Induction of axonal regeneration in neurodegenerative disease utilizing viral transduction

Neurodegenerative conditions such as Parkinson’s Disease, Huntington’s Disease, and Alzheimer’s Disease are devastating neurological diseases which have a high rate of prevalence and effect millions of people worldwide. They are associated with significant and progressive decline in cognitive and motor function secondary to neurodegeneration. Current therapies for such diseases are unable to halt or reverse this associated neurodegeneration and instead focus on neurotransmitter signaling, as in the case of L-Dopa in Parkinson's Disease. In addition to many adverse effects of these therapies, including dyskinesias and cognitive impairment, deterioration of neuronal function continues to progress, and functional deficits are not repaired. In contrast, this technology seeks to promote regeneration of neuronal axons, thereby reversing deficits of motor and cognitive function. Regeneration of damaged neurons presents a viable therapeutic method, restoring function by promoting cell growth.

Constitutively active p70S6K induces axonal regeneration within cells damaged in neurodegenerative disorders.

The p70S6K gene has been discovered to induce axonal growth when in a constitutively active state. In order to simulate Parkinson’s disease in a mouse model, the Substantia Nigra (SN) was lesioned. Constitutively active p70S6K was introduced into the SN utilizing viral vector induction three weeks after lesioning. These mice showed significant axonal regeneration in this area 12 weeks following introduction of the constitutively active p70S6K gene.

Applications • Treatment of neurodegenerative disorders such as Parkinson’s, Alzheimer’s, and Huntington’s disease • Potential for axonal regeneration in ischemic, infectious, or traumatic neuron damage

Advantages • Stimulates direct regeneration of the axons of damaged neurons • Avoids potential adverse effects of exogenous neurotransmitter delivery

Patent information:

Patent Pending

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