

Cold Plasma Surface Modified Electrospun Microtube Array Membrane for Chitosan Immobilization and Their Properties

Authors : Ko-Shao Chen, Yun Tsao, Chia-Hsuan Tsen, Chien-Chung Chen, Shu-Chuan Liao

Abstract : Electrospun microtube array membranes (MTAMs) made of PLLA (poly-L-lactic acid) have wide potential applications in tissue engineering. However, their surface hydrophobicity and poor biocompatibility have limited their further usage. In this study, the surface of PLLA MTAMs were made hydrophilic by introducing extra functional groups, such as peroxide, via an acetic acid plasma (AAP). UV-graft polymerization of acrylic acid (G-AAc) was then used to produce carboxyl group on MTAMs surface, which bonded covalently with chitosan through EDC / NHS crosslinking agents. To evaluate the effects of the surface modification on PLLA MTAMs, water contact angle (WCA) measurement and cell compatibility tests were carried out. We found that AAP treated electrospun PLLA MTAMs grafted with AAc and, finally, with chitosan immobilized via crosslinking agent, exhibited improved hydrophilic and cell compatibility.

Keywords : plasma, EDC/NHS, UV grafting, Chitosan, microtube array membrane (MTAMs)

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