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**Essential oils from dietary spices inhibits MMP-9 expression and prevents cancer cell proliferation and migration in MCF-7 and Panc-1 cells**

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**ABSTRACT**

Matrix metalloproteinases (MMPs) released from the inflammatory cells are involved in the development and progression of human cancers. Among the various MMPs, MMP-9 is found to be involved in metastasis of breast, colon and ovarian cancers. The essential oils from Ocimum sanctum was tested for its effect on inhibiting the proliferation of human breast cancer MCF-7 and Panc-1 cells and reducing the expression of MMP-9. The human lymphocytes were treated with lipopolysacharride to induce inflammation and then treated with essential oils. The expression of MMP-9 was analyzed using gelatin zymography and reverse transcriptase PCR methods. The results showed that MMP-9 expression was completely inhibited at 250 ug/ml of essential oil. A dose dependent decrease in the expression of MMP-9 was observed in reverse transcriptase PCR. The inhibitory effects of essential oils on the proliferation of MCF-7 and Panc-1 cells were tested using MTT assay and real time PCR analysis. We found that Ocimum sanctum essential oil (OSEO) inhibited proliferation and migration of MCF-7 and Panc-1 cells in a dose-dependent manner. The OSEO also induced apoptosis as evidenced by the increasing number of propidium iodide stained apoptotic nucleic of cancer cells. Gene expression analysis revealed that OSEO up-regulates the apoptotic genes p53 and Bid and as well elevates the ratio of Bax/Bcl-2. The results of our study proved that OSEO has the ability to express both anti-inflammatory and anticancer activities.