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## Inhibition of matrix degrading enzymes and invasion in human glioblastoma (U87MG) cells by isoflavones.

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### Abstract

Glioblastoma multiforme is a primary brain tumor associated with extensive invasion into surrounding brain tissue. Matrix metalloproteinases (MMPs) and urokinase plasminogen activation (uPA) system are shown to be involved in tumor invasion as they help in degradation of extracellular matrix (ECM) proteins and thus assist in the movement of cells. MMP-2 and 9 were shown to be upregulated in gliomas, suggesting their involvement in invasion. Genistein and biochanin A are isoflavones commonly known as phytoestrogens and have some anticancer properties. We hypothesize that these two isoflavones can induce a lowering of tumor invasion by decreasing the activity of matrix degrading enzymes. In this study we investigated the effects of genistein and biochanin A on invasive activity of U87MG cells using the Calbiochem in vitro invasion assay system. Our results suggest that genistein and biochanin A induced a decrease in invasive activity of U87MG cells in a dose-related manner. Genistein also induced a decrease in EGF-stimulated invasion thereby implicating an involvement of EGF-mediated signaling in invasion. Our results also show that treatment of U87MG cells with the two isoflavones induced decreases in the enzymatic activity of MMP-9 and the protein levels of MT1-MMP and uPAR.

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