

Functional ectodomain of the hemagglutinin-neuraminidase protein is expressed in transgenic tobacco cells as a candidate vaccine against Newcastle disease virus.

ABSTRACT

Recently, the use of plants for the production of recombinant proteins has been well demonstrated with promising outcomes. In this study, an efficient *Nicotiana tabacum* L. cv. Bright Yellow 2 (BY-2) cells system expressing the ectodomain of hemagglutinin-neuraminidase (eHN) protein from Newcastle disease virus (NDV) strain AF2240 was established. Transgenic tobacco BY-2 cell cultures expressing the immunogenic eHN protein were generated and the translation efficiency of eHN protein was enhanced using the 5'-untranslated region of *Nicotiana tabacum* alcohol dehydrogenase gene (NtADH 5'-UTR) under the control of strong cauliflower mosaic virus (CaMV 35S) promoter. Transgenic lines verified by real-time PCR showed high level of eHN mRNA transcripts and immunoblotting confirmed the presence of 66 kD eHN protein. The eHN protein was stably produced in an average of 0.2–0.4 % total soluble protein. Green fluorescent protein-tagged eHN protein was expressed and localized at the cytosol of BY-2 cell. All mice receiving purified eHN protein from transgenic tobacco BY-2 cells produced specific anti-NDV antibodies. We concluded that plant made eHN elicit immune response and can serve as candidate vaccine against NDV.

Keyword: Hemagglutinin-neuraminidase; Newcastle disease virus; NtADH 5'-UTR; Plant-based vaccine.