

## CYTOTOXIC AND APOPTOTIC EFFECTS OF CAFFEIC ACID AND CAFFEYOYL MALIC ACID ON BRAIN GLIOBLASTOMA (U87-MG)

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*Urtica dioica* is a kind of plant which is a member of Urticaceae family. Alternative medicines have attracted much attention as potential therapeutic agents in the prevention of cancer. As a medicinal plant, *Urtica dioica* has been used traditionally as a cancer treatment in place of chemotherapy. Caffeic acid and caffeoyl malic acid are phenolic compounds found in *Urtica dioica*. They have biological protective effects on human health such as diabetes, cancer and inflammation. The present study determines the cytotoxic and apoptotic effects of different concentrations (1, 5, 10, 50  $\mu\text{M}$ ) of caffeic acid (CA) and caffeoyl malic acid (CMA) on glioblastoma cell line (U87-MG). Cytotoxic activity studied by using xCELLigence (real-time cell counter) and lactate dehydrogenase (LDH) assay systems against U87-MG. Antiproliferative activity also determined by WST-1 test. And lastly TUNEL assay used to show *apoptosis induced* by CA and CMA on U87-MG. All experiments were run for 48h. Our results show that CA especially in 50  $\mu\text{M}$  concentration has apoptotic and anti-proliferative effects on U87 cell line at 48th hour. 1, 5, 10  $\mu\text{M}$  concentrations of CMA decreased cell number according to the results of xCELLigence and WST-1 at 48th hour. Especially CMA IC50 values of 20  $\mu\text{M}$  also has more apoptotic and anti-proliferative effects on U87 cell line. On the basis of our studies, CMA has anti-proliferative and apoptotic effect on U87 cell lines dependent dose and time manner. As a conclusion we can say that CMA may be used to treat glioblastoma cancer cell types alternatively instead of high toxic chemotherapeutic drugs.



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