

New strategies for repairing the injured spinal cord: the role of stem cells

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Abstract

Thanks to advances in the stem cell biology of the central nervous system, the previously unconceivable regeneration of the damaged spinal cord is approaching reality. A number of potential strategies aim to optimize functional recovery after spinal cord injury. They include minimizing the progression of secondary injury, manipulating the inhibitory environment of the spinal cord, replacing lost tissue with transplanted cells or peripheral nerve grafts, remyelinating denuded axons and maximizing the intrinsic regenerative potential of endogenous progenitor cells. We review the application of stem cell transplantation to the spinal cord, emphasizing the use of embryonic stem cells for remyelinating damaged axons. Recent advancements in neural injury and repair, and the progress towards development of neuroprotective and regenerative interventions are discussed.