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YEASTS L-ASPARAGINASE INHIBITS CELL GROWTH AND INDUCES APOPTOSIS OF ACUTE LYMPHOBLASTIC LEUKAEMIA (RAJI), BREAST CANCER (MCF-7) AND LUNG CANCER (A549) CELLS IN IN-VITRO SYSTEM

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Background: Cancer is one of the most important problems in the world. Today Enzymes have been intensively studied as a source of antitumor compounds. L-Asparaginase (L-ASNase) is one of the most therapeutic enzyme which used for the cancer therapy. The attendance of L-ASNase has been reported in various organisms, containing animals, plants, and microorganisms (bacteria, fungi, algae, yeast, and actinomycetes) except humans. In this study we used L-ASNase enzyme which isolated from Yarrowia yeast.

Methods: In this study, Raji, MCF7 and A549 cell lines were cultured in RPMI 1640 with 10% FBS and 5% of CO2 condition. Cytotoxic effects of yeasts L-asparaginase was assessed by 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay. Then, flow cytometry assay was exploited to measure cell death and apoptosis stage.

Results: According to our findings, yeasts L-asparaginase can inhibit cell growth in a time and dose dependent manner. Flow cytometry assay result showed that yeasts L-asparaginase was able to induce apoptosis in Raji, MCF7 and A549 cell lines. The apoptosis of raji cells is more than other cell lines and A549 is more than MCF-7.

Conclusion: Our results showed that yeasts L-asparaginase 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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