NANOFOROSTEO: Multifunctional injectable nano HAp composites for the treatment of osteoporotic bone fractures

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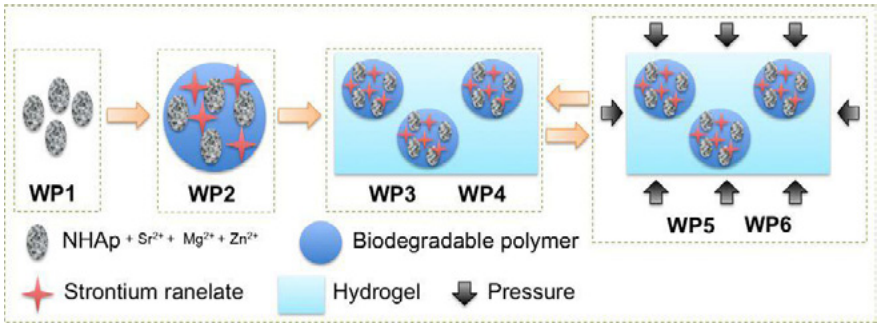
Project description:

The failure of osteosynthesis in cases of large bone defects and osteoporosis fracture repair still lacks adequate clinical orthopaedic solutions. While autograft is still considered the gold standard in many clinical circumstances, synthetic bone void fillers hold several important advantages over autograft treatment. Issues such as the availability and shape of bone tissue and donation site morbidity are avoided with the introduction of synthetic bone void fillers. NANOFOROSTEO focuses on the development of a new, injectable bone void filler, based on chemically modified hyaluronan. This conjugate will have the biological properties of hyaluronic acid, but will solidify at temperatures exceeding 32° C. The filler will easily adapt to the shape of the void. In addition, loading this thermo-responsive hydrogel with nano-microencapsulated hydroxapatite complexes will stimulate bone formation, providing more efficient and effective treatment of bone fractures.



WP1 Synthesis of nanoparticles. WP2 Formation of micro-particle complexes.WP3 Preparation of microparticle/hyaluronan hydrogel compositions.
WP4 In vitro investigations of micro-particle/hydrogel compositions on osteoblast and osteoclast behaviour.
WP5 and WP6 Development of pressure sterilization processes.