

DELIVERY STRATEGIES FOR NEUROTROPHIN DELIVERY INTO THE INNER EAR FOR SGN PROTECTION FOLLOWING DEAFNESS.

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Loss of hair cells following sensorineural hearing loss (SNHL) sets in place degenerative changes within the cochlea including loss of spiral ganglion neurons (SGNs) that has implications for the efficacy of cochlear implants. Exogenous neurotrophins (NT) rescue SGNs from degeneration following a SNHL, however NT administration must be continuous to ensure long-term SGN survival. This has important implications for the safe clinical delivery of these drugs. Potential drug delivery strategies include the use of pumps; the transfer of NT gene(s) into cells within the cochlea; NT release from polymers and nanoparticles; and the use of cell-based therapies. In addition, since greater SGN rescue is observed when NT administration is combined with chronic electrical stimulation (ES), we examine whether chronic ES can maintain SGN survival long after cessation of NT delivery. The implications of this work in relation to the safe clinical application of NTs within the deafened cochlea are discussed.

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