

Supplementary Information

"Electrochemically-assisted Deposition on TiO₂ Scaffold for Tissue Engineering: an Apatite Bio-Inspired Crystallization Pathway"

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Figure SI1

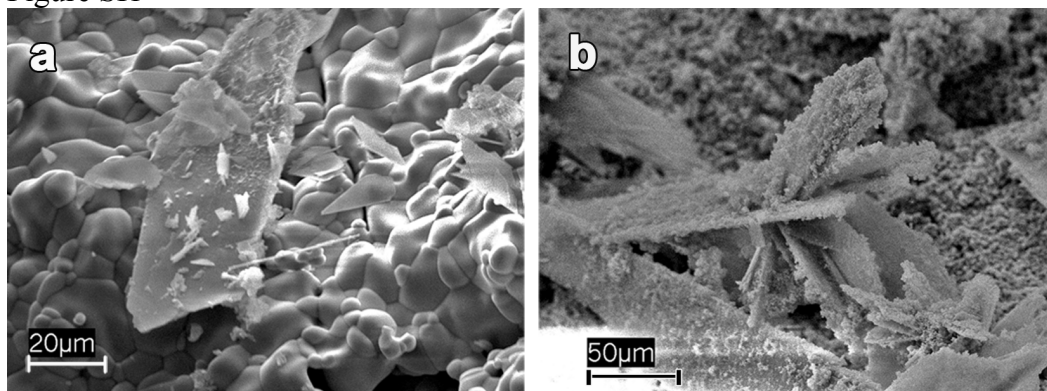


Figure SI1. SEM micrographs shown hydroxyapatite crystals originated through homogeneous nucleation in the electrolytic solution and then deposited onto the outer surface of (a) TiO₂ scaffolds (b) composite scaffolds.

Figure SI2

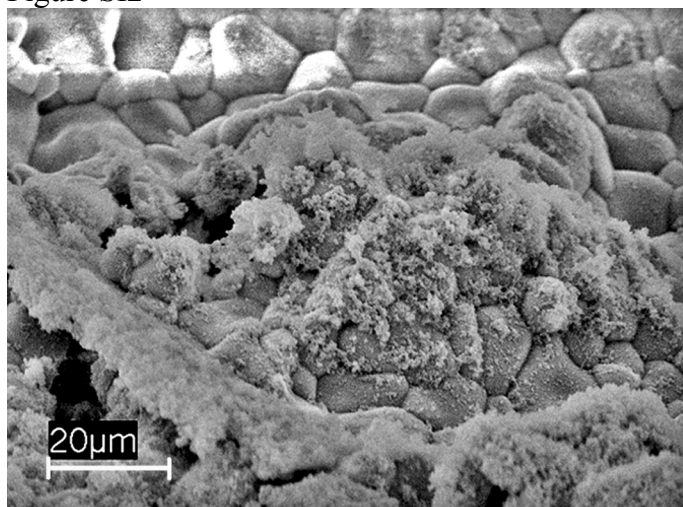


Figure SI2. SEM image of the coating of amorphous CaCO_3 observed onto the TiO_2 scaffolds surface after the electrochemical deposition and alkaline post-treatment.

Figure SI3

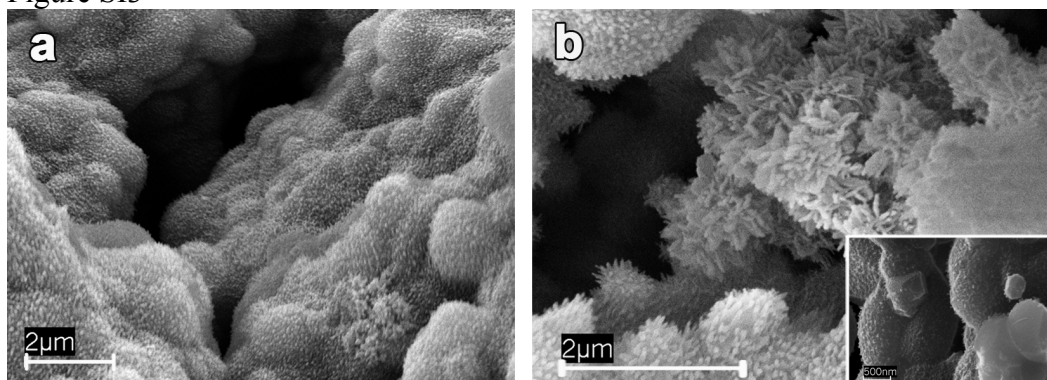


Figure SI3. High magnification SEM images of the composite scaffolds surface after the electrochemical deposition and alkaline post-treatment: (a) the coating obtained onto the inner scaffolds surface is homogeneous (b) and it grows also into the pores. The inset b shows a region where the crystal growth is starting and the dimension of the crystallites is in the range of tens of nanometers.

Figure SI4

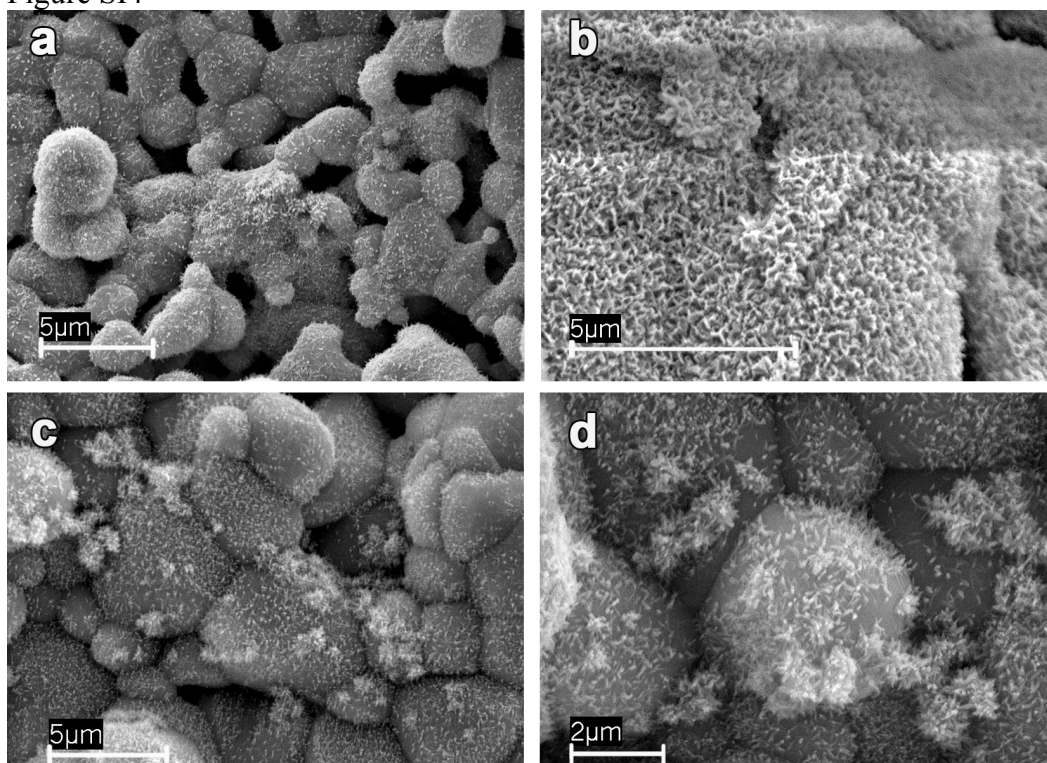


Figure SI4. SEM images of the carbonated hydroxyapatite crystals grown onto the surface of TiO_2 scaffolds deposited and soaked in NaOH after immersion in SBF for 14 days.

Figure SI5

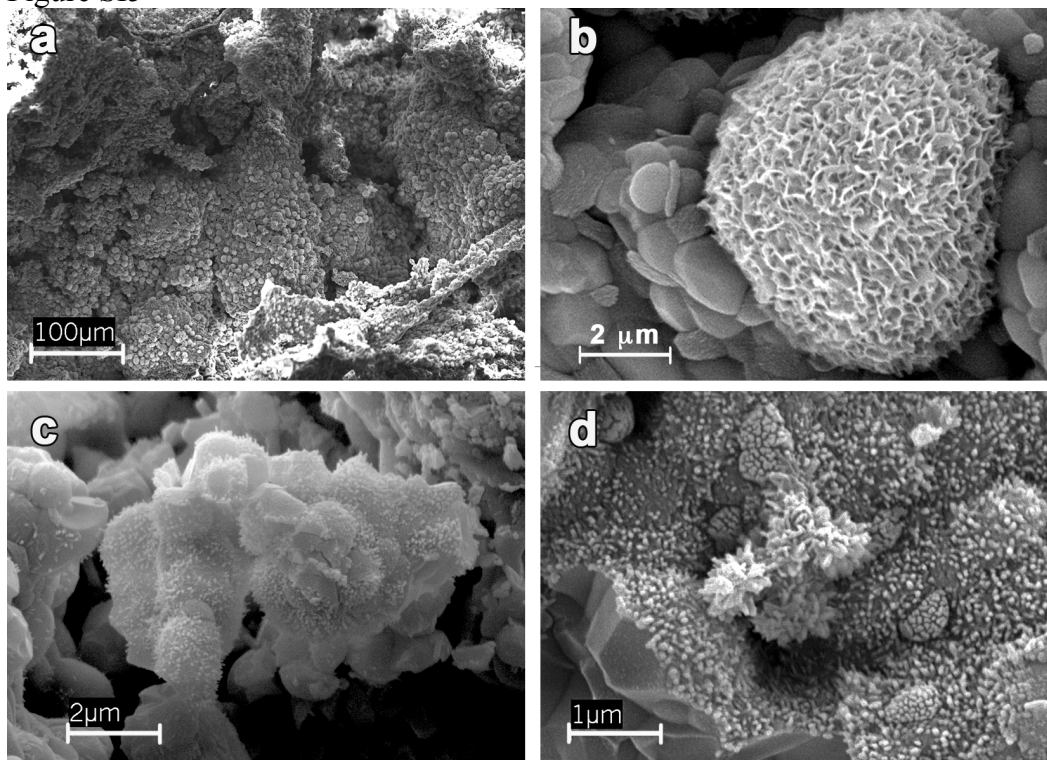


Figure SI5. Composition of SEM images shown the composite scaffolds surface after soaking in SBF for 14 days: (a) the panoramic view attempts that the calcium phosphate deposit grows homogeneously distributed; differently the (b) high magnification image highlights the porous cauliflowers-like morphology of the growing phase. (c) and (d) are SEM images showing the morphology of the coating onto the composite scaffolds after the electrochemical and alkaline treatment and the subsequent immersion in SBF for 14 days.

Figure SI6

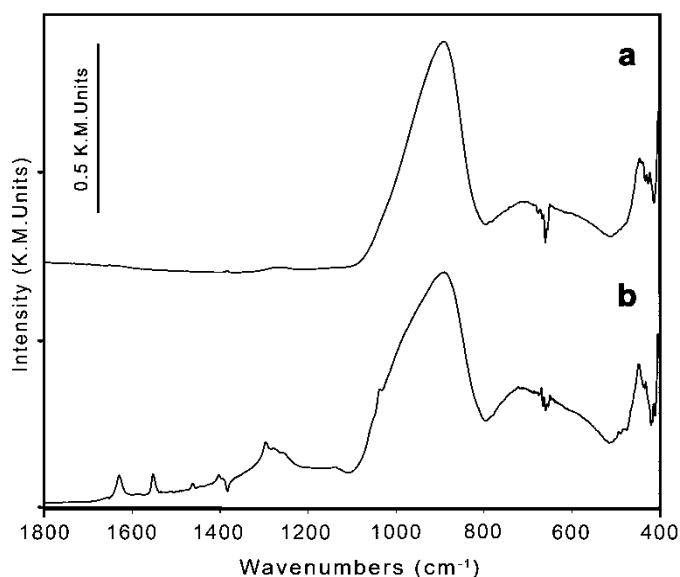


Figure SI6. DRIFT spectra of TiO_2 scaffolds (a) after immersion in $\text{Ca}(\text{NO}_3)_2$ 0.042 M and $\text{NH}_4\text{H}_2\text{PO}_4$ 0.025 M for 3 h and post-treatment in NaOH 1 M for 22 h; (b) soaked in SBF for 14 days, the spectra indicates the presence of tris(hydroxymethyl)aminomethane adsorbed onto the surface of the scaffold. The intensity are normalized to the Ti-O stretching peak at 897 cm^{-1} .

