

Apoptosis Study on the Effect of PMF on Different Cancer Cells

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ABSTRACT

PM 701, a natural liquid product, has anticancer activity. The bio-active fraction G, which is coded PMF has recently been isolated from PM 701. PMF was proved to have cytotoxic properties against cancer cells. The target of this study was to investigate the apoptotic effect of PMF in the human cancer cell lines. PMF at concentration of 60 and 100 $\mu\text{g mL}^{-1}$ were incubated with cells during 48 h culture. Metabolic activity were measured colorimetrically by MTT assay (3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide). Apoptotic cell death was also determined by the TUNEL method (terminal deoxynucleotidyl transferase (TdT)-biotin nick end-labeling). The results showed that PMF induced apoptosis in association with increased number of TUNEL positive cells. MTT results showed that PMF decrease cell proliferation via inhibiting metabolic cell activities. We conclude that PMF has anti-cancer effects by increasing apoptosis and altering cellular metabolic activity.

Key words: Breast carcinoma, colorectal cancer cells, glioma cells, liver carcinoma, leukemia cells, lung cancer cells

INTRODUCTION

Apoptosis, programmed cell death, plays a critical role in the cyclic changes and maintenance of homeostasis in multicellular organisms (Schwartzman and Cidlowski, 1993). However, failure to undergo apoptosis is one of the mechanisms associated with oncogenesis and chemoresistance of transformed cells (Green and Reed, 1998). Apoptosis is characterized by DNA fragmentation and chromatin condensation and differs from necrosis, which is characterized by ruptured cell membranes and swollen nuclei (Nagata and Golstein, 1995; Steller, 1995). Impairment of apoptotic signaling enables tumor cells to avoid apoptotic cell death and grow into tumor masses that are resistant to apoptosis (Wyllie *et al.*, 1999). Apoptosis is also an important phenomenon in chemotherapy-induced killing of tumor cells. Several recent reports have indicated that many anti-cancer drugs act through the induction of apoptosis to prevent tumor promotion and progression (Reed, 2002). In addition, many natural products used in cancer chemotherapy work through enhancing apoptotic pathways (Bhalla *et al.*, 1993; Friesen *et al.*, 1996).

In the present study, we investigated the Apoptotic effect of PMF when incubated with different cell lines of human cancer using TUNEL technique. MTT assay was performed to monitor of cancer cells metabolic activity.