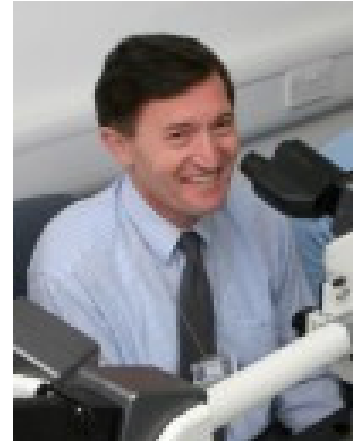


How does Parkinson's spread throughout the brain?



Project information

Lead researcher	Prof Tamas Revesz
Location	Institute of Neurology, London
Cost	£319,334 over 3 years
Start date	November 2010
Type of project	Project grant
Project code	G-1004

Project background

Parkinson's develops when a tiny part of the brain, called the substantia nigra, stops making a chemical called dopamine. We don't yet know why, but the nerve cells that produce dopamine begin to die. However, the death of the nerve cells continues very slowly and it is only when around 70% of these cells have died, that the motor symptoms of Parkinson's appear.

As the condition progresses, it also spreads to affect other parts of the brain, which gives rise to many other non-motor symptoms that people experience. These include memory problems, depression, sleep abnormalities and digestive problems. Many studies have attempted to understand the cause of Parkinson's and how nerve cells in the brain die. This project will study how the death of nerve cells spreads throughout the brain and whether we may be able to develop ways to prevent this from happening.

- **Lewy bodies** are sticky clumps of protein that are found inside the brains of people with Parkinson's. They form inside nerve cells that produce the chemical dopamine and these cells then die some time after the Lewy bodies appear. So we can use these to predict which cells are going to die.

- **The pattern in which Parkinson's spreads within the areas of the brain is relatively well defined.** This is termed the Braak staging system. According to this, the death of nerve cells in one part of the brain spreads to kill nerve cells in another region that is usually in physical contact with the nerve cells that die.
- **Studies on the transplantation of brain tissue** to treat Parkinson's showed that Lewy bodies were found in the transplanted nerve cells. This suggested that the death of the nerve cells had in some way 'spread' from the brain into the transplanted nerves.

What the researchers are doing

Prof Revesz and his research team have several questions they're aiming to answer in this project. Brain regions that are predicted to be affected by Parkinson's will be studied biochemically to look for differences in the levels of individual proteins that may be involved in the early stages of the condition. They will examine specific parts of the brain which are ultimately affected by Parkinson's. But they will do this even before Lewy bodies appear. This will allow them to identify the very first changes that occur early as a result of the spread of nerve cell death, rather than the changes that occur later on after they have died. The project will use post mortem human brain tissue that has been donated for research.

How the research will help people with Parkinson's

This research will help us to pinpoint ways by which the death of nerve can spread throughout the brain in Parkinson's. Armed with this knowledge, we may be able generate new treatment strategies that could prevent the progression and spread of Parkinson's and thus halt the condition in its tracks.

For more information, please talk to the Research Team

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