**534b Cytotoxicity and Cellular Transport of Magnetite Nanoparticles Utilizing the Caco-2 Cell Model**

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Previous studies have shown that superparamagnetic particles subjected to an oscillating magnetic field induce magnetocytolysis in certain tumors. However, the mechanisms of nanoparticle/tissue interactions are still not clear, hence we study the cytotoxicity and transport mechanism of magnetite ($Fe_3O_4$) nanoparticles in the model human colon cancer cell Caco-2. Cytotoxicity was examined by exposing cells to various concentrations of ferrite-based nanoparticles coated with crosslinked dextran with a particle size range of 6-13 nm for 2, 6, and 24 hours of contact. Cell viability was analyzed using the assay Cell-Titer Blue, which measured cell metabolism. Studies indicated that viability was affected primarily by nanoparticle concentration and not by the synthesis method (aqueous co-precipitation and templated synthesis in reverse micelles). High concentration of nanoparticles, approximately 2.31 g/L, was associated with a low viability. Lower concentrations, within a range of approximately $10^{-4}$ g/L, exposure time did not affect cell viability even after 24 hour contact. Transport of the ferrite-based nanoparticles within a cell monolayer was studied using nanoparticles coated with crosslinked fluorescein isothiocyanate dextran (FITC dextran). Cells were exposed to the fluorescent labeled nanoparticles and examined using a confocal laser scanning microscope. Preliminary results suggested that particles were transported through the cell membrane, invading the cytoplasm of the cells.