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Wettability of Biodegradable Electrospun Scaffolds with Different Thicknesses for Tissue Engineering Application

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The use of nanofibrous scaffolds in tissue engineering is very promising since they mimic the extracellular matrix providing an ideal structure to cellular growth. The blend of the biodegradable polymers, polycaprolactone (PCL) and gelatin, combines the high mechanical strength from the first polymer with the great hydrophilicity from the second one, which allows cellular adhesion[1]. The wettability assessment indicates the quality of the substrate surface, roughness and hydrophobicity/hydrophylicity, by simply measuring the contact angle of a drop of the liquid with the surface [2]. In this work, four sets of PCL/gelatin scaffolds with different thicknesses, electrospun in the same conditions, were evaluated. The membranes identified by their average thicknesses, 0,11±0,01 mm, 0,14±0,03 mm, 0,20±0,02 mm and 0,31±0,04 mm, presented contact angles varying between 12° and 49°, appropriate for the expected mixed properties from both polymers. However, the blend composition remained the same and since the polymers are immiscible, the lowering of the contact angle as the thickness is incremented can be explained by the increased presence of the gelatin spots per unit area, with improved capillarity in the non-woven membranes.

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