BIOMIMETIC ELECTROSPUN NANOFIBROUS SCAFFOLD FROM GUM KARAYA (STERCULIA URENS)/SILK FIBROIN BLEND FOR TISSUE REGENERATION

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Abstract
In the present work, we have fabricated electrospun nanofibrous composites scaffold using tree gum exudates of natural anionic polysaccharide i.e. Gum Karaya (Sterculia urens) blended with silk fibroin at varying ratio for skin tissue engineering. We have investigated various solvent systems for blending the said polysaccharides with silk fibroin. The morphology of the electrospun Gum Karaya/silk fibroin blend nanofibers was investigated in a field emission scanning electron microscope. To check the miscibility and solubility parameter of karaya/silk fibroin nanofiber blend was examined by solution viscosity measurement and Hansen solubility parameters. The dimensional stability of Gum Karaya/silk fibroin blend nanofibers before and after the treatment/crosslinking was conducted. In order to assay the cytocompatibility and cell behavior on the Gum Karaya/silk fibroin blend nanofibrous scaffolds, initial cell attachment and spreading on the scaffolds were studied. The structural properties of the composites nanofiber were evaluated by Fourier transform infrared spectroscopy. We have demonstrated that the Gum Karaya/silk fibroin blend supports for cell adhesion and proliferation, which demonstrating a potential of blend matrices as skin regeneration substitutes.

Keywords: Gum Karaya; silk fibroin; cell adhesion; tissue engineering

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