

News

Parkinson's linked to faulty immune cells

Oliver Moody Science Correspondent

Parkinson's disease is a consequence of patients' immune systems going haywire and attacking brain cells, according to a study that casts the condition in a different light and raises the prospect of new treatments.

More than 125,000 people in the UK have the disorder, which breaks down the brain's apparatus for making dopamine, a vital signalling chemical. Its effects include tremors, muscle stiffness, depression and mild cognitive impairment. There is no cure at present.

The US findings suggest that Parkinson's is the result of an identity crisis among the immune cells that normally weed out infections. This implies that researchers may be able to treat the disorder if they can find the right drug to dispel the confusion. It also points to the possibility of a blood test that could catch Parkinson's in its early stages.

As we age, brain cells slowly lose their ability to rinse out their leftover proteins. The accumulation of one of these proteins, alpha-synuclein, is a hallmark of Parkinson's, although exactly what it does remains unclear.

Neuroscientists at Columbia University in New York and La Jolla Institute for Allergy and Immunology in California have found the first strong evidence that a dysfunctional immune system can chop the protein up and serve it to the body's disease-killing cells as though it were an unwelcome

bacterium or virus. They took blood samples from 67 people with Parkinson's and 36 healthy people and mixed in fragments of alpha-synuclein. The healthy participants' T-cells — the cleaners of the immune system — mostly left the bits of protein alone, while the T-cells of a large minority of the Parkinson's group began mopping it up with gusto. The results are published in the journal *Nature*.

The alpha-synuclein builds up in a brain region called the substantia nigra, which manufactures dopamine, an essential chemical for carrying reward and movement messages.

First the excess protein switches on one kind of immune cell, the microglia, which tell the brain cells to begin cladding themselves in fragments of alpha-synuclein as a warning that something is going wrong. This prompts the T-cells to break down the substantia nigra, depriving the brain of dopamine.

David Sulzer, professor of neurobiology at Columbia, said this meant that scientists could try to curb Parkinson's by turning down the immune response and encouraging brain cells to flush out their alpha-synuclein in the first place.

Daniel Altmann, professor of immunology at Imperial College London and spokesman for the British Society of Immunology, said there were drugs to deal with this process in autoimmune conditions such as multiple sclerosis, but whether the approach would work in Parkinson's was another question.