

Can alpha-synuclein help us diagnose Parkinson's earlier?



Project information

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| Lead researcher | Dr Bazbek Davletov |
| Location | University of Cambridge |
| Cost | £99,946 over 2 years |
| Start date | June 2009 |
| Type of project | Project grant |
| Project code | G-0903 |

Project background

We don't yet know why the dopamine-producing nerve cells involved in voluntary movement begin to die in people with Parkinson's. But one suggestion is that there are changes to the way that dopamine is used by the cells. Dopamine is a chemical that's important to the way that the nerve cells communicate with each other. And previous research has shown that the amount of dopamine used by the cells gets smaller before the cells start to die. So it's possible that this is an early sign of Parkinson's.

There are a couple of promising leads that might tell us more about what happens to dopamine inside the nerve cells before Parkinson's symptoms develop.

- **A protein called alpha-synuclein is known to be involved in Parkinson's.** It's found inside all brains but we don't yet know much about what it does. We do know that it makes up the main part of clumps of protein called Lewy bodies that are found inside dying dopamine nerve cells. And we also know that genetic mutations in alpha-synuclein can lead to Parkinson's.

- **Other proteins called SNAREs affect dopamine use by nerve cells.** SNAREs help to control the way dopamine is released from nerve cells as the cells send signals to each other.
- **Alpha-synuclein can change how SNAREs work.** Recent research has shown that alpha-synuclein can affect SNAREs but we don't yet know how they do it. One possible way is via fat-like molecules called lipids that are also affected by alpha-synuclein.

What the researchers are doing

In this project, Dr Davletov and his research team are investigating whether alpha-synuclein can affect the amount of dopamine that nerve-cells use, and whether this is because it changes the way that lipids and SNAREs work together. They're also trying to find out what this might mean for dopamine-producing nerve cells in order to find out more about why the cells die in Parkinson's. This is the first research study to test the idea.

How the research will help people with Parkinson's

Research in animals has shown that nerve cells can begin using less dopamine before they start to die and before any symptoms of Parkinson's start to show. This study will give us more information about what alpha-synuclein does inside dopamine-producing nerve cells. It could also give us new clues to understanding the very earliest stages of Parkinson's. If so, this could lead the way toward earlier diagnosis and treatment, or to a cure.

For more information, please talk to the Research Team

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