RNAi Therapy in Cancer Treatment II

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Finding a treatment for breast cancer has been a persisting need as one in eight women will experience this disease in her lifetime. Current treatment options present harmful side effects and breast cancer continues to persist in alarming numbers. RNA interference (RNAi), or gene therapy, has been recognized for its ability to silence gene expression through degrading target mRNA strands. Attempting to evaluate RNAi as a viable treatment option in breast cancer can be achieved by studying siRNA's ability to regulate the expression of a gene known as ep300, responsible for encoding p300 found to regulate cell growth. If the protein p300 is silenced through siRNA treatment, then the viability of cancer cell spheroids will decrease. The purpose of this evaluation is to help determine whether RNAi should be investigated and applied to cancer treatment. As spheroids create a more accurate microenvironment for tumor models, MCF-7 breast cancer cells were grown into spheroids for treatment, as well as an additional monolayer trial. Spheroids and monolayer cells were divided into a treatment and both a positive and negative control group. After a several day incubation period allowing for cell growth and the siRNA to make its way to the target mRNA sequence, the well-plate consisting of all the monolayer cells were prepared to go under a cell viability analysis through XTT assay, and the spheroids could be qualitatively analyzed in diameter. The results indicated the treatment increased cell growth for both cell viability in the monolayer cells and diameter in the spheroids, suggesting successful transfection of the gene silencer. Additionally, this gene may be responsible for decreasing cell growth as the inhibition of this gene led to a significantly increased cell count.

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