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Fabrication and Characterization of Electrospun PLGA/Gelatin Nanofiber Tube for Potential Intestinal Stent Application

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An electrospun Poly (lactice-co-glycolide acid) (PLGA) and Gelatin nanofiber tube was fabricated for potential intestinal stent application. Mechanical properties of tube were evaluated by tensile strength and burst strength tests. Physical and chemical properties were evaluated by contact angle measurement, swelling rates and porosity measurements. Biodegradability was investigated by immersion in simulated body fluid (SBF). Biocompatibility was investigated in vitro by cytotoxicity and proliferation studies by MTT assay, confocal microscopy and western blot using IEC-18 (Rat intestinal epithelial cell). After intestinal stent was implanted into rat bowel for periods from 7 to 10days, it was then analyzed using micro-computed tomography (Micro CT) and X-ray techniques. Futhermore, histological analysis was performed by hematoxylin-eosin (H&E) stain.

Keywords: PLGA, Gelatin, Intestinal stent

D-2

Fabrication and Characterization of Novel Electrospun PVPA/PVA Nanofiber Matrix for Bone Tissue Engineering

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A novel electrospun nanofiber membrane was fabricated using combined poly (vinylphosphonic acid) (PVPA) and polyvinyl alcohol (PVA) intended for bone tissue engineering applications. PVPA is a proton-conducting polymer used as primer for bone implants and dental cements to prevent corrosion and brush abrasion. The phosphonate groups of PVPA have the ability to crosslink and attach itself to the hydroxyapatite surface facilitating faster integration of the biomaterial to the bone matrix. PVA was combined with PVPA to provide hydrophilicity, biocompatibility and improve its spinnability. To improve its mechanical strength, PVPA/PVA and neat PVA mixtures were combined to produce a multilayer scaffold. The physical and chemical properties of the of the fabricated matrix was investigated by SEM and TEM morphological analyses, tensile strength test, XRD, FT-IR spectra, swelling behavior and biodegradation rates, porosity and contact angle measurements. Biocompatibility was also examined in vitro by cytotoxicity and cell proliferation studies with MTT assay and cell adhesion behavior by SEM and confocal microscopy.

Keywords: PVPA, PVA, Bone tissue engineering, Electrospinning