# Flexible and injectable fibrous scaffolds for the regeneration of pelvic fractures

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**Abstract**

Pelvic fractures in the elderly population account for 7% of the total osteoporosis-associated fractures. Current treatments rely on extensive and invasive surgery and are therefore, not recommended to elderly patients. Common advice is total rest until natural bone healing occurs, with the associated development of "dysmobility syndromes" upon long periods of bed confinement. Bone tissue regeneration with the aid of injectable osteoinductive materials would avoid invasive surgeries, providing a solution to this problem.

Collagen, the main component of the non-mineralized fraction of bone, and nano-hydroxyapatite (nHA) have been shown to have beneficial effects on the regeneration of bone, promoting an enhance mineralized matrix deposition. Similarly, bioactive mesoporous glasses (BMGs) account for a very high specific surface are (200-500 m2/g) that enhances the deposition of mineralized matrix. To promote a pro-osteogenic and anti-osteoclastogenic behavior, these materials can be doped with strontium and selenium. Here, we report on the fabrication of electrospun UV-crosslinked collagen scaffolds with fiber diameters between 140-180 nm, reinforced with Sr- and Se-doped nHA and BMGs that are exploited for the regeneration of pelvic bone fractures.

**Biography**

Sandra Camarero-Espinosa`s research revolves around the regeneration of complex tissues. The design, synthesis, fabrication and investigation of novel hierarchical polymeric bio(nano)materials whose physicochemical properties can be tuned mimicking nature from the molecular to the macro scale and, the effect of these ones on cell phenotype and matrix deposition.

Sandra Camarero-Espinosa was educated at the University of the Basque Country (Spain) where she obtained her BSc. degree as Chemical Engineer and M.Sc. in Engineering of Advanced Materials. Sha developed her doctoral studies at the Adolphe Merkle Institute (Fribourg, Switzerland) and was recognized with an award to an outstanding PhD thesis by the Swiss Chemical Society. After gaining a fellowship from the Swiss National Science Foundation, she moved to Brisbane (Australia) to work at the Australian Institute for Bioengineering and Nanotechnology. Sandra is now a post-doctoral researcher at the MERLN institute where she works on the development of instructive hierarchical biomaterial scaffolds for the regeneration of complex tissues.