

Analysis of the pro-inflammatory response of macrophages grown in substrate containing carbon nanotubes multi-wall (MWCNTs)

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Studies from our group confirmed the non-toxicity of substrate containing carbon nanotubes, as well as the vast proliferation cell on these substrates demonstrating its biocompatibility. However, CNT substrates although nontoxic, can cause changes in cell behavior during the process of cell adhesion to the substrate. To better understand the behavior of cells on the substrates of CNTs, decided analysed adhesion, cell spreading and properties of macrophages to trigger inflammatory response in contact with substrates containing CNTs relating it with bone marrow cell migration. Varying degrees of potential for adhesion and spreading were observed which demonstrated an increased susceptibility for adhesion depending on the applied substrate, however was checked a difficulty of cell spreading, which would justify that these substrates can cause a process of inflammatory signaling promoted by macrophages. Furthermore, it was found that hydrophilic substrates led to greater cellular stimulus causing bone marrow cell migration in vitro and in vivo. However further analysis of the inflammatory response will be held to assure the conclusion about properties of each substrate. These knowledges may assist in the manufacture of biomaterials that might support the process of regenerating an injured tissue by using them in regenerative medicine.