Nerve conduit

Nerve conduit is one of strategies for spinal cord injury (SCI) treatment.

Recently, studies showed that biomaterials could guide the neurite growth and promote axon regeneration at the injury site. However, the scaffold by itself was difficult to meet the need of SCI functional recovery.

Currently, neurotrophic factors are being intensely studied for use in bioartificial nerve conduits because they are necessary in vivo for directing axon growth and regeneration.

The basic fibroblast growth factor (bFGF) administration significantly promotes functional recovery after organ injuries.

Using a rat model of T9 hemisected SCI, Shi et al. aimed at assessing the repair capacity of implantation of collagen scaffold (CS) modified by collagen binding bFGF (CBD-bFGF). The results showed that CS combined with CBD-bFGF treatment improved survival rates after the lateral hemisection SCI. The CS/CBD-bFGF group showed more significant improvements in motor than the simply CS-implanted and untreated control group, when evaluated by the 21-point Basso-Beattie-Bresnahan (BBB) score and footprint analysis. Both hematoxylin and eosin (H&E) and immunohistochemical staining of neurofilament (NF) and glial fibrillary acidic protein (GFAP) demonstrated that fibers were guided to grow through the implants. These findings indicated that administration of CS modified with CBD-bFGF could promote spinal cord regeneration and functional recovery [1)].

1)
Shi Q, Gao W, Han X, Zhu X, Sun J, Xie F, Hou X, Yang H, Dai J, Chen L. Collagen scaffolds modified with collagen-binding bFGF promotes the neural regeneration in a rat hemisected spinal cord injury model. Sci China Life Sci. 2014 Jan 20. [Epub ahead of print] PubMed PMID: 24445989.