

Cytotoxicity Studies of Covalent and Noncovalent Functionalized Carbon Nanotubes (CNTs)

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Prospects for novel uses of carbon nanotubes (CNTs) in biological systems are becoming an increasing reality. Although some work has been done to investigate the cytotoxicity of pure CNTs, there have been no publications investigating the toxicity and biocompatibility of CNTs having polyaminobenzene sulfonic acid (PABS) covalently bound at their surface. Preliminary results indicated that as the concentration of PABS functionalized single walled carbon nanotubes (*called* PABS-CNTs) in the presence of hepatocyte cells increased from 6.25mg/mL to 100mg/mL, cell viability decreased probably due to the toxic effects of CNTs. Cell viability was determined using MTT dye assay technique whereby mitochondrial dehydrogenase of living cells convert soluble MTT dye into an insoluble dark blue formazine crystals. Layer-by-layer (LbL) nanoassembly functionalization of CNTs is expected to deliver a new alternative to increasing the biocompatibility of CNTs by noncovalently attaching biocompatible species such as polystyrene sulfonate (PSS). We will later investigate the biocompatibility of PSS functionalized carbon nanotubes.

