Temporally controlled release of adeno-associated viral vectors from core/shell co-axial electrospun scaffolds

이슬기림, 김정숙, 장재형*
연세대학교
(j-jang@yonsei.ac.kr*)

Temporal control of the release of viral vectors from polymeric scaffolds enables many tissue engineering applications. In this study, pheochromocytoma (PC12) cells adhered on scaffolds were employed as an in vitro spinal cord injury model. Two kinds of adeno-associated viral vectors (AAV), known as their non-pathogenic property and efficiency in human gene therapy, encoding basic fibroblast growth factors (bFGF) and nerve growth factors (NGF) production, were encapsulated by co-axially electrospun and uniaxially aligned fibers composed of poly(vinylpyrrolidone) as shell and methacrylated hyaluronic acid as core of the fibers. Effects of bFGF-encoding AAVs and NGF-encoding AAVs on neuronal differentiation of PC12s depending on varying release profiles of each AAVs have been investigated. This system can greatly contribute to Tissue engineering as the fundamental of the systems which enable spatiotemporal control of vectors for gene delivery, especially AAVs by regulating controlled release of AAV vectors in time manner and efficient cellular transduction.