

Fabrication of 3-dimensional polycaprolactone/polyvinylpyrrolidone electrospun hydrogel-hybrid fibrous scaffolds

진규형, 이슬기림, 김승현, 최우용, 장재형*

연세대학교

(j-jang@yonsei.ac.kr*)

Electrospun fibrous mat has gained much attention as a tissue engineering scaffold due to its ability to mimic the extracellular environment as well as its high surface to volume ratio and ease of processing. However, conventional electrospinning process produces a sheet-like structure which can be a critical limitation in terms of creating three-dimensional cellular environment. In this study, an alternative side-by-side electrospinning process was suggested to create hydrogel-hybrid fibrous scaffolds having both hydrophobic and hydrogel-like properties. The swelling of hydrogel portions (crosslinked polyvinylpyrrolidone(PVP)) induced the conformational changes of the fibers and led to the highly porous three-dimensional fibrous scaffolds. Polycaprolactone (PCL) was used to retain the fibrous structure of the scaffolds and support cellular attachment by conferring hydrophobic property. The cellular infiltration into the scaffolds was confirmed by hematoxylin and eosin (H&E) staining and this showed the applicability of the hydrogel-hybrid fibrous structure to tissue engineering scaffolds.