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Smart and living implant equipped with active therapeutics and stem cells for regenerative nano-medicine

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Recently, we have reported an active nanostructured collagen implant reinforced with human stem cells for bone regeneration. In our group, we have reported a Smart Hybrid Materials Equipped with Nano-reservoirs of Therapeutics and stem cells. This unique nanotechnology strategy is used to entrap, protect and stabilize therapeutic agents into polymer coatings acting as nano-reservoirs enrobing nanofibers of implantable membranes. 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. This constitutes the first instance of a smart living nanostructured hybrid membrane for regenerative medicine. The cell contact dependent bioerodible nano-reservoirs described here will permit sustained release of drugs, genes, growth factors, etc., opening a general route to the design of sophisticated cell therapy implants capable of robust and durable regeneration of a broad variety of tissues.

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Autologous platelet derived growth factors & fibrin rich plasma in management of chronic non healing ulcers: A pilot study

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Background: The platelet derived growth factors (PDGFs) & fibrin rich plasma have been reported to accelerate the process of revascularization, formation of granulation tissues & epithelialization at the ulcer site. PDGFs have been proposed to have beneficial therapeutic effects in chronic non healing ulcers (CNHU). The study was designed to assess the role of autologous PDGFs & fibrin rich plasma in management of chronic non healing ulcers.

Materials & Methods: A total of 30 CNHUs in 25 patients (after excluding 5 dropouts) were treated by applying locally antibiotic ointment containing autologous PDGFs and fibrin rich plasma.

Results: All the 30 ulcers showed signs of improvement upon the topical application of PDGFs enriched antibiotic ointment. 22 out of 30 ulcers achieved complete healing and 8 ulcers were healed partially. The duration and degree of healing process was also affected by various patient related factors.

Conclusion: The application of fibrin rich plasma and PDGFs enriched antibiotic ointment was found to be very easy, cost effective and efficient in treating subjects with CNHU.

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