

Stem cell therapies: Targeting the non-motor symptoms

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Institution**Funder**

Parkinson's UK

Contact information of fellow**Country**

United Kingdom

Title of project/programme

Stem cell therapies: Targeting the non-motor symptoms

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Parkinson's UK

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The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

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Stem cell therapy | Behavioural psychology | Animal models

Research Abstract

Although it has been reported that the non-motor dysfunctions impact most heavily upon the quality of life for people with Parkinson's disease, there are currently no interventions available

to treat these aspects of the disease. Recent data has shown that human dopamine-rich fetal tissue grafts are capable of alleviating both motor and non-motor dysfunctions, such as impaired motivation and visuospatial deficits. The primary aim of this project is to investigate whether a more viable alternative, stem cells, are also capable of improving non-motor function. Three ES- or ItNES-derived cell lines differentiated into dopaminergic neurons will be studied. Human fetal ventral mesencephalic tissue will also be utilised as it represents the gold-standard for endogenous dopamine cells. The non-motor impairments that will be studied include executive dysfunction, working memory, motivation, visuospatial function, olfactory deficits, anxiety, sensitivity to apomorphine, habitual and goal-directed behaviours. Three models of Parkinson's disease will be employed (two modelling dopamine loss, one with overexpression of human mutant alpha-synuclein) in order to more precisely dissociate the ability of stem cell therapies to alleviate 1. pure dopamine-dependent dysfunctions, 2. dopamine-dependent dysfunctions in the presence of striatal neuropathology caused by alpha-synuclein accumulation and 3. impairments directly caused by overexpression of alpha-synuclein along the nigrostriatal pathway. Preliminary data demonstrates survival and recovery of motor function after transplantation of the ES- and ItNES-cell lines, paving the way for a more comprehensive analysis of the ability of these cells to improve both motor and non-motor dysfunctions.

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