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Cell behavior on SiO2-Hydroxyapatite coaxial composite

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In the last years an effort has been made to produce materials which aid in the recovery of damaged tissue. Hydroxyapatite (HA) is a material with lots of potential in tissue regeneration, however, its structural characteristics need to be improved for better performance. In this study SiO_2-HA non-woven electrospun membranes were prepared using HA and SiO_2 obtained through the sol-gel method. Three configurations of the membranes were obtained and tested in vitro, showing that the composite of SiO_2-HA fibers showed a high percentage of viability on a fibroblast cell line. The obtained SiO_2-HA polymeric fibers had approximately 230±20 nm in diameter and were then sintered at 800 °C average diameter decreased to 110±17 nm. The surface area of the sintered SiO_2-HA fibers was 5.77 m^2/g. After sintering the obtained composite, it was characterized by infrared spectroscopy, where the presence of bands corresponding to Si-O, Si-O-Si bonds of silica, phosphate and carbonate where found. XRD confirmed the composite composition by showing peaks corresponding to silica and hydroxyapatite. It is concluded that the fibers of SiO_2-HA set in a coaxial configuration may be helpful to develop materials for bone regeneration.