RXR activation -- hope for new Parkinson's disease treatment

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Following up on their previous work showing the rescue of dopamine neurons by chemicals that interact with the retinoid X receptor (RXR), researchers have now investigated the potential of these chemicals, known as RXR ligands, for the treatment of Parkinson's disease. Writing in the open access journal *BMC Neuroscience* the scientists describe the use of two cellular models of Parkinsonian damage to explore the neuroprotective function of the two RXR ligands LG268 and XCT.

Susanna Kjellander worked with a team of researchers from the Ludwig Institute for Cancer Research, Sweden, to test both the ligands and a novel neuronal platform. She said, "Nuclear hormone receptors like RXR and the Nurr1-RXR receptor heterodimer are emerging as interesting factors in Parkinson's research. It is unclear exactly how neurons are damaged in Parkinson's disease, but it is suggested that oxidative damage and energy depletion in the brain are involved. By activating RXR, neurons can be rescued from this degeneration".

The researchers used two different dopaminergic cell systems as models of Parkinson's disease. First, they were able to mimic some of the conditions that may be present in people with the disease by applying a neurotoxin to primary neurons derived from the rat ventral midbrain. They found that the two RXR-activating ligands studied were able to selectively protect dopaminergic neurons from the stress induced in this model. The results were then confirmed in a novel system in which dopaminergic neurons generated from mouse embryonic stem cells were treated with the neurotoxin. They conclude, "The regulation of RXR

activity holds promise to contribute to a novel, alternative strategy to treat Parkinson's disease".

More information: Activation of Retinoid X Receptor increases dopamine cell survival in models for Parkinson's disease, Stina Friling, Maria Bergsland and Susanna Kjellander, *BMC Neuroscience* (in press), www.biomedcentral.com/bmcneurosci/

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