

Toxicity Effect of Bromoacetic Acid on MCF7 Breast Cancer Cell Line and Analysis of Expression of Apoptosis-Associated Genes

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Not applicable

Abstract

Introduction: Cancer, the uncontrolled division of cells, occurs because of environmental factors and genetic disorders. Breast cancer is the most common cancer and the second leading cause of cancer death in women. Four categories of key genes, including oncogenes, tumor suppressor genes, repairing genes, and programmed– cell death genes, contribute to cancer development. Bromoacetic acid is a chemical compound that is produced both artificially and by bacterial fermentation.

Methods: To investigate the effectiveness of bromoacetic acid in inhibiting the MCF7 cell line proliferation, the MTT assay was done and the expression of genes responsible for the regulation of apoptosis, including *BAK*, *CASP3*, *CASP8*, and *BIM*, was measured after 24, 48, and 72 hours of cell treatment with 2.5 µg/ml of bromoacetic acid using real–time PCR.

Results: The results of the gene expression assays showed that bromoacetic acid treatment increased the expression of key genes *BAK*, *CASP3*, and *CASP8*. However, the expression of *BIM* decreased at all three time points compared with controls.

Conclusion: bromoacetic acid can induce cell death via intrinsic and extrinsic apoptosis pathways.

Keywords: Breast Cancer, Gene Expression, Bromoacetic Acid