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# Biocellulose Template for 3D Mineral Scaffolds

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**Abstract :** The field of tissue engineering brings new challenges in terms of proposing original solutions for ongoing medical issues, improving the biological performances of existing clinical systems and speeding the healing process for a faster recovery and a more comfortable life as patient. In this context, we propose the obtaining of 3D porous scaffolds of mineral nature, dedicated to bone repairing and regeneration purposes or employed as bioactive filler for bone cements. Thus, bacterial cellulose - calcium phosphates composite materials have been synthesized by successive immersing of the polymeric membranes in the precursor solution containing Ca2+ and [PO4]3- ions. The mineral phase deposited on the surface of biocellulose fibers was varied as amount through the number of immersing cycles. The intermediary composites were subjected to thermal treatments at different temperatures in order to remove the organic part and provide the formation of a self-sustained 3D architecture. The resulting phase composition consists of common phosphates, while the morphology largely depends on the preparation parameters. Thus, the aspect of the 3D mineral scaffolds can be tuned from a loose microstructure composed of large grains connected via monocrystalline nanorods to a trabecular pattern crossed by parallel internal channels, just like the natural bone. The bioactivity and biocompatibility of the obtained materials have been also assessed, with encouraging results in the clinical use direction. In conclusion, the compositional, structural, morphological and biological characterizations sustain the suitability of the reported biostructures for integration in hard tissue engineering applications.

**Keywords :** bacterial cellulose, bone reconstruction, calcium phosphates, mineral scaffolds
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