Titanium (IV) Oxide and Its Subsequent Effects on Cultured Cells

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Titanium (IV) Oxide is a common whitener found in a variety of substances with little to no research conducted on its effects on cellular activity. This lack of research provoked me to begin experimentation of cultured cells. Cos7 cells (monkey fibroblast kidney cells) were plated using DMEM media and allowed them to incubate for approximately 96 hours at 37° C. They were retrieved from the incubator, the old media was suctioned, and new media with a dilution of Titanium (IV) Oxide was added. After the allotted time, the cells were then taken and the Caspase assay was administered to the cells, specifically looking for the enzyme, caspase, as an indication that apoptosis had occurred. The cells were observed and recorded under a light/florescence microscope. When observed under florescence, dead cells radiated a bright green, giving us an approximation of the percentage of cell death. The solution of 5.5µg had the least relative amount of apoptosis (~30%), while the solution of 15.5µg had the greatest percentage of apoptosis (70%). This data gives the general public a relative value of apoptosis occurring in our cells when Titanium (IV) Oxide is present. I concluded that Titanium (IV) Oxide present within somatic cells has a direct correlation to the rate and occurrence of apoptosis, potentially leading to increased levels of mutation, resulting in significant damage to the organism.

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