

## **Andrographolide induces cell cycle arrest and apoptosis in PC-3 prostate cancer cells.**

### **ABSTRACT**

Andrographolide (AGP), the major phytoconstituent isolated from *Andrographis paniculata* was found to exhibit growth inhibition and cytotoxicity against the hormone-independent (PC-3 and DU-145) and hormone-dependent (LNCaP) prostate cancer cell lines via the microculture tetrazolium (MTT) assay. Due to its greater cytotoxic potency and selectivity towards PC-3 cells, flow cytometry was used to analyze the cell cycle distribution of control and treated PC-3 cells whereas Annexin V-FITC/PI flow cytometry analysis was carried out to confirm apoptosis induced by AGP in PC-3 cells. Cell cycle and apoptotic regulatory proteins were determined by western blot analysis. AGP was found to induce G2/M cell cycle arrest which led to predominantly apoptotic mode of cell death. Mechanistically, AGP was found to downregulate CDK1 without affecting the levels of CDK4 and cyclin D1. Induction of apoptosis was associated with an increase in activation and expression of caspase 8 which then is believed to have induced cleavage of Bid into tBid. In addition, activation and enhancement of executioner caspase 9 and Bax proteins without affecting Bcl-2 protein levels were observed.

**Keyword:** Andrographolide; Prostate cancer; Cell cycle; Cyclin-dependent kinases; Apoptosis; Caspase 8; Caspase 9; Bcl-2 family.