The Impact of Paclitaxel and Doxorubicin on APC Knockout Cells in Breast Cancer

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Around the world, men and women suffer from several types of breast cancer, among them being triple-negative breast cancer (TNBC). TNBC lacks targeted therapy; therefore, it's commonly treated with traditional chemotherapy drugs, like paclitaxel and doxorubicin. Previous studies have shown that the loss of Adenomatous Polyposis Coli (APC) results in resistance to chemotherapy. APC is a tumor suppressor gene that is lost in 30-70% of TNBC patients through mutations. This study's goal was to discover and observe how each of the cell lines, with APC and without, would respond to the chemotherapy treatments that were applied to them. Four replicates of a clonogenic assay were performed using paclitaxel, doxorubicin, and dimethyl sulfoxide. These found the individual colony area for each cell line that could later be used for analysis. Additionally, western blots were used to examine the presence of protein expression in each of the cell lines, specifically pAkt and Akt that contribute to proliferation and radioresistance. It was found that both the APC knockout cell lines and the non-targeting control line responded to the chemotherapy in a positive manner in that their colony areas decreased noticeably. The protein expression relative to actin was learned to be much higher in the APC knockout cell lines compared to the non-targeting control. This research is crucial to breast cancer research given that the majority of patients lack the APC gene. Researchers can use this data for future studies in hopes to improve chemotherapy treatments and the health of TNBC patients.

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