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Effect of multi-walled carbon nanotubes in three different dispersants on MC3T3-E1 cell line proliferation

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Multi-walled carbon nanotubes (MWCNTs) have been reported as both a useful and hazardous biomaterial. In the present study, we examined the relationship between MWCNTs and MC3T3-E1 mouse preosteoblast cell line proliferation. MWCNTs were dispersed in three separate dispersants: FBS, gelatin, and CMC. Cell viability was then measured under various culture conditions and cell morphology was analyzed. We observed proliferation inhibition under specific conditions only, such as when MC3T3-E1 not cultured in calcification medium was exposed to MWCNTs dispersed in gelatin. However, MWCNTs dispersed in FBS or CMC did not adversely affect cell proliferation and was seen to significantly promote it under certain conditions. Furthermore, cell proliferation increased with all dispersants when the cells were cultured in calcification medium. Our results demonstrate that MWCNTs are generally of benefit as a biomaterial for bone substitution.

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