# Impact of Functional Magnetic Resonance Neurofeedback on Brain Plasticity of Post-Stroke Neuropsychiatric Alterations

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## Introduction

There is an intricate link between post-stroke motor rehabilitation, cognitive and psychiatric deficits, with great impact on patients' prognosis. Its mechanisms, however, are poorly understood[1]. How does neurofeedback training focused on motor networks impact stroke rehabilitation? Since previous studies have shown that neurofeedback induces brain plasticity[2], it would be capable of promoting motor recovery? Do these effects impact non-motor brain networks?

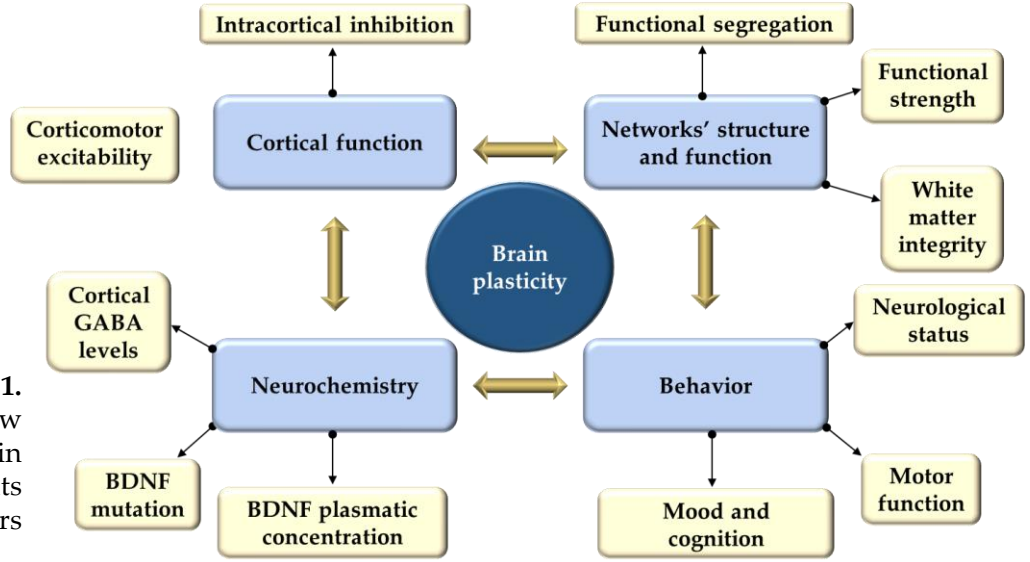


**Figure 1.** Schematic view of brain plasticity and its related factors

## Methods

- This is a double-blinded, sham-controlled clinical trial in progress.
- Forty post-stroke participants will be randomly assigned to compose the neurofeedback or the control (sham) group
- Motor, neuropsychological and psychiatric variables will be assessed.
- Imaging: fMRI, anatomical, functional and diffusion sequences.
- GABA Spectroscopy of primary motor cortex.
- Quantification of plasma levels of BDNF.
- Neurofeedback training (1 hour-long) targeting motor brain patterns.

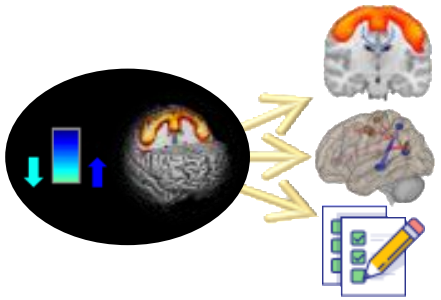

**Figure 2.** Examples of outcomes. Functional, structural and behavioral analysis will be performed.

## Expected Results

We hypothesize that NFB training promotes structural and functional brain changes that correlate with neuropsychiatric symptopms recovery. Due to the Covid-19 pandemics, the study has been delayed and is planned to be started on December 2021.

**References**
1. Ferro et al. Nature Reviews. 2016.
2. Marins et al. Neuroimage. 2019.