

BIOMATERIALS

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Development of nanostructured biomaterials for bone and osteo-articular regeneration

Sybille Facca^{1,2}, Nadia Benkirane-Jessel³ and Arvind Argarwal⁴¹Laboratoire ICube - CNRS, France²Université de Strasbourg, France³Laboratoire INSERM, France⁴Florida International University, USA

During the last ten years, tissue engineering has merged with regenerative nanomedicine by combination, not only of new biomaterials but also of stem cell technology and growth factors. The goal of this work was to use bone and cartilage engineering as a model, in order to improve and to develop active and living nanostructured implants. We were interested in the development of biomaterials (natural or synthetic), tridimensional (3D), transplantable for bone and cartilage diseases treatments, that are able to induce more cellular differentiation and improved tissue regeneration. We have developed 3 types of nanostructured implants, (i) titanium implants coated with hydroxyapatite and carbon nanotubes in order to improve osteoformation and osteoinduction around arthroplasty implants; (ii) active capsules functionalized by growth factors and stems cells for bone induction (*in vitro/in vivo*) after a bone defect; (iii) electrospun nanofibrous membranes functionalized by growth factors and (Osteoblasts/Chondrocytes) for bone and cartilage regeneration, *in vitro* and *in vivo*.

Biography

Sybille Facca, MD, PhD, has her expertise in Orthopedic, Hand and Nerve Surgery as an Orthopedic Surgeon at Strasbourg Hospital University since 2007. She was the first person focusing her research on bone and cartilage regeneration and drug delivery systems of bone cements or nanofibers membranes and osteointegration of orthopaedic implants. Now, she is also focusing her research on tubes for nerve regeneration, microsurgery simulation or microanastomosis mechanical properties and new design of wrist arthroplasty, in a biomechanical laboratory of Strasbourg University.

Sybille.facca@unistra.fr