

Stem Cell Neuroprotection

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The potential use of stem cell therapy for glaucoma is a topic of much current interest. A variety of potential stem or progenitor cell sources, each with inherent strengths and weaknesses, are available for transplantation-based therapies. In order to cure glaucoma completely, stem cell therapy would necessarily replace degenerated retinal neurons and re-establish the visual pathway. Such complete RGC replacement remains a formidable challenge. However, it is also possible that the survival and partial integration of transplanted cells within the retina may provide alternative benefits by enhancing the survival and function of host RGCs. We have shown that oligodendrocyte precursor cells and other types of stem cell can mediate enhanced RGC survival in glaucoma models. The mechanism of the protective effect is incompletely understood but appears to involve release of neurotrophic factors by transplanted cells. The effect of stem cell transplantation on retinal function in glaucoma requires further investigation before clinical trials can be contemplated.