

An investigation into the neurocomputational role of brain oscillations in human motor control for health and disease.

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Name of Fellow

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Institution Funder

Wellcome Trust

Contact information of fellow Country

United Kingdom

Title of project/programme

An investigation into the neurocomputational role of brain oscillations in human motor control for health and disease.

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01/02/15

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4.0

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

Research Abstract

The role of brain oscillations in health and disease remains undetermined. I aim to understand how oscillations influence the human motor system, contribute to Parkinson's disease (PD) and can be modulated for therapeutic effect using novel adaptive deep brain stimulation (DBS) techniques. Beta oscillations (12-30Hz) have been proposed to carry movement-relevant information in health and be abnormal in PD. Their precise function however is unknown. I will investigate this by examining the specific role of beta oscillations during action selection and execution using high precision magnetoencephalography (MEG) in healthy subjects and electrocorticography (ECoG) in PD. Next, I will causally test these relationships using a technique I have developed that can selectively cancel beta through the precise temporal delivery of DBS. Finally, I will test prolonged disruption of beta in PD to determine how dysfunction in action selection/execution mediates motor symptoms and whether re-tuning the beta network can lead to long-lasting improvements in motor function by reducing excessive cortico-subcortical connectivity. This will validate a novel method for investigating oscillatory neural networks using subcortical stimulation but additionally advance a new principled neurostimulation approach to disease that could be applied to understand and treat a range of neuropsychiatric disorders.

Types:

Fellowships

Member States:

United Kingdom

Diseases:

Parkinson's disease & PD-related disorders

Years:

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