



16-18 April 2018 - Santiago de Compostela, Spain



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The impact of biomimetism in synthetic bone grafts: from the lab to the market

The design of bone substitutes that can enter the physiological bone turnover cycle, i.e., that can be resorbed and replaced with new bone the same way that impaired bone is replaced in the bone turnover process, is a great challenge. But how can this be achieved? New approaches, based on the combination of advanced fabrication technologies with the biomimetic processing of self-setting calcium phosphates, will be presented. These methods allow obtaining biomimetic hydroxyapatite via precipitation reactions at body temperature, in conditions that are very close to the ones leading to biomineralization phenomena. The impact of different properties, like stoichiometry, crystallinity, nanostructure and pore architecture, in the biological performance of calcium phosphate bone substitutes, and specifically on the osteoinduction and osteogenic potential, will be described.

In the second part of the talk, I will introduce some issues related to the translation of these scientific developments to the market, based on my experience as founder of the spin-off company Mimetis Biomaterials, which develops biomimetic bone substitute materials.