Electrospun Composite Nanofibers for Biomedical Applications

C. T. Lim PhD

NUS Life Sciences Institute, Singapore-MIT Alliance, Division of Bioengineering and Department of Mechanical Engineering, National University of Singapore

Abstract

The last decade has seen significant progress made in the fabrication of nanofibers using an ultrafine fiber fabrication technique called electrospinning. One of the major driving momentums to it is the potential use of nanofibers for various biomedical applications, in particular, tissue engineering or regenerative medicine. Electrospun nanofibers are able to emulate the architecture of native extracellular matrix (ECM), a complex fibrous network of proteins and glycosaminoglycans with hierarchical dimensions down to nanometer scale. Electrospun nanofibers can therefore provide *in vivo* like nanomechanotransductive signaling cues to the cells for establishing apposite cell-scaffold interactions and promoting functional changes between and within cells towards the synthesis of genuine extracelluar matrix over time. Under this context, this presentation will give an overview of our recent research work concerning the development of electrospun composite nanofibers in the form of blended, core-shell structured nanofibers and nanofibers mingled structures as possible biomimetic and bioactive cellular scaffolds for tissue engineering applications.