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ANTI-CANCER EFFECT OF L-GLUTAMINASE ON ACUTE LYMPHOBLASTIC LEUKEMIA (RAJI), BREAST CANCER (MCF7) AND COLORECTAL CANCER (A549) CELL LINES

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Background: There are lots of treatments for cancer but always enzymes are the most efficient. Glutamine can be used to support proliferation in multiple ways. It is a proteinogenic amino acid, and can be act as a nitrogen donor for the synthesis of amino acids as well as nucleotides biosynthesis in cellular processes. The presence of L-glutaminase has been reported in various organisms, including animals, plants, and microorganisms except humans. It's a treatment enzyme for ALL and L-glutaminase also has proved ineffectual for treatment solid tumours such as breast cancer and colorectal. In following research Yarrowia yeast glutaminase is used.

Methods: In this study Raji, MCF7 and A549 cell lines were cultured in RPMI 1640 with 10% FBS and 5% of CO_2 condition. The cytotoxic effects of L-glutaminase on Raji, MCF7 and A549 cells were studied using MTT assay. Then, flow cytometry assay was exploited to measure cell death and apoptosis stage.

Results: MTT assay showed that L-glutaminase significantly inhibited the cell growth. According to the flow cytometry assay result, the L-glutaminase was able to induce apoptosis in Raji, MCF7 and A549 cell lines. The apoptosis of Raji cells was more than other cell lines and A549 was more than MCF-7.

Conclusion: According to our finding, L-glutaminase obtained from Yarrowia, safe yeast could successfully induce apoptosis in Raji, MCF7 and A549 cell lines. Therefore, it could be used as a novel and safe therapeutic candidate for cancer treatment.

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