Can APOBEC3B Be a Therapeutic Target for Breast Cancer?

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In estrogen receptor-positive breast cancer, relapse into cancer can result from developed resistance to endocrine therapy such as Tamoxifen or chemotherapy such as 5-Fluorouracil. The purpose of this study is to discover the effects of the level of APOBEC3B gene expression on Tamoxifen and 5-Fluorouracil resistance in breast cancer cell line Michigan Cancer Foundation-7 (MCF-7L). Tamoxifen resistance was tested between 351 (vector control) and 611 (knockdown levels of APOBEC3B gene expression) cells by how quickly the two cell lines developed resistance using counting, doubling times, and quantitative real-time polymerase chain reaction experiments. 5-Fluorouracil resistance was tested between MCF-7L 351 and MCf-7L 611 cells by the difference in resistance pathways using methylthiazol tetrazolium assays, anchorage-independent growth assays, and western blot analysis. The results showed that 351 cells developed resistance to Tamoxifen quicker than 611 cells. 5-Fluorouracil results showed that 351 cells still had a dose response when treated with 5-Fluorouracil whereas 611 5-Fluorouracil cells gained complete resistance. APOBEC3B levels may contribute to heterogeneity in breast cancer and can be a clinical or therapeutic target.

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