

Using fruit flies to study the visual problems of Parkinson's



Project information	
Lead researcher	Dr Christopher Elliot
Location	University of York
Cost	£33,587 over six months
Start date	October 2010
Type of project	Innovation grant
Project code	K-1007

Project background

Although Parkinson's is often seen as a movement disorder, many people experience eye trouble including difficulty reading, dry eyes and even hallucinations. But we don't fully understand why these vision changes occur or how they relate to the changes in the brain that cause the movement symptoms of Parkinson's.

In this project Chris will investigate how a gene known to cause inherited Parkinson's affects vision in fruit flies.

- **Fruit flies can tell us a lot about human genetics and how nerve cells work.** In particular, the eyes of a fly are simple and fairly easy to study. We understand how their visual system works and how to measure changes in vision accurately, easily and quickly.
- **Nerve cells in the eye produce the chemical dopamine.** This is the same chemical that is used by the nerve cells that die in Parkinson's, which are found in the part of the brain that controls movement. Interestingly, in both fruit flies and humans, dopamine seems to play a role in adapting the eye to bright light.

- **Do the genes involved in Parkinson's affect the visual system too?** Changes in three genes involved in inherited Parkinson's also damage the fruit fly visual system. LRRK2 is both the most common gene behind inherited Parkinson's and is found naturally in the fly, so it's the ideal gene to study.

What the researchers are doing

Chris and his team will study fruit flies that carry a version of the LRRK2 gene that causes Parkinson's. They will record the electrical signalling of nerve cells inside the eye as the fruit flies develop problems with vision. This will help them to identify which cells are affected. They will then look more closely at these cells and compare them to the dopamine-producing nerve cells lost inside the brain in Parkinson's.

The team will also use their fruit flies to screen for drugs. They will test whether drugs designed to block the effects of Parkinson's-related genes can actually prevent the development of visual problems in the fruit flies.

How the research will help people with Parkinson's

This project will provide new insights into changes in the visual system in Parkinson's. And Chris hopes that evidence from this project will help him set up larger, in-depth studies using fruit flies to develop and test new drugs for Parkinson's.

In the shorter term, this study will help to improve our understanding of the visual problems that can affect people with Parkinson's. And in the longer term, this innovative study may lead to better drug testing and treatments that target the root causes of Parkinson's.

For more information, please talk to the Research Team

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