

Fabrication of multi-layered electrospun fibers by self-assembly approach

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Conventional electrospinning process produces sheet-like layers which might limit their applications to various fields. Controlling macroscopic structure of electrospun fibers has been an important issue, especially in the field of tissue engineering which requires artificial supports capable of mimicking tissue structure. Among many attempts, techniques to fabricate multi-layered electrospun fibers have been reported due to the mimicking ability of the multi-layered fibers for layered tissue. These techniques make use of sequential electrospinning, wet electrospinning, sintering or stacking which require additional equipment or post-processes. In this study, a facile way to fabricate multi-layered fibers was introduced. Self-assembled fibers having numerous layers were successfully fabricated using the electrostatic repulsion between deposited fibers and adjacent jets. The layered structure was demonstrated by SEM images and its potential application to tissue engineering and drug delivery system was evaluated. This novel technique to construct multi-layered fibers will extend the use of electrospun fibers for various applications.