

Assessment of Farnesyl Transferase Inhibitory Effect of Crocin in MCF-7 Cell Line

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Abstract

Introduction: Farnesyl transferase inhibitors (FTIs) are a new class of drugs which are under clinical trial examinations for cancer treatment. Saffron extracted components have been reported to be of pharmaceutical properties when are applied in vivo/ in vitro against variety of diseases including cancer. Crocin is one the main chemicals in saffron which is suggested to be of cytotoxic effects against cancer cell lines. However, the exact mechanism of function of crocin against cancer cell lines is still remained to be illustrated by more research. In the present study the effect of crocin in inhibition of lamin B farnesylation was examined.

Methods and Results: Crocin was extracted from saffron and purified by column chromatography as described by bathaie et.al. MCF-7 was cultured on DMEM media containing 10% FBS. Using 96-well-plates, cells treated with an increasing concentration range of 10-5000 ug/ml of crocin. After 24h, MTT assay was carried out to determine the IC₅₀. Cells were treated with crocin (IC₅₀) for 24h to induce cell death, and expression of Lamin B, as well as prenylated/ unprenylated Lamin B was assessed by western blotting, using primary antibody against lamin B (Santacruz, USA) and secondary HRP-tagged anti-rabbit (Sigma, Germany).

Our results indicated that 3500ug/ml of crocin induced cell death in half of cell population upon 24h. We also observed that treatment of MCF-7 cells with 3500ug/ml for 24h results in an obviously significant decrease in lamin B protein expression. Data from gel shift assay analysis also showed that crocin induces prenyl-transferase- inhibitory mechanism in cells which is seen as a two separated bands of lamin B (including prenylated and unprenylated forms) compared to single band pattern in control.

Conclusions: In conclusion, our results proposed that crocin induces prenyl transferase inhibition in MCF-7 cell line of breast cancer and therefore, it could be suggested as a potent phyto-compound for research and developing FTIs.

Key words: Farnesyl transferase inhibitors, breast cancer, crocin, lamin B