Hitting cell hot spot could help thwart Parkinson's disease

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The latest work to 'turn off the taps' in the brain and stop a chemical being released in excess amounts - which can lead to Parkinson's Disease - will be presented at The British Pharmacological Society's Summer Meeting in Edinburgh today (Wednesday, 8 July 2009).

Dr Susan Duty from King's College London will present her latest work, aimed at stimulating 'trigger points' to stop the release of a chemical that can kill brain cells, at a special symposium that focuses on research into new types of drugs for treating disorders of the central nervous system.

Parkinson's disease is a degenerative brain disorder that is triggered by death or degeneration of nerve cells in a part of the brain called substantia nigra. This brain region is essential in maintaining normal movement so when the cells start to die off, patients lose ability to properly execute and control movements.

Dr Duty is aiming to find a way to slow down, stop or, even better, reverse the cell death process.

She says one of the contributing factors to nerve cell death is an excess of the chemical glutamate in the motor control pathways in the brain. An excess of this chemical changes the way these pathways operate and makes movement even less well controlled.

But more importantly, glutamate is one of the factors considered responsible for the demise of the brain cells.

At the symposium, which will be attended by leading UK and international pharmacologists, Dr Duty will be presenting her latest work on ways to stop glutamate being released.

Dr Duty said: "The way we hope to achieve this is by stimulating protein targets on the nerve cell called metabotropic glutamate receptors. Certain types of these receptors, when stimulated, are known to prevent release of glutamate in other brain regions. We, and others, have now taken these ideas into regions relevant to Parkinson's disease in the hope of reversing both the clinical signs and cell death associated with this condition."

Dr Duty says that current drugs can only treat the symptoms but not the underlying cause of the disease: "They provide relief of symptoms by replacing the chemical, dopamine, which the dying cells would normally secrete in order to maintain proper control of movement.

"However, they do little to combat the ongoing progressive cell death meaning that symptoms get worse, higher doses of drug are needed to control the worsening symptoms, the result being appearance of disabling side-effects such as involuntary flailing limb movements and painful twisting of joints.

"Given the disease is progressive in nature, the continued death of cells in the substantia nigra leads to gradual worsening of symptoms and decline in patients' quality of life over time. Finding drugs that can provide protection or repair to the dying cells - as well as relieve the clinical signs of Parkinson's - is therefore a key area of interest in this field."

Dr Duty and colleagues have recently published findings showing that stimulating certain classes of metabotropic glutamate receptor can reverse symptoms in a preclinical model of Parkinson's disease.

"More recently, we have identified which specific type of receptor is involved," she says. "By targeting specific receptors it is hoped that side-effects will be minimised as fewer targets elsewhere in the brain will be stimulated.

"We also have good evidence now that stimulating these receptors can provide protection to the dopamine-containing nerve cells in preclinical models of Parkinson's disease and that the protected nerve cells function normally and are able to help restore movement control."

The BPS Summer Meeting will be held at The University of Edinburgh from Wednesday 8 to Friday 10 July 2009.

It brings together leading pharmacologists from the UK, Europe and beyond, with presentations on the latest pharmacological developments to tackle a range of conditions, including respiratory disease, Alzheimer's, Parkinson's, stroke and atherosclerosis.

Dr Duty will give a presentation - 'Group III metabotropic glutamate receptors (mGluRs) as potential targets for the treatment of Parkinson's disease' - at a symposium entitled 'Metabotropic glutamate receptors: advancing novel drugs for treating CNS disorders' on Wednesday 8 July 2009.

Source: University of Manchester (news : web)