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Intracellular distribution of Fe_3O_4 nanoparticles in both human and mouse cells MAHESHIKA PALIHAWADANA ARACHCHIGE, SUVRA LAHA, AMULYA RAJAGOPAL, SANJANA KULKARNI, SHUO WANG, AMANDA FLACK, CHUNYING LI, BHANU JENA, GAVIN LAWES, Wayne State University — In recent years there has been an increasing interest in developing Fe_3O_4 nanoparticles for biomedical applications including targeted drug delivery and magnetic resonance imaging. Understanding of the intracellular distribution of these nanoparticles is crucial when considering these nanoparticles for specific applications. We have synthesized Fe_3O_4 nanoparticles having average size of 14 nm using a co-precipitation technique, which were coated with dextran. We studied the structural and morphological characteristics of the nanoparticles using x-ray diffraction, electron microscopy, dynamic light scattering, and zeta potential measurements. We also characterized the magnetic properties of the nanoparticles. In order to investigate the intracellular distribution of these Fe_3O_4 nanoparticles, we functionalized the dextran coated Fe_3O_4 nanoparticles with a fluorescent dye, Fluorescein isothiocyanate (FITC), and cultured them with both mouse insulinoma MIN 6 cells and human pancreatic MIA PaCa 2 cells. Using optical microscope we investigated the intracellular distribution of the nanoparticles and the effects on cell growth.

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