**Title:** Effects of an active derivative of Spiro Quinazoline on apoptosis of breast cancer cell lines MCF-7

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**Abstract:** Background Breast cancer is the most common form of cancer and the resistance of breast cancer cells to the available chemotherapeutics is a major obstacle to successful treatment. Quinazoline is the main six-membered heterocyclic ring system reported for their biological activities and it has been used especially as an anti-malarial agent and in cancer treatment. In this study, we used human breast cancer carcinoma cell lines MCF-7 as an experimental model system and examined the growth inhibitory effects of one active derivative of Spiro Quinazoline. Methods The cell lines were cultured in RPMI medium and treated with different concentration of active derivative for different time lengths. Inhibition of proliferation was measured by MTT assay. The morphological changes of cells were observed by fluorescence microscope after acridine orange staining and the apoptosis of cells was examined by DNA agarose gel electrophoresis analysis of DNA fragmentation. Results MTT assay indicated that this active derivative treatment decreased the viability of MCF-7 human breast cancer cells and inhibited proliferation and induced apoptosis of MCF-7 cells in a dose and time dependent manner. Cell cycle distribution determined using flow cytometry of propidium iodide stained nuclei and autophagy was detected by acridine orange staining. Conclusions This active derivative inhibits proliferation of breast cancer cells MCF-7 by inducing cell apoptosis and further studies are require to evaluate effects of that on the apoptotic and anti-apoptotic genes and proteins with RT-PCR and western blot methods.

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