Overcoming Resistance

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One in eight women will be diagnosed with a form of noninvasive Breast cancer during her lifetime. NEK2 is a highly-expressed gene in Breast cancer. The objective was to determine the role NEK2 plays in the proliferation, migration, chemoresistance, and apoptosis in breast cancer. MCF7 cells were propagated and maintained in 2D and 3D cultures. Cells were treated with NEK2 and Fluorescent-Negative Control siRNA. An MTT assay was performed on Days 0, 1, 2 and 3 to investigate the gene's role on the metabolic rate of the cells. A cell confluency test was performed to investigate the growth of the cells over time. Target cells were treated with 500 nM Paclitaxel and a Cytotoxicity/Viability assay was performed. A Migration Assay was performed over 24 hours. A Green Poly Caspases Detection (GPCD) assay was performed to investigate apoptosis. Standards were run and analysis completed in Image J and Excel. Data from the MTT assay indicated that cells treated with NEK2 siRNA had lower metabolic rates compared to cells treated with Negative Control siRNA. Data from the Confluency assay indicated that cells treated with NEK2 siRNA began to die two days after treatment. Migration assay results indicated there was no statistical difference on Day 0 between groups. On Day 3, the Experimental groups had died so the migration assay was terminated. GPCD indicated apoptosis was induced in cells treated with Experimental siRNA. This suggests that the gene NEK2 plays a role in the increased proliferation, lowered apoptosis, and increased resistance to chemotherapy.

Awards Won:

Second Award of $2,000