

Can reducing inflammation protect dopamine nerve cells?



Peter

Project information

Lead researcher	Dr Peter Teismann
Location	University of Aberdeen, University of Göttingen
Cost	£34,989
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Type of project	Innovation
Project code	K-1001

Project background

In most cases of Parkinson's – around 95% – we don't know why people develop the condition. What we do know is that nerve cells in a specific part of the brain begin to die. These cells contain the chemical dopamine which is important for controlling voluntary movement. Without these cells, people develop the main symptoms of tremor, rigidity and slowed movement. Although a drug treatment called levodopa can help the brain replace dopamine, the side-effects of the drug can eventually become as bad as Parkinson's itself. So we desperately need to develop new treatments that can slow the condition down or even stop the nerve cells from dying in the first place. Dr Teismann's research team are working on a new treatment that targets inflammation in the brain.

- **Inflammation is one of the body's natural defences.** We have probably all experienced temporary redness or swelling around a cut or insect bite or after an infection. This inflammation is caused by a complex series of events that helps the body to repair or remove damaged cells so that it can heal.
- **Long-term inflammation can cause damage to cells instead of healing them.** We don't yet understand everything about the chemical 'pathways' (that is, sequences of

events inside cells) involved in inflammation. But we do know that inflammation can sometimes lead to conditions such as rheumatoid arthritis or even Alzheimer's and multiple sclerosis, which affect nerve cells in the brain.

- **Inflammation may be involved in Parkinson's.** Recent research has shown that people who take the drug Ibuprofen regularly are less likely to develop Parkinson's than people who don't take it or people who take other anti-inflammatory drugs such as aspirin. This tells us that inflammation may play a part in Parkinson's but it doesn't tell us which specific chemical pathways inside nerve cells are involved.

What the researchers are doing

Previous work by Dr Teismann and his research team has found that a toxic chemical which causes some of the symptoms of Parkinson's in animals also increases the activity of a chemical pathway that's known to be involved in inflammation. However, the team has also discovered a specific combination of other chemicals that can protect dopamine nerve cells from dying. And interestingly, they may do this by reducing the inflammatory activity. So they're working on developing a drug that can halt Parkinson's based on this chemical combination. However, a drug that completely prevented inflammation wouldn't necessarily make the best treatment, because we often need the good effects that inflammation can have to help us recover from infection. So the team will use this project to alter the chemical combination in different ways and test them first on nerve cells in a lab dish and then in an animal model of Parkinson's. They want to find out which combinations keep the nerve cell protected but allow helpful inflammation to continue.

How the research will help people with Parkinson's

At the end of the project we will know more about how inflammation affects the nerve cells that die in Parkinson's. We may also have a completely new target for developing a drug that can slow or stop the nerve cells from dying.

For more information, please talk to the Research Team

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