

Apoptosis Pathways Induced by Recombinant Adenovirus in Cancer Cells

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Abstract

Apoptosis, or programmed cell death, is an essential physiological process that plays a critical role in development and tissue homeostasis. Expression of VP2 gene derived from infectious bursal disease virus (IBDV) has been shown to be able to induce apoptosis in the cancer cells, which possibly renders it useful in cancer treatment regimes. However, the mechanism of the on-going apoptosis process is not clear. In this study, the apoptotic effect induced by the expression of VP2 gene in cancer cells was investigated. This was done by detecting the caspase activities which are the important components of the apoptosis process. Five types of cancer cells, MCF-7, HepG2, HeLa, MDA and CT 26, were cultured and inoculated with 1×10^6 TCID₅₀ of adenovirus recombinant with the VP2 gene. Activities of caspase 8, 9, 2 and 3, 7, 10 were then studied by adding specific substrate to the samples, resulting in the release of free dye, which can be measured by spectrophotometry. Active caspase 9 and caspase 3, 7 10 were detected in all of the cancer cells. The findings suggest that the the apoptotic event in cancer cells treated with the adenovirus recombinant with VP2 gene followed the intrinsic pathway.

Keywords: apoptosis, VP2, infectious bursal disease virus, intrinsic pathway, caspases, cancerous cells.