

## **Regression of solid breast tumours in mice by Newcastle disease virus is associated with production of apoptosis related-cytokines**

### **ABSTRACT**

Different strains of Newcastle disease virus (NDV) worldwide proved to have tumouricidal activity in several types of cancer cells. However, the possible anti-cancer activity of Malaysian NDV AF2240 strain and its mechanism of action remains unknown. The ability of cytokine-related apoptosis-inducing NDV AF2240 to treat breast cancer was investigated in the current study. Methods A total of 90 mice were used and divided into 15 groups, each group comprising of 6 mice. Tumour, body weight and mortality of the mice were determined throughout the experiment, to observe the effect of NDV and NDV + tamoxifen treatments on the mice. In addition, the toxic effect of the treatments was determined through liver function test. In order to elucidate the involvement of cytokine production induced by NDV, a total of six cytokines, i.e. IL-6, IFN- $\gamma$ , MCP-1, IL-10, IL12p70 and TNF- $\alpha$  were measured using cytometric bead array assay (plasma) and enzyme-linked immunosorbent spot (isolated splenocytes). Results The results demonstrated that 4 T1 breast cancer cells in allotransplanted mice treated with AF2240 showed a noticeable inhibition of tumour growth and induce apoptotic-related cytokines. Conclusions NDV AF2240 suppression of breast tumour growth is associated with induction of apoptotic-related cytokines. It would be important to further investigate the molecular mechanism underlying cytokines production by Newcastle disease virus. Electronic supplementary material The online version of this article (10.1186/s12885-019-5516-5) contains supplementary material, which is available to authorized users.

**Keyword:** Newcastle disease virus; AF2240; Breast cancer; 4 T1 cells; Cytokines