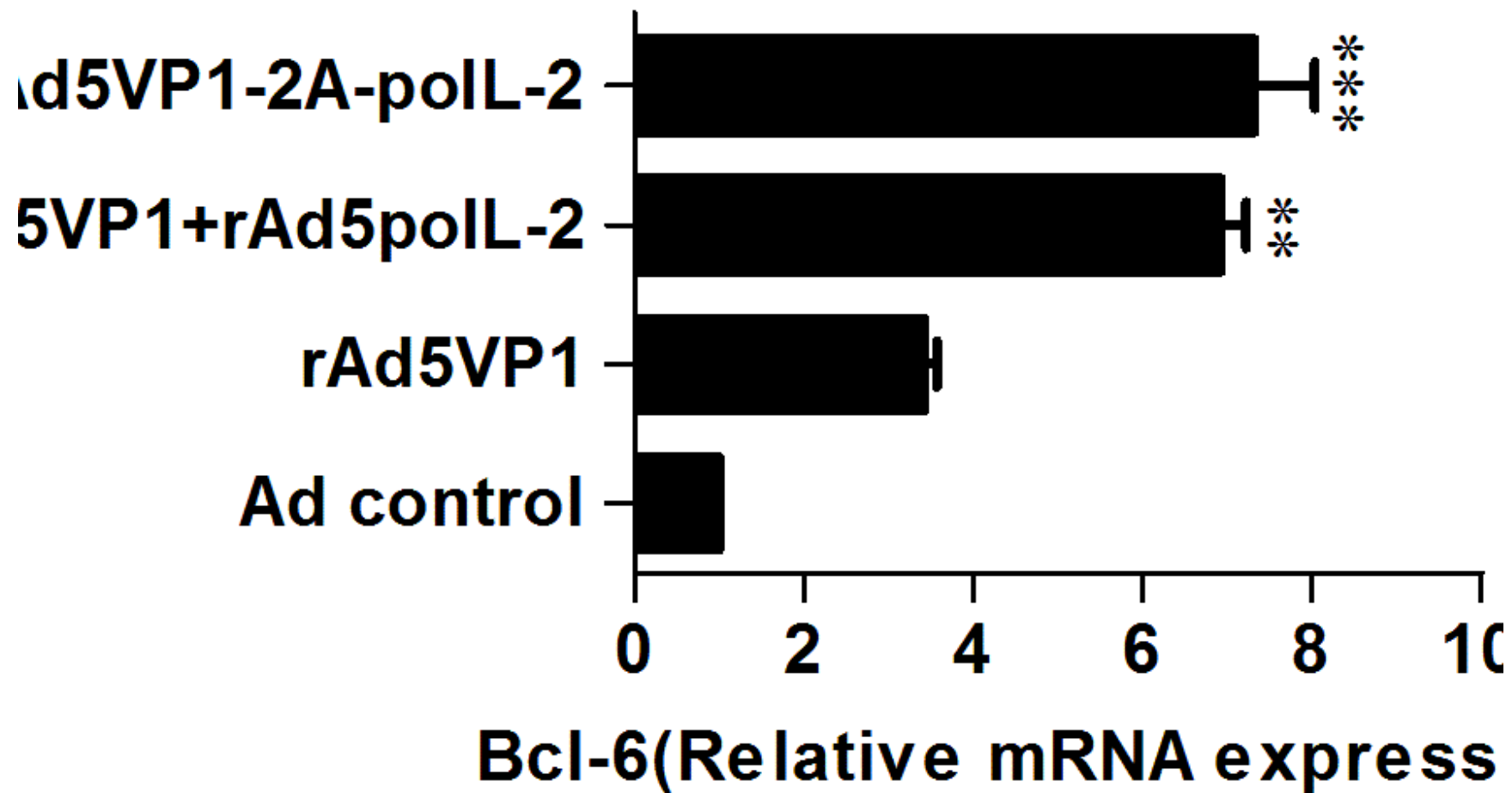


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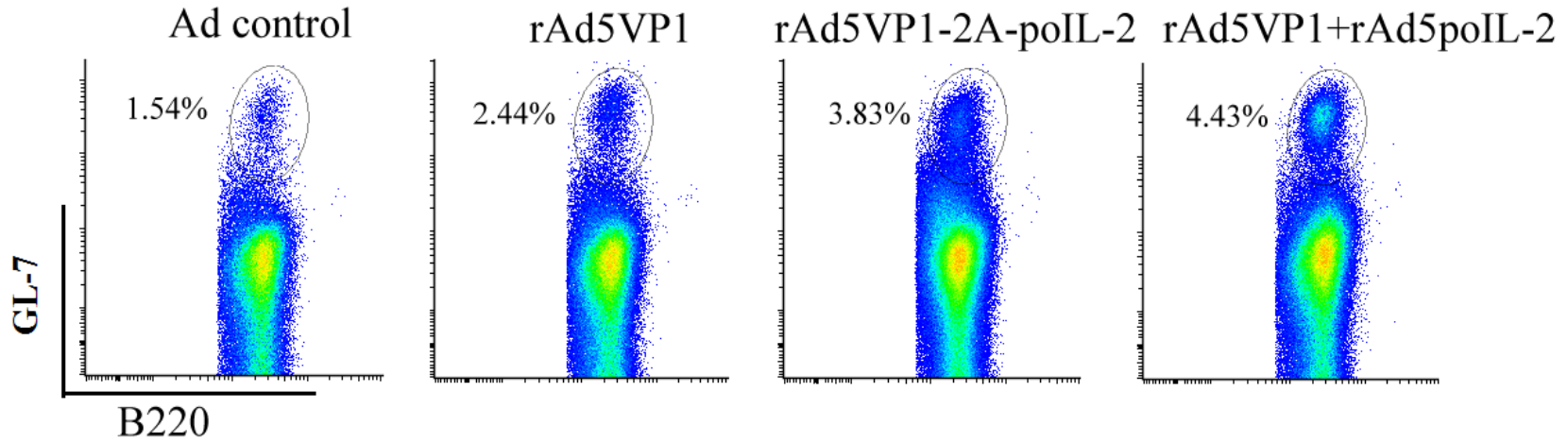


A**B**

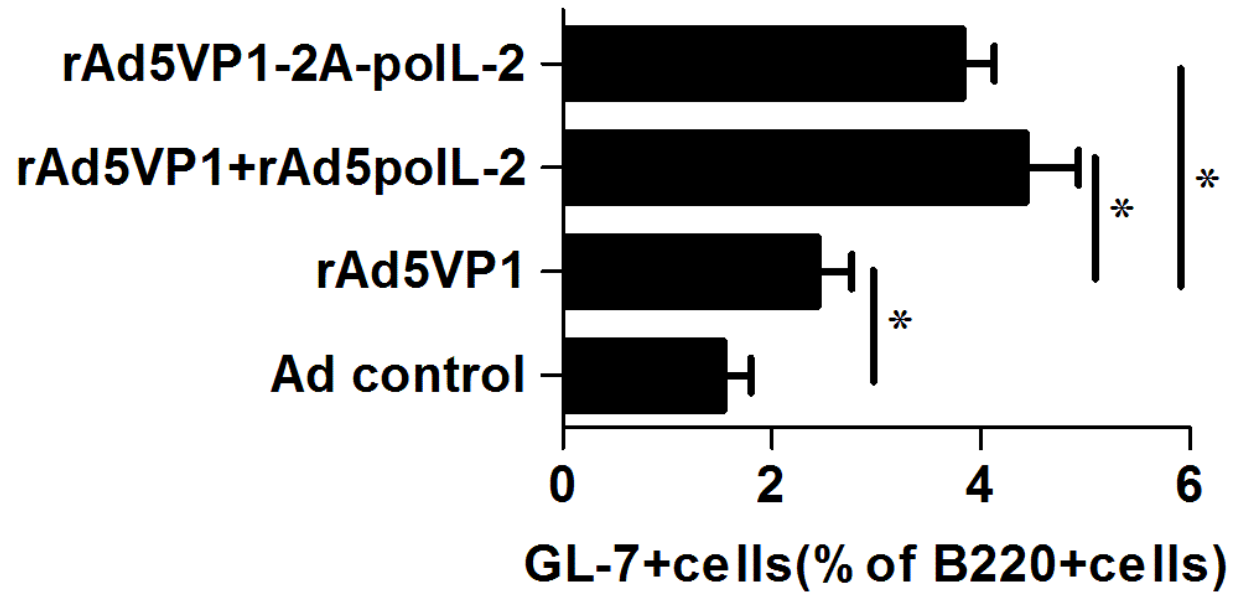
C**D**



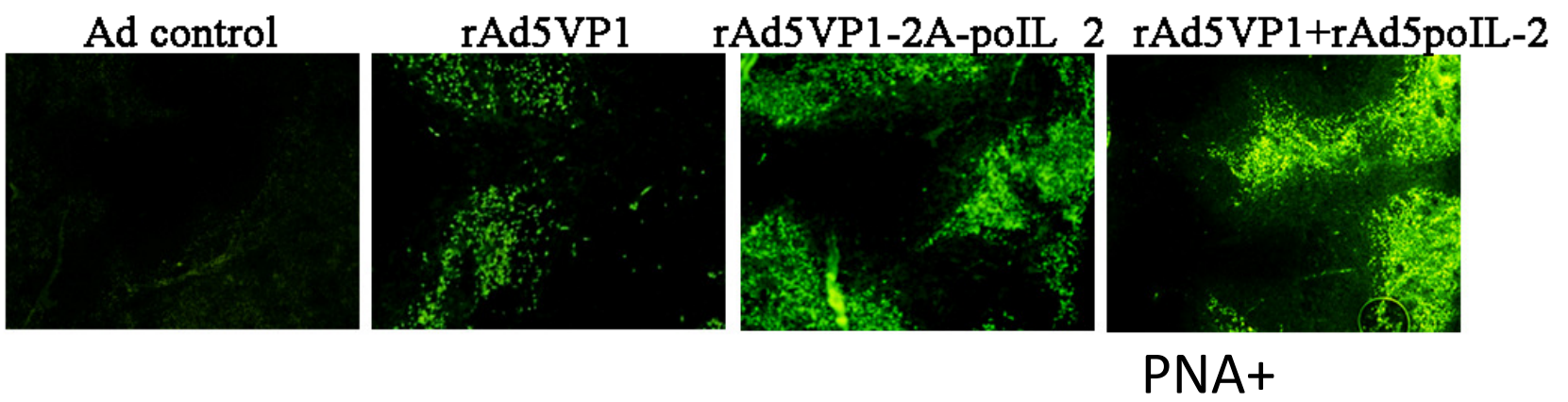
A



B



C



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.

acknowledgement

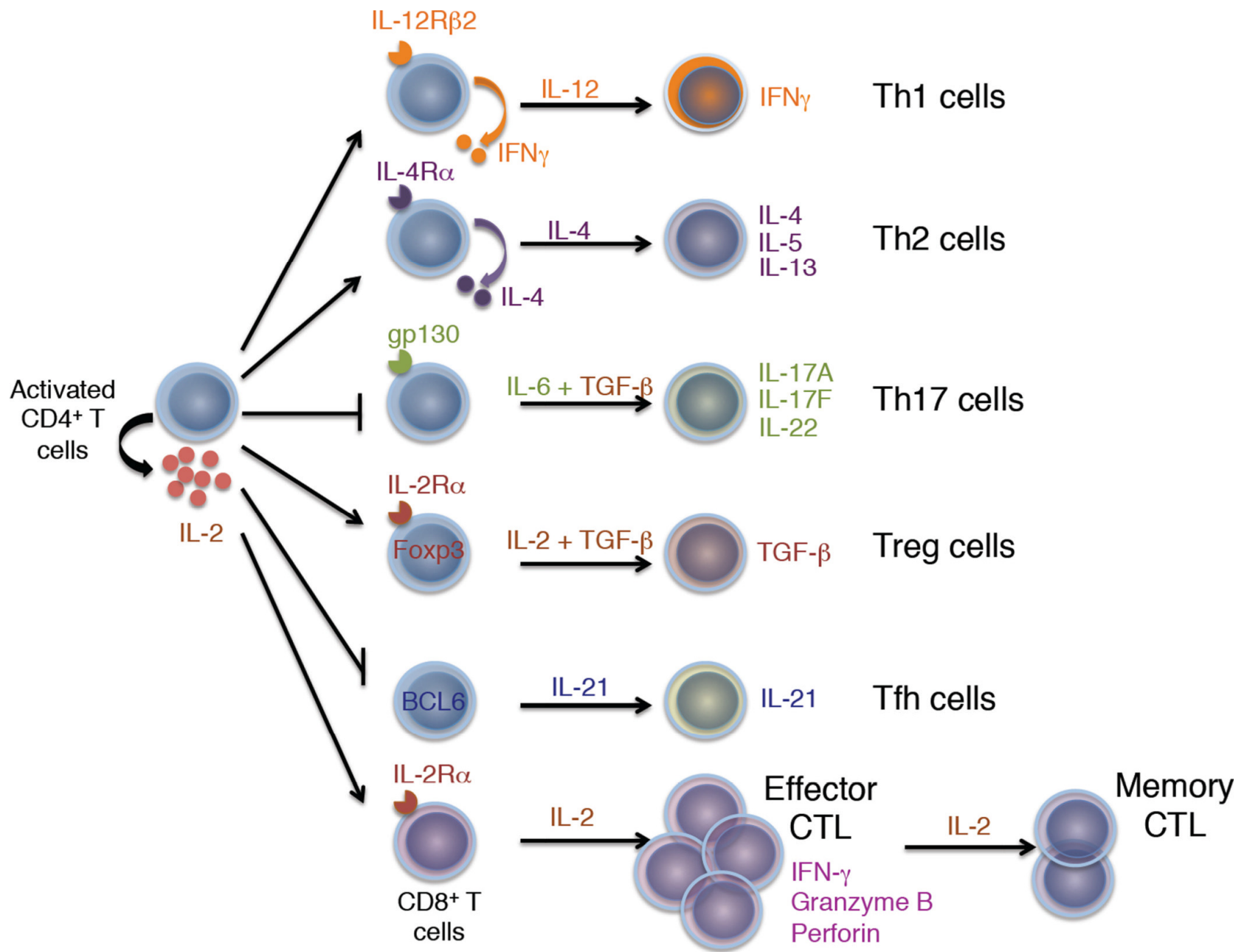
Xiangguo Duan, Ph.D.

Guanxian Xu, Ph.D.

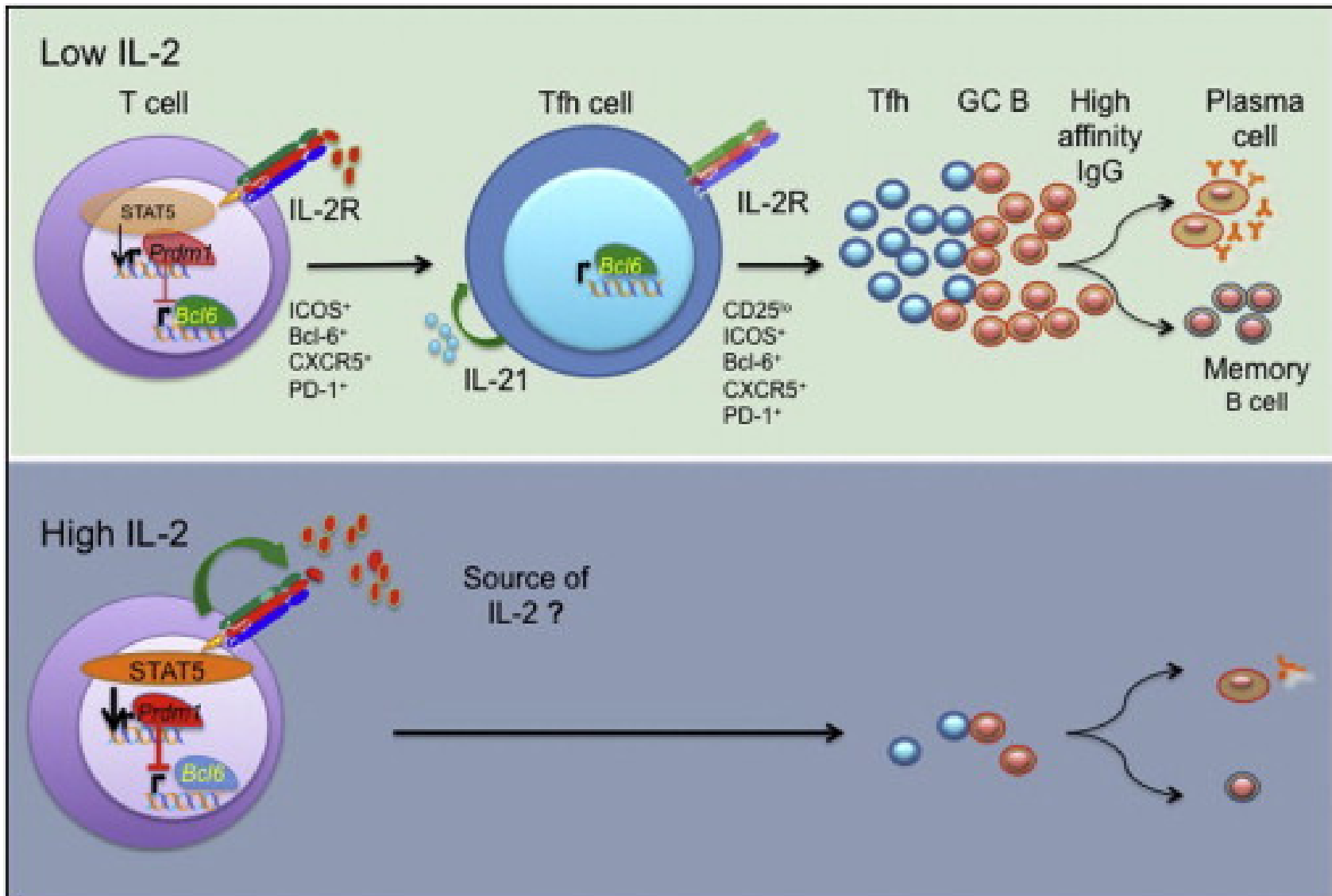
Jie Zheng, graduate student

Feng Wang, graduate student

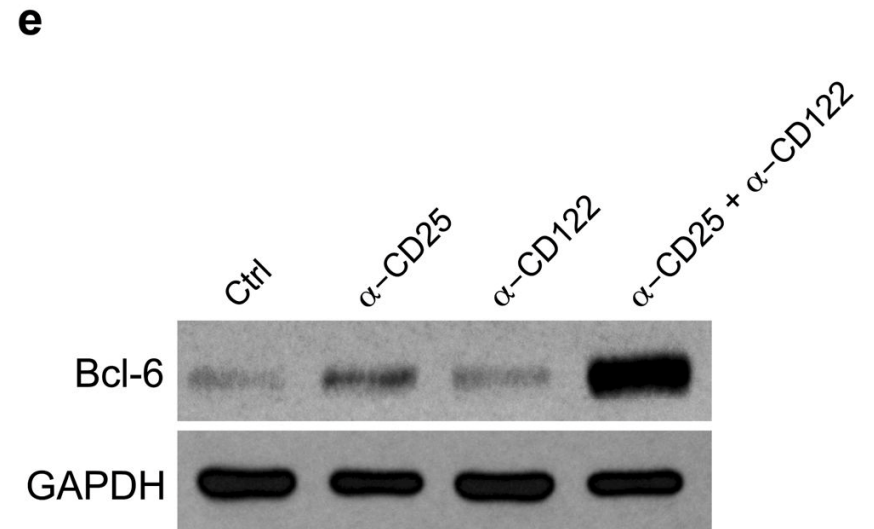
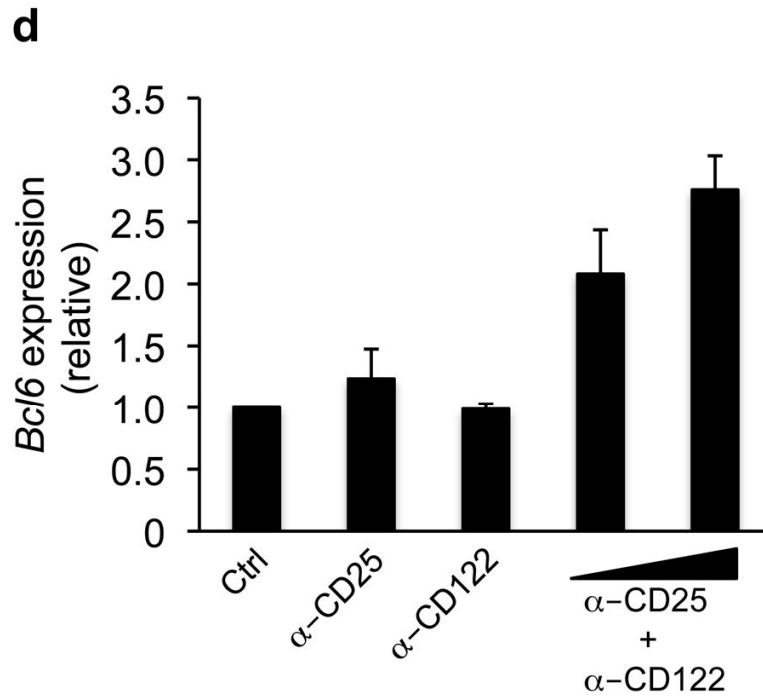
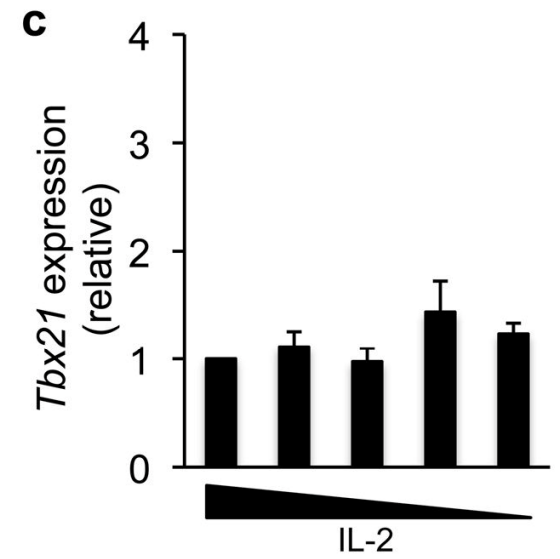
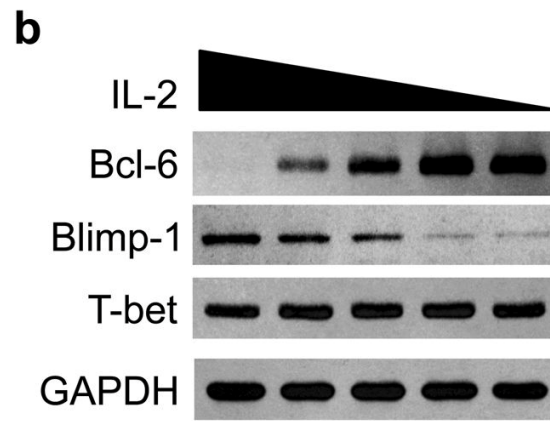
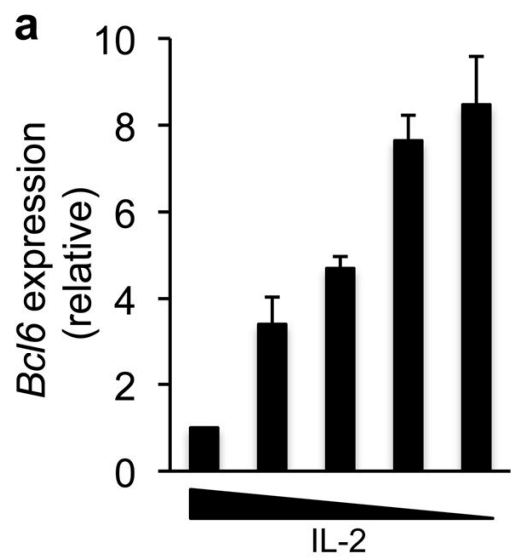
Thanks for your patient !



Liao et al, Immunity, 2013



Thomas R. Malek, Wasif N. Khan. Immunity 2012



Oestreich et al. Nat Immunol, 2013