

## **The cytotoxicity and cellular interaction of MWCNT-Fe composites**

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There has been growing interest in applying multi-walled carbon nanotubes (MWCNTs) in biology and medicine. MWCNTs due to their one-dimensional, hollow nanostructure and special physicochemical properties have won enormous attention in nanomedicine. The knowledge about the toxicity of those nanomaterials is still not satisfactory. It is likely that toxicity of MWCNTs will depend not only on concentration but many other morphology related factors e.g length, diameter, type of functionalization and the type of attached molecules. Thus, evaluation and characterization of the toxic potential of synthesized nanomaterials and their cellular interactions are necessary.

The aim of the research was to analyse the cytotoxicity and the impact of MWCNTs on the cells response. MWCNTs were synthesised by Chemical Vapor Deposition (CVD) technique. Consecutively, were oxidized and functionalized by selected polymers. Polyethylene glycol (PEG) with different molecular weight was covalently attached to MWCNTs surface to increase their solubility in liquids, thus biocompatibility.

For in vitro investigation of MWCNTs two human cell lines (HeLa and normal human fibroblasts) were used. The effect of MWCNTs on the viability of the cells was analysed by cytotoxicity assays (WST-1 and MTT) as well as by In Cell Analyzer. The intracellular localisation of MWCNTs in HeLa cells was observed in confocal microscopy after organelles staining. Our research indicated the cytotoxicity increase with the higher MWCNTs concentration. However, the PEG-MWCNT treated cells investigation has revealed the higher viability and unchanged cell morphology in comparison with non functionalized MWCNT samples.

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