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Implantation of Small Artery Vessel from Blends PCL/PU with and without Anti-thrombus

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In this experiment, artificial blood vessel was fabricated from electro-spun PU/PCL. To assist with endothelial growth, PU/PCL surface was coated with the RGD peptide. To prevent a clot of blood, anti-thrombus agent was loaded to the fibrous mat and values were reflected through FT-IR data. In vitro study, SEM and MTT data showed that the component was of excellent biocompatibility and cell proliferation. In in vivo study, the artificial blood vessel was implanted in a dog's artery. The results of the CT scan, ultrasound and H&E staining showed that artificial blood vessel was excellent for artery replacement applications.

Keywords: PU, PCL, electrospinning, in vitro, in vivo

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Cellular Adhesions and Protein Dynamics on Carbon Nanotube/Polymer composites Surfaces

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Possessing of carbon nanotubes in biopolymer intrigued much interest due to their mechanical and unique nanoscale surface properties. Surface stiffness can be controlled by the amount of carbon nanotubes in polymer and surface wettability can be altered by the order of nanoscale surface roughness. Protein adsorption mechanism on nanostructured carbon nanotube/polymer thin film will be discussed in this study. In addition, we identified that mechanical stimuli also contribute the messenchymal stem cell and bone cell interactions. Importantly, live cell analysis system also showed altered morphology and cellular functions. Thus, embedding of carbon nanostructures simultaneously contribute to protein adsorption and cellular interactions. In conclusion, this study demonstrated the evidence that nanoscale surface features determine the subsequent biological interactions, such as protein adsorption and cellular interactions.

Keywords: carbon nanotube, biopolymer, protein, live cell