

Doelgroep: gezonde proefpersonen

Project title	Tuning breaks
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Co-investigators + Institutes	
Study period	2019-2024
Status of the project	Data collection
Funding	EU - Individual Marie Curie Fellowship
Link to study website	
Neuromodulation technique	tACS
Hardware	kinematics, EEG
Species	Human
Research question(s)	<p>Inhibitory control over unwanted thoughts, emotions and movements is essential for effective interaction with our environment. This becomes particularly evident when there is too little inhibition, as in obsessive-compulsive disorder or Tourette's syndrome, or too much, as in Parkinson's disease. Recent evidence links successful inhibition to the power of neural oscillations in the beta band (15-30Hz) in a circuit involving parts of the frontal cortex and the subthalamic nucleus. While this is an important step forward, it is not yet sufficient to develop effective neuromodulatory treatments for inhibitory control disorders. For that, we need to understand how the beta oscillations mediate neuronal communication within the fronto-subthalamic circuit.</p> <p>In this project, I address this challenging question through novel applications of transcranial alternating current stimulation (tACS). This non-invasive brain stimulation (NIBS) technique aligns neuronal oscillations to an oscillating low-intensity electrical current applied to the brain. This external control over oscillatory power and phase will allow me to investigate: (1) the functional relevance of beta oscillatory phase, and (2) the causal role of interactions between beta oscillations and other frequency bands ('cross-frequency coupling'). Subsequently, I will develop an innovative, non-invasive, treatment strategy for inhibitory control deficits, by recording and modulating abnormal circuit activity only when present.</p>
Stimulation parameters	2mA
Stimulation target	pre-supplementary motor area
Primary outcome	stop signal task performance
Secondary outcome(s)	EEG beta power/phase