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**Prof. dr. Jacques De Keyser, Promoter**

Center for Neurosciences (C4N)  
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PhD in Medical Sciences  
2020-2021

INVITATION to the Public defence of

**Anja FLAMEZ**

To obtain the academic degree of '**DOCTOR OF MEDICAL SCIENCES**'

**Low frequency repetitive Transcranial Magnetic Stimulation  
for the treatment of dyskinesias in Parkinson's disease.**

The defence will take place on Thursday, 17<sup>th</sup> September 2020 at 5 p.m.

and will be organised online

via Zoom meeting, accessible through the following link:

[https://gf.vub.ac.be/redirects/PhD\\_defense\\_Anja\\_Flamez.php](https://gf.vub.ac.be/redirects/PhD_defense_Anja_Flamez.php)

and in Auditorium Piet Brouwer

**ADMITTANCE** to the auditorium will only be granted upon presentation of the personal invitation from the PhD candidate.

## Summary of the dissertation

In late stage Parkinson patients there is an unmet need for new treatments to adequately control dyskinesias, a long-term side effect of dopaminergic treatment. Low frequency repetitive transcranial stimulation (LF rTMS), a noninvasive stimulation technique, applied to motor cortical areas has in preliminary studies been used to treat dyskinesias with variable success. In our studies we examined the effect of one or multiple sham controlled LF rTMS session(s) applied to both motor cortices on dyskinesias, and one session to the right pre-supplementary motor area (pre-SMA) on dyskinesias, brain metabolism and functional connectivity. Although we did not observe a long-lasting effect on dyskinesias, we did observe a trend for improvement in the multiple session motor cortex protocol. Moreover, we demonstrated that one session of pre-SMA LF rTMS has an effect on pre-SMA metabolism dependent on disease duration, not dyskinesias. The shorter the disease duration, the stronger the observed effect, implying that some brain plasticity could still be present earlier on in the disease. Finally, we showed that one session of pre-SMA LF rTMS had different effects on functional connectivity with the ipsilateral putamen and the cerebellum depending on the dyskinesia state of the patient. We conclude that, although not very successful until now, rTMS is indeed a technique that merits to be further explored for the treatment of dyskinesias in late stage PD patients, using novel rTMS techniques and protocols, targeting prefrontal areas and the cerebellum.

## Curriculum Vitae

Anja Flamez was born on the 7<sup>th</sup> of July 1968. She is married to Tom Hanson and they have 3 sons, Georges, Victor and Cyril. She studied medicine at the Vrije Universiteit Brussel and graduated in 1994 summa cum laude. She trained to be a neurologist under the supervision of Prof. Em. Guy Ebinger and has been working as a full-time neurologist at the Neurology Department of the UZBrussel ever since, at present as Head of Clinic. From early on she has a special interest in movement disorders, particularly Parkinson's disease, and under her supervision in cooperation with the Neurosurgery department a center for Deep Brain Stimulation was initiated in 2002, offering surgical treatment for Parkinson's disease and Essential Tremor. The past decade she investigated the effect of noninvasive brain stimulation on levodopa induced dyskinesias in late stage Parkinson's disease resulting in the present PhD thesis.