

Technology Opportunity, Ref. No. UB-18/081

Faster and more efficient programming of deep brain stimulation electrodes

This method allows for considerably faster programming of directional deep brain stimulation (DBS)-electrodes for patients with Parkinson’s disease, thus substantially reducing the time-consuming manual procedure of optimal stimulation contact finding as presently applied in the clinic. Consequently patients with Parkinson’s disease could benefit earlier from the optimal stimulation treatment.

Keywords Neurology, Parkinson’s disease, deep brain stimulation, local field potential, directional leads, DBS programming

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Reference Tinkhauser et al.: Mov. Disord. 2018; 33:159-164.

Background DBS is a proven treatment option for patients in the advanced stages of Parkinson’s disease. Recently introduced directional DBS electrodes allow for a more individual adaptation of the stimulation field and hence have the potential to provide further clinical improvement. The current procedure for programming directional DBS-electrodes is however extremely time-consuming and exhausting, for both patients and physicians, thereby limiting the broader use of this powerful treatment.

Invention The invention uses local field potentials (“LFPs”) that can be directly recorded during implantation surgery (or potentially via sensing capable DBS devices) from the DBS target structure in the basal ganglia through the directional electrode itself. By applying the inventive algorithm, particular frequencies within LFP signals can be predictive for the optimal programming of the directional DBS electrode.

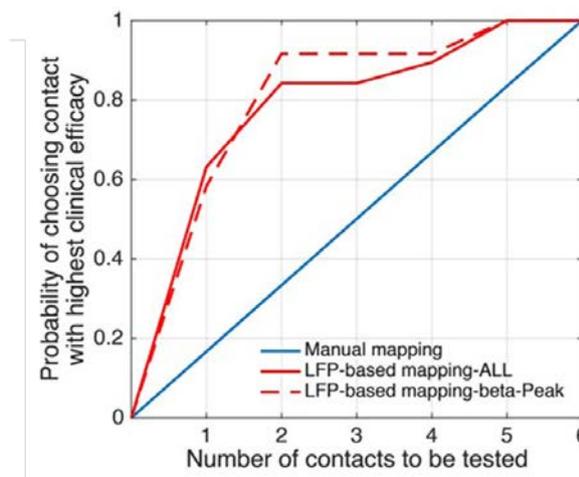


Figure: The LFP-based strategy to identify the most efficient stimulation contacts proves to be superior to the clinical standard of manual contact testing. (blue line: conventional manual test strategy; full red line: LFP-based test strategy; dashed red line: LFP-based test strategy for hemispheres with clear peak in the beta band in the DBS target structure). For further details see publication.

Fields of Use Treatment of Parkinson’s disease and potentially other neurological movement disorders.

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