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Process Optimization of Electrospun Fish Sarcoplasmic Protein Based Nanofibers

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Abstract : In recent years, protein, lipid or polysaccharide-based polymers have been used in order to develop biodegradable materials and their chemical nature determines the physical properties of the resulting films. Among these polymers, proteins from different sources have been extensively employed because of their relative abundance, film forming ability, and nutritional qualities. In this study, the biodegradable composite nanofiber films based on fish sarcoplasmic protein (FSP) were prepared via electrospinning technique. Biodegradable polycaprolactone (PCL) was blended with the FSP to obtain hybrid FSP/PCL nanofiber mats with desirable physical properties. Mixture solutions of FSP and PCL were produced at different concentrations and their density, viscosity, electrical conductivity and surface tension were measured. Mechanical properties of electrospun nanofibers were evaluated. Morphology of composite nanofibers was observed using scanning electron microscopy (SEM). Moreover, Fourier transform infrared spectrometer (FTIR) studies were used for analysis chemical composition of composite nanofibers. This study revealed that the FSP based nanofibers have the potential to be used for different applications such as biodegradable packaging, drug delivery, and wound dressing, etc.

Keywords : edible film, electrospinning, fish sarcoplasmic protein, nanofiber
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