

2<sup>nd</sup> International Conference on

# FOOD CHEMISTRY & NUTRITION

July 24-26, 2017 Vancouver, Canada

## *In vitro* antimetastatic effects of crocin on triple negative metastatic breast cancer cells

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Cancer metastasis is the cause of 90% of all deaths from cancer. Various types of cancer have different malignancy potency, among them breast cancer is the second most malignant cancer in women. Therefore, agents that inhibit metastasis provide a major advantage in treating cancers. Crocin is a major carotenoid present in Saffron (the red dried stigma of *Crocus sativus L*), which exhibits anti-tumor and apoptotic effects against primary tumors. The present study has been designed to investigate the anti-metastatic effects of crocin on the metastatic triple negative breast cancer cell line. The 4T1 cells (closely resemble metastatic, triple negative breast cancer in humans) with different concentrations of crocin (0-4 mmol/l) were incubated for various times (24, 48 and 72h). Cell viability was assessed by MTT. Scratch assay and transwell chamber assay were performed to investigate the effects of crocin on cellular migration and mobility of cells respectively. The relative attachment of the 4T1 cell to immobilized ECM was evaluated by Cell-matrix adhesion assay. Then, the mRNA levels of major genes in metastasis (matrix metalloproteinase 2, vascular endothelial growth factor 1, e-cadherin and vimentin) were measured by using real-time polymerase chain reaction. It was found that crocin inhibited the growth of 4T1 cells in time- and dose-dependent manners (the IC<sub>50</sub> values were 3.6, 2.7 and 2.5 mmol/L, respectively, at 24, 48 and 72 h). The migration of 4T1 cells was significantly inhibited by crocin even at a very low concentration of crocin (2 mmol/L). Crocin reduced cell mobility even in concentrations lower than IC<sub>50</sub>. It also decreased the adhesion of 4T1 cells in concentrations of 2.5 mmol/L and 2.7 mmol/L by 82.22% and 61.66% of control respectively, in a dose-dependent manner. Crocin unregulated the expression of e-cadherin, the suppressed gene in metastasis, and down-regulated the level of activated genes MMP-2, VEGFa and vimentin. These results indicate that crocin, as a therapeutic herbal product, has antimetastatic potentials in addition to its proven anti primary-tumor effects, so it may be useful for controlling malignant metastatic breast cancer.

### Biography

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