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Abstract

Caspase Gene Expression in Colon Cancer Cells Exposed to 5-Fluorouracil Treatment †

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Colorectal cancer is the third most common type of cancer and remains a significant global health challenge. The treatment of patients depends on the stage at which the cancer is diagnosed, but it is mostly based on chemotherapy. Regarding this, novel treatment strategies are essential for improving existing ones. This study examines the relationship between chemotherapeutic doses and the expression of caspase genes—specifically, caspases 3, 8, and 9—in colon cancer cell lines. Our study involves the application of various concentrations of 5-fluorouracil to clarify the potential upregulation of these apoptotic markers in treated cells. RNA was isolated from cells, and a qPCR analysis was performed. The results showed a heterogenous dose-dependent modulation of caspase expression, pointing out the potential mechanisms underlying cellular responses to treatment. Our findings indicate that both apoptotic pathways are activated upon the addition of the chemotherapy drug, as evidenced by the significant upregulation of both initiator and executioner caspases. This effect is most noticeable at larger dosages of 5-fluorouracil as the response of the cells to the chemotherapeutic drug, and this is in accordance with the previous literature review. This research not only advances our understanding of the molecular dynamics within colon cancer cells but also contributes to better therapy responses.

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