

**FEDERATION OF EUROPEAN NEUROSCIENCE SOCIETIES**

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**PRESS RELEASE**

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**NEW USE FOR AN OLD DRUG: AN ANTIBIOTIC MAY  
HELP PARKINSON'S DEMENTIA**

Parkinson's disease is associated mainly with movement disorders. But many patients also develop emotional and cognitive conditions, including dementia. Currently, there is no medication that prevents or cures Parkinson's disease dementia. But scientists in Taiwan have found a specific antibiotic that may shed light on treatment of this neurodegenerative dementia.

Presenting his research today (5 July) at the FENS Forum of Neuroscience in Copenhagen, **Professor Ying-Jui Ho** described findings that the antibiotic ceftriaxone, regularly used to treat bacterial infections such as meningitis, pneumonia, and gonorrhoea, may offer an innovative treatment strategy for this form of dementia.

Professor Ho from Chung Shan Medical University, in collaboration with colleagues in Taiwan and Russia, conducted animal studies using ceftriaxone to treat Parkinson's disease dementia. They used manganese-enhanced magnetic resonance imaging (MEMRI), a method used to understand information-processing in central nervous system pathways, to measure brain cell activity.

The researchers found that ceftriaxone not only relieved motor symptoms of Parkinson's disease, but also prevented neurodegeneration and improved cognitive function.

Specifically, ceftriaxone prevented various types of neuronal changes associated with Parkinson's disease dementia. The drug inhibits inflammation in the substantia nigra - a mid-brain area which controls voluntary movement, produces the neurotransmitter dopamine, and regulates mood. Ceftriaxone also inhibits neurodegeneration of specific cells in the hippocampus, a brain area important in memory formation, and associated with cognitive impairment in dementia.

Professor Ho and colleagues also found that ceftriaxone may enhance neurogenesis, the process in which new brain cells are generated - in this case replacing new cells in damaged brain areas, restoring neural activity, and improving cognitive function (including working memory, recognition, and visual space function).

"To our knowledge, this is the first study showing that ceftriaxone prevents loss of neuronal activity and may enhance neurogenesis in the brain. Ceftriaxone's neuroprotective effects have implications not only for Parkinson's disease dementia, but may also shed light on treatment of neurodegenerative diseases in general," said Professor Ho.

Professor Ho mentioned that the research also indicates that MEMRI imaging may be a useful indicator for the severity of Parkinson's disease, and for judging the effect of treatment.

It is estimated that seven to 10 million people worldwide are living with Parkinson's disease\*. With populations ageing, dementia and neurodegenerative diseases have received increasing attention. Since there are no cures, much research focuses on treatments to alleviate symptoms, improve cognitive function and well-being, and avoid drug-induced side effects.

Professor Ho pointed out that the current drug most regularly used to treat Parkinson's disease dementia, rivastigmine (originally used to treat Alzheimer's disease), can also cause gastrointestinal side effects such as nausea, vomiting, and aggravate the tremor experienced by Parkinson's disease patients. But as ceftriaxone is a generic drug, it could be promptly applied in clinical treatment, he said.

**END**

**Abstract Reference** 1992-C02d

**Poster** Relationships between neuronal activity and density after ceftriaxone treatment in a Parkinson's disease rat model: an immunohistochemical and MRI study)

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**NOTES TO EDITORS**

It is estimated that seven to 10 million people worldwide are living with Parkinson's disease  
Parkinson's Disease Foundation [http://www.pdf.org/en/parkinson\\_statistics](http://www.pdf.org/en/parkinson_statistics)

**The 10th FENS Forum of Neuroscience**, the largest basic neuroscience meeting in Europe, organised by FENS and hosted by the Danish Society for Neuroscience will attract an estimated 6000 international delegates. FENS mission is to advance research and education in neuroscience within and outside Europe, to facilitate interaction and coordination between its members. FENS represents 43 national and single discipline neuroscience societies with about 24,000 member scientists from 33 European countries. <http://www.fens.org/>

**Further Reading**

Ceftriaxone prevents the neurodegeneration and decreased neurogenesis seen in a Parkinson's disease rat model: An immunohistochemical and MRI study. Weng JC, Tikhonova, Chen JH, Shen MS, Meng WY, Chang YT, Chen KH, Liang KC, Hung CS, Amstislavskaya TG, Ho YJ *Behavioural Brain Research*. May 152016;305:126-39.  
doi: 10.1016/j.bbr.2016.02.034. Epub 2016 Mar 3.