allied academies Joint Event on
International Conference on
CARDIOLOGY AND CARDIOVASCULAR MEDICINE
&
International Conference on
STEM CELLS AND REGENERATIVE MEDICINE
June 18-19, 2018 | Osaka, Japan
Nadia Benkirane-Jessel, Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C2-004

COMBINED THERAPEUTIC MEDICAL DEVICE AND STEM CELLS FOR REGENERATIVE NANOMEDICINE

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In our group we explored a new generation of smart living implants combining not only active therapeutics but also stem cells, as a novel strategy to regenerate stabilized cartilage and avoid prosthesis, by achieving regeneration of its sub-chondral bone foundation, requirement which is failing today in the clinic. A unique nanotechnology strategy is used to entrap, protect, and stabilize therapeutic agents into polymer coatings: nano-reservoirs, covering nano-fibres of implantable nano-fibrous membranes for bone and cartilage regeneration. Upon contact with cells, therapeutic agents become available through enzymatic degradation of the nano-reservoirs. As cells grow, divide, and infiltrate deeper into the porous membrane, they trigger slow and progressive release of therapeutic agents that, in turn, stimulate further cell proliferation. The nano-reservoirs technology enables to reduce the quantities of required therapeutic agent (compared to soaked membranes for instance) thereby reducing costs.

Biography

Nadia Benkirane is Research director and head of the "Regenerative Nano¬medicine" laboratory, at INSERM. She was leader of "Active Biomaterials and Tissue Engineering" team INSERM 977. She received her PhD. from University Louis Pasteur, France. She joined the IN¬SERM U595 in 2002 as a post-doc, and re¬ceived the diploma to direct the research (HDR) in 2004. Jessel got the permanent position (CR1) in the INSERM 595 laboratory in 2004 and Research Director (DR2) posi¬tion in the INSERM 977 and head of "active Biomaterials and Tissue Engineering team.

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