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Cytotoxicity Evaluation on Mammalian Tumour Cell Lines

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Nanotechnology is a scientific technology that is fast-growing. In several ways, nanoparticles have intense scientific applications. It can be used either as a treatment agent to combat disease or as a delivery vehicle to transport the therapeutic drug to a designated biological organ, tissue and cell, depending on the physical and chemical characteristics of a nanoparticle. One of the key issues of clinical practices is the assessment of cytotoxicity of nanoparticles to prevent unintended or unwanted reactions that might exacerbate the situation. The most commonly used nanoparticle in medical fields for treatment, diagnosis, and imaging is the iron oxide nanoparticle (IONP). To test the cytotoxicity of TAT-IONPs, which showed no important cytotoxic impact on mammalian breast cancer cells, WST-1 assays and flow cytometry were used (MCF-7). The accumulation of nanoparticles in the cytoplasm of the cell was assessed by measuring the size of the endosome from TEM images. The results indicate that TAT-IONPs can be used as a safe and non-toxic nanoplatform at 50 µg/ml or less for targeted delivery. They also present an approach by which, from the TEM images of fixed cells, the intracellular endosome region can be evaluated. The endosome size increased in a time-dependent manner in this sample.

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