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Cell retension on zein electrospun fiber films

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Thrombosis and intimal hyperplasia is the main reason that an artificial blood vessel can't keep its long-term patency. Studies have shown that a complete endothelial cell monolayer on the surface of the lumen can effectively reduce thrombosis and intimal hyperplasia. Therefore, the ability of the lumen that can keep endothelial cells adhereing to the surface is a key point in the study of artificial blood vessels. In this study, we use electrospining technique to construct zein surfaces with different micro-/nanostructures. The surface microscopic morphology of (including fiber microscopic morphology, diameter, orientation, anti-swelling modification effect), hydrophilicity, Surface roughness and protein adsorption were characterized or measured. The morphologies of different types of cells on different surfaces were studied. The shear stress of about 15 dynes/cm^2 was provided by a self-made parallel plate flow chamber to simulate the erosion of blood on the vessel wall, and adhesion of different cells on zein surfaces with different micro-/nanostructures were studied. The results showed that the zein electrospun fiber films could remarkably improve the retention of fibroblasts (L929); however, they did not improve the retention of endothelial cells (EAhy926). There is no significant correlation between the retention of EAhy926 cells on the fiber films and the diameter of fibers.

Biography

Jin Ye Wang, received Ph.D. from Tohoku University, Japan (1992), professor of Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences (2000-2009), professor of Biomedical Engineering and team leader of Biomaterials Lab, Shanghai Jiao Tong University (2009-present). Research interests include Tissue Engineering, Controlled Release and Fluorescent Probe, Biomimetic Materials and Biointerfaces.

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