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CD154 ELEVATING CELLULAR IMMUNITY BY UP-REGULATING THE PERCENTAGES OF ANTIGEN-SPECIFIC POSITIVE INTERFERON-GAMMA EXPRESSING CELLS

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Abstract

CD154 plays a central role in the development and regulation of adaptive immune responses in mammals and thus may act as a potential molecular adjuvant due to its enhancement of cytokine expression in immune cells. In this study, CD154-coding sequence was linked with the E2 antigen sequence of the Classical swine fever virus (CSFV) to produce an E2-CD154 vaccine and the specific pathogen free piglets at the age of 4-week old was used as an animal model. The CpG adjuvant, a Toll-like receptor 9 agonist, was used as a positive control. The animals were randomized into three groups and primarily vaccinated with E2-CD154, E2-CpG or the commercial Bayovac® E2 vaccines, respectively. All animals were boosted 2 weeks after primary vaccination. Results showed that the percentages of $CD3^+CD4^+$, $CD4^+IL2^+$ and $CD4^+IFN\gamma^+$ T cells in the peripheral blood mononuclear cells on 7-d (7 days) after primary vaccination were significantly enhanced in the E2-CD154 group as compared with the other two groups. Noteworthy, $CD8^+IL\text{-}2^+$ populations were increased on 21-d and $CD4^+IL2^+$ showed the highest expression on 28-d after booster in those of the E2-CD154 group. In addition, significantly increased E2-specific $IFN\gamma^+$ cells were found on 10-d and 14-d after the primary vaccination and 21-d and 28-d after booster in those of the E2-CD154 group. These results indicate that CD154 elevated T cells activities for producing high levels of IL-2 and IFN-γ. Thus, CD154 may act as a potential immunomodulatory adjuvant by increasing antigen-specific positive IFNγ-expressing cells.

Keywords:

CD154, Interferon Gamma, IL-2, Cellular Immunity, Peripheral Blood Mononuclear Cells