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SCAFFOLDS WITH BG 45S5 AND CROSS-LINKED SILK

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Bioglass is the first invented bioactive glass, also known as 45S5, an important family of ceramic that are used to regenerate bone tissue. Although it has been used in many cases, when it is sintered to obtain a solid piece, this glass transforms into crystal structure and it is not a glass anymore with and presents a notorious decrease of its bioactivity. In order to avoid this problem, a new approach has been developed with the inclusion of silk as a polymer in the inner structure. Silk is a widely used biomaterial that can help the proliferation of bone cells. The present study is focused in obtain scaffolds with BG 45S5 and crosslinked silk, that acts as a net holding the bioactive glass particles. To process this material, a freeze casting technique has been selected, as it is possible to create high porous scaffolds with a high interconnected porosity with this technique. The obtained samples were physically, chemically and biologically characterized, obtaining a complete recover of the bone tissue in an in vivo experiment during 10 weeks in a rabbit skull. Next steps are focused in conform this same materials scaffolds through a 3D printer, that will allow to create samples with a desired shape and size. A new start-up company is being created, Mat Print that will commercialize 3D printed ceramic samples and it is being developed from the research carried out from the Instituto de Cerámica de Galicia.