Complete transection spinal cord injury

Complete transection spinal cord injury (SCI) severely disrupts the integrity of both neural circuits and the microvasculature system. Hence, fabricating a functional bio-scaffold that could coordinate Axon regeneration and vascular reconstruction in the lesion area may emerge as a new paradigm for complete SCI repair. In this study, a photosensitive hydrogel scaffold loaded with collagen-binding stromal cell-derived factor-1a and Taxol liposomes is capable of inducing migration of endothelial cells and promoting neurite outgrowth of neurons in vitro. In addition, when implanted into a rat T8 complete transection SCI model, the above dual-cues-laden scaffold exhibits a synergistic effect on facilitating axon and vessel regeneration in the lesion area within 10 days after injury. Moreover, long-term therapeutic effects are also observed after dual-cues-laden scaffold implantation, including revascularization, descending and propriospinal Axon regeneration, fibrotic scar reduction, electrophysiological recovery, and motor function improvement. In summary, the dual-cues laden scaffold has good clinical application potential for patients with severe SCI [1)].

1)
Liu D, Shen H, Shen Y, Long G, He X, Zhao Y, Yang Z, Dai J, Li X. Dual-Cues Laden Scaffold Facilitates Neurovascular Regeneration and Motor Functional Recovery After Complete Spinal Cord Injury. Adv Healthc Mater. 2021 Mar 19:e2100089. doi: 10.1002/adhm.202100089. Epub ahead of print. PMID: 33739626.