Using shape memory scaffolds to increase transplant survival and prepare a nigro/striatal bridge

https://neurodegenerationresearch.eu/survey/using-shape-memory-scaffolds-to-increase-transplant-survival-and-prepare-a-nigrostriatal-bridge/

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Country

United Kingdom

Title of project or programme

Using shape memory scaffolds to increase transplant survival and prepare a nigro/striatal bridge

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Parkinson's UK

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€ 39,100

Start date of award

01/05/2015

Total duration of award in years

1.5

Keywords
Research Abstract
Cell transplantation to replace the dopaminergic neurons lost in Parkinson’s (either foetal cells, or stem cells) can improve function in individuals. This project addresses two problems that hinder the progress of cell transplantation therapies: poor graft survival, and inappropriate graft positioning. Survival of transplanted ventral mesencephalon (VM) cells and their stem cell derived counterparts is generally poor, requiring implantation of multiple foetuses or the preparation of large numbers of stem cell-derived neurons. Moreover, the ability of grafted cells

to extend projections away from the graft is limited, so transplants placement is into the striatum (target region), rather than the substantia nigra where the dopaminergic cell bodies normally reside.
Two materials, of the same composition but differing shape, will be investigated. The first, spherical porus hydrogel scaffolds, will be used to provide a substrate for VM cells to adhere to prior to transplantation. This is hypothesised to improve graft survival by reducing the stressful events immediately before and after transplantation. Cell viability post transplantation will be compared to cells transplanted in standard media, along with analysis of the host response to the material. The second, an elongated injectable, shape memory, hydrogel scaffold with a porous structure will be assessed in vitro for its capacity to load growth factors and support neurite extension. This elongated material is designed with a view to becoming a material bridge between the substantia nigra and striatum. This would be the first shape memory material to be cell loaded and delivered to the rodent brain.

Further information available at:

Types:
Investments < €500k

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United Kingdom

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