

## Electrospinning and Characterization of Silk Fibroin/Gelatin Nanofibre Mats

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**Abstract :** In this study, Bombyx mori silk fibroin/gelatin (SF/GT) nanocomposite with different GT ratio (SF/GT 100/0, 90/10 and 70/30) were prepared by electrospinning process and crosslinked with glutaraldehyde (GA) vapor. Properties of crosslinked SF/GT nanocomposites were investigated by scanning electron microscopy (SEM), mechanical test, water uptake capacity (WUC) and porosity. From SEM images, it was found that fiber diameter increased as GT content increased. The results of mechanical test indicated that the SF/GT 70/30 nanocomposites had both the highest Young's modulus of 342 MPa and the highest tensile strength of about 14 MPa. However, porosity and WUC decreased from 62% and 405% for pristine SF to 47% and 232% for SF/GT 70/30, respectively. This behavior can be related to higher degree of crosslinking as GT ratio increased which altered the structure and physical properties of scaffolds. This study showed that incorporation of GT into SF nanofibers can enhance mechanical properties of resultant nanocomposite, but the GA treatment should be optimized to control and fine-tune other properties to warrant their biomedical application.

**Keywords :** electrospinning, gelatin, silk fibroin, mechanical properties, nanocomposites

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