

Noninvasive stimulation of the brain dopamine system: A study combining neuromodulation to multimodal neuroimaging

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Finland

Title of project/programme

Noninvasive stimulation of the brain dopamine system: A study combining neuromodulation to multimodal neuroimaging

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Neurodegenerative disease in general

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Research Abstract

The overall goal of this project is to identify potential new treatment strategies for dopamine-dependent brain disorders, such as Parkinson's disease and addictions. Transcranial magnetic stimulation (TMS) is a method that can be used to activate or inhibit neuronal networks in the brain. However, to date, it is not known if TMS could be used to accurately modify brain dopamine function in cognitive brain networks. In this study, state-of-the-art brain imaging methods are applied to identify specific brain networks, which are activated using TMS in order to increase brain dopamine function. The method is first validated at Harvard University and then applied to Parkinson's disease patients at University of Turku. Possibility to modulate specific dopaminergic networks noninvasively would have major implications in cognitive neuroscience, opening new avenues for treatment of Parkinson's disease and many other neuropsychiatric disorders related to abnormal dopamine neurotransmission.

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