

# Parkinson's Disease and Stem Cells Research

## Stem Cells for the Future Treatment of Parkinson's Disease

Parkinson's disease (PD) is a very common neurodegenerative disorder that affects more than 2% of the population over 65 years of age. PD is caused by a progressive degeneration and loss of dopamine (DA)-producing neurons, which leads to tremor, rigidity, and hypokinesia (abnormally decreased mobility). It is thought that PD may be the first disease to be amenable to treatment using stem cell transplantation. Factors that support this notion include the knowledge of the specific cell type (DA neurons) needed to relieve the symptoms of the disease. In addition, several laboratories have been successful in developing methods to induce embryonic stem cells to differentiate into cells with many of the functions of DA neurons.

In a recent study, scientists directed mouse embryonic stem cells to differentiate into DA neurons by introducing the gene *Nurr1*. When transplanted into the brains of a rat model of PD, these stem cell-derived DA neurons reinnervated the brains of the rat Parkinson model, released dopamine and improved motor function.

Regarding human stem cell therapy, scientists are developing a number of strategies for producing dopamine neurons from human stem cells in the laboratory for transplantation into humans with Parkinson's disease. The successful generation of an unlimited supply of dopamine neurons could make neurotransplantation widely available for Parkinson's patients at some point in the future.