

The apatite-forming ability of bioactive glasses – A comparative study in human serum and Kokubo's simulated body fluid

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Streszczenie

Currently, the apatite-forming ability evaluation of a biomaterial employs Kokubo's simulated body fluid (SBF) as a testing medium. As the conventional SBF simulates only the ionic composition and pH of human serum (HS), this study aimed to compare the apatite formation in SBF and HS on the sol-gel-derived bioglass (BG) 83S2 and commercial 45S5 as well as to verify the influence of preincubation of BG in both fluids on cytocompatibility towards human fetal osteoblast cell line hFOB 1.19. The apatite formation in HS was hindered, regardless of the type of used BG. Relatively higher apatite-forming ability was noticed for BG83S2. In direct contact test, both BGs were cytocompatible towards osteoblasts, regardless of the type of used fluid. In the case of extracts; however, only the extract obtained from BG83S2 preincubated in HS did not show the cytotoxic effect. The evaluation of apatite-forming ability in SBF appears to be a fast screening method for comparing the apatite-forming ability of various bioglasses. Nonetheless, SBF is unable to precisely imitate the morphology and crystallinity of apatite observed during the assay in HS, as well as it does not mimic the changes in profiles of osteogenic ions.

Słowa kluczowe

Bioglass, Simultated body fluid, Human serum, Apatite-forming ability

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