Synergized poly(lactic acid)-hydroxyapatite composites: Biocompatibility study

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ABSTRACT

In vitro biocompatibility of impact modified composites produced from poly(lactic acid) (PLA) and hydroxyapatite (HA) is reported in this study. Surface modification was previously used to facilitate the dispersion of HA in PLA, whereas impact property of the PLA-HA composites was deliberately enhanced as it was necessary. Herein, osteoblast cell culture assay was used to assess the possible effects of HA surface modification and impact modification on the cell behavior in physiological media. Furthermore, antimicrobial properties of the HA were assessed. Evidence of HA modification was confirmed through elemental and spectroscopic analysis. Incorporation of HA offered better cell attachment and proliferation to the PLA matrix, with significant increase in the cell viability (%). Also, modification of HA did not present obvious cytotoxicity to the PLA-HA composite. Conversely, incorporation of impact modifier slowed down the rate of cell proliferation on the composite surface but facilitates increased wettability.

Keywords: biomaterials; impact modifier; in vitro biocompatibility; surface analysis; wettability