The Introduction of Excess Calcium in Cancer Cells

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In the project, “the Introduction of Excess Calcium in Cancer Cells” liposomes/lipofectamines were used to transport calcium chloride into cancer cells. The purpose was to see if liposomes could be used to carry calcium into cancer cells, observing the amount of living cells at the end of the experiment. Liposomes typically carry DNA and drugs into cells, because their lipids are similar to the body's cell membrane lipid bilayer. Calcium is the second messenger in cell death and causes cell apoptosis, so increased levels should trigger increased amounts of cell death, even in cancer cells which resist apoptosis. To test this hypothesis, different calcium solutions were used (150mM, 75mM, 15mM, and 7.5mM) and analysis was done after the time 24 and 48 hour time periods. The number of living cells remaining after exposure to the calcium and lipofectamine solution was determined through the use of a crystal violet in combination with spectrophotometry to determine cell counts. This dye was diluted in a vinegar solution and placed on a plate reader to get the absorbance level. The absorbance would then be analyzed through a standard curve line equation. The ending data supported the hypothesis because there were far fewer cells in the solution wells than control wells. For example, the 150mM solution saw a 77% decrease in cells in the 24 hour group, while the Control saw a 372% increase in cells. This means the calcium was able to make it into the cells, with the help of the liposomes, causing cell death. This project has the potential to add to or replace chemotherapy, in hopes of being effective and with fewer side effects. But more testing is needed, such as testing its effect on normal cells.

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