Improving the potency of DNA vaccine against Chicken Anemia Virus (CAV) by fusing VP1 protein of CAV to Marek's Disease Virus (MDV) Type-1 VP22 protein.

ABSTRACT

Studies have shown that the VP22 gene of Marek's Disease Virus type-1 (MDV-1) has the property of movement between cells from the original cell of expression into the neighboring cells. The ability to facilitate the spreading of the linked proteins was used to improve the potency of the constructed DNA vaccines against chicken anemia virus (CAV). The VP1 and VP2 genes of CAV isolate SMSC-1 were amplified and inserted into eukaryotic co-expression vector, pBudCE4.1 to construct pBudVP2-VP1. We also constructed pBudVP2-VP1/VP22 encoding CAV VP2 and the VP22 of MDV-1 linked to the CAV VP1. In vitro expression of the genes was confirmed by using RT- PCR, Western blot and indirect immunofluorescence. The vaccines were then tested in 2-week-old SPF chickens which were inoculated with the DNA plasmid constructs by the intramuscular route. After in vivo expression studies, immune responses of the immunized chickens were evaluated pre- and post-immunization. Chickens vaccinated with pBudVP2-VP1/VP22 exhibited a significant increase in antibody titers to CAV and also proliferation induction of splenocytes in comparison to the chickens vaccinated with pBudVP2-VP1. Furthermore, the pBudVP2-VP1/VP22-vaccinated group showed higher level of the Th1 cytokines IL-2 and IFN-g. This study showed that MDV-1 VP22 gene is capable of enhancing the potency of DNA vaccine against CAV when fused with the CAV VP1 gene.

Keyword: DNA vaccine; Chicken Anemia Virus (CAV); VP1 protein; Marek's Disease Virus (MDV); Type-1 VP22 protein.