

# Improving the way we replace the nerve cells lost in Parkinson's



## Project information

Lead researcher	Prof Anne Rosser
Location	Cardiff University
Cost	£184,787 over three years
Start date	August 2011
Type of project	Project Grant
Project code	G-1105

## Project background

We don't know exactly why, but in people with Parkinson's dopamine-producing nerve cells in a part of the brain called the substantia nigra start to die. Researchers have previously transplanted dopamine-producing nerve cells obtained from foetal brains into the brains of animal models of Parkinson's and also into people with Parkinson's. In some cases, an improvement in the Parkinson's symptoms was seen, but the lack of a regular supply of foetal brain tissue means that this type of therapy won't become routinely available. Embryonic stem (ES) cells could provide a source of nerve cells for transplantation, but studies in animal models have shown that these nerve cells don't survive as well as those obtained from foetal tissue, nor do they improve the symptoms of Parkinson's. Prof Rosser suggests that this could be due a lack of another cell type known as astrocytes.

- **Embryonic stem (ES) cells** are derived from embryos that have been created in the test tube by *in vitro* fertilisation and are no longer required for fertility treatment. They have the potential to give rise to all cell types found in the body. This means they could

one day be used to replace the dopamine-producing nerve cells that die in the brains of people with Parkinson's.

- **Astrocytes are like 'helper' cells and are found throughout the brain.** They fill the space between nerve cells and act like a support. They play an important role in helping the nerve cells to work and survive. These cells are present in the foetal tissue transplants, but they are missing from ES cell transplants.

### What the researchers are doing

Prof Rosser and her team will test whether astrocytes are necessary for the survival of transplanted nerve cells. They will look at how astrocytes and dopamine-producing nerve cells obtained from both foetal tissue and ES cells interact using a rat model of Parkinson's. They plan to examine whether removing astrocytes from the foetal transplants reduces how well they work and survive, as well as investigating whether ES cell-derived transplants can be 'rescued' by adding astrocytes from other sources.

### How the research will help people with Parkinson's

Stem cell transplants have great potential as a future cure for Parkinson's. But before they can be successfully used as a therapy we need to ensure that the cells survive and work correctly after transplantation. So the information gained from this study will be an important step in bringing stem cells closer to being useful for clinical trials in Parkinson's.

Prof Rosser is also actively involved in the forthcoming TRANSEURO clinical trial. This is a new international five-year clinical study into developing a cell replacement therapy for Parkinson's. Read more about this study on page 30 of the winter 2010 edition of *Progress*.

### For more information, please talk to the Research Team

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