

Fabrication, multi-scale characterization and in-vitro evaluation of porous hybrid bioactive glass polymer-coated scaffolds for bone tissue engineering.

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Bioactive glass-based scaffolds are commonly used in bone tissue engineering due to their biocompatibility, mechanical strength and adequate porous structure. However, their hydrophobicity and brittleness limits their practical application. In this study, to improve nanomechanical properties of such scaffolds, pure bioactive hybrid glass and two bioactive hybrid glass-polymer coated composites were fabricated. A complementary micro and nanoscale characterization techniques (SEM, AFM, μ CT, FTIR, compressive test, goniometer) were implemented for detailed description of architecture and physicochemical properties of hybrid bioactive glass-based scaffolds with emphasis on nano-mechanics. The final step was in-vitro evaluation of three dimensional macroporous structures. Our findings show that after polymer addition, architecture, topography and surface properties of the scaffolds were changed and promoted favoured behaviour of the cells.

Słowa kluczowe

Tissue engineering, Scaffold, Bioactive glass, Mechanical properties

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