

# Factors that might influence the effect of CIMT

## GABA modulation

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# Background

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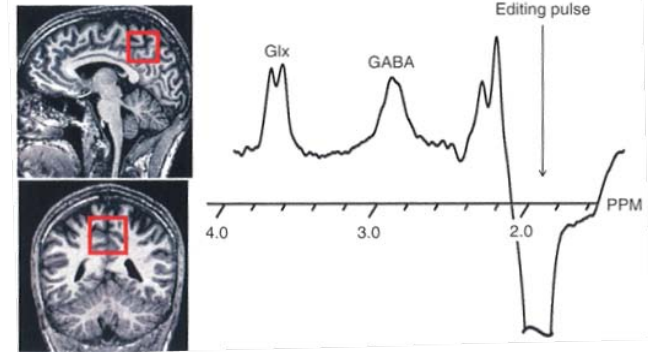
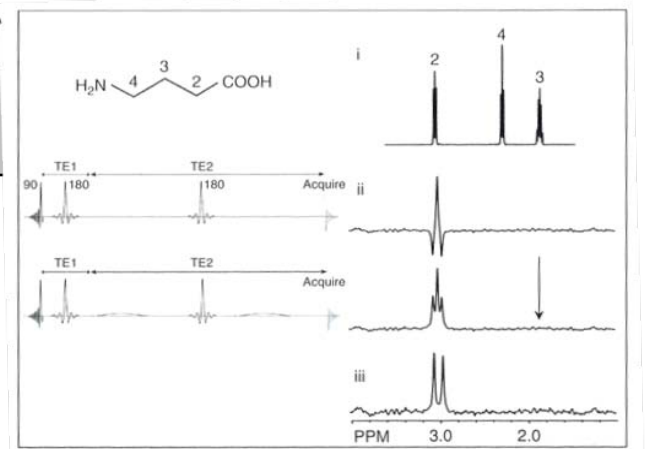
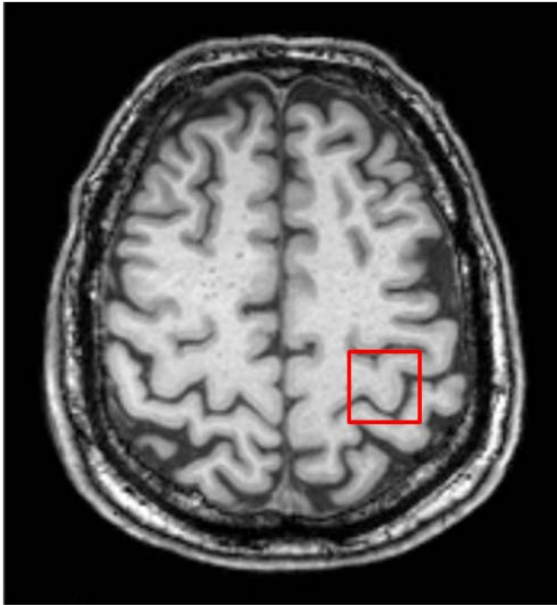
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- In healthy subjects practice-induced cortical reorganization is reduced by GABA agonists (Tegenthoff et al. 1999, Ziemann et al. 2001).
- Studies in post-stroke patients have shown both increases (Murase N et al. 2004) and decreases in inhibitory activity (Liepert J et al. 2000, Blicher JU et al. 2009)

# GABA MR spectroscopy

GABA edited Magnetic Resonance Spectroscopy (MRS)



Barker PB et al. 2010

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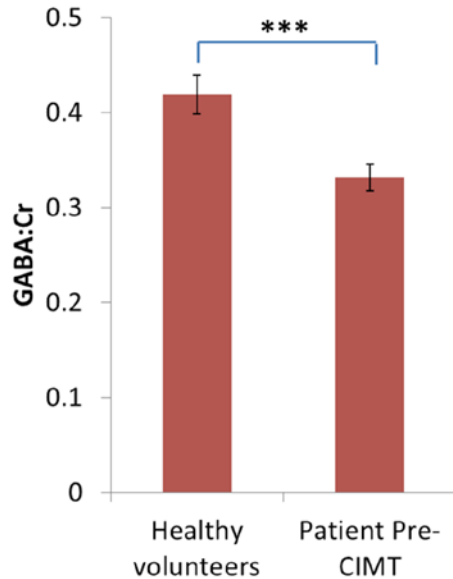
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- Motor function was measured using Wolf motor function test (WMFT).
- GABA MRS was performed pre- and post- CIMT.



# Results

## Baseline (pre-training)



\*\*\*  $p < 0.001$ , error bars SEM

1. GABA levels was lower in patients than healthy subjects, also after correcting for grey matter content in the scanned voxel

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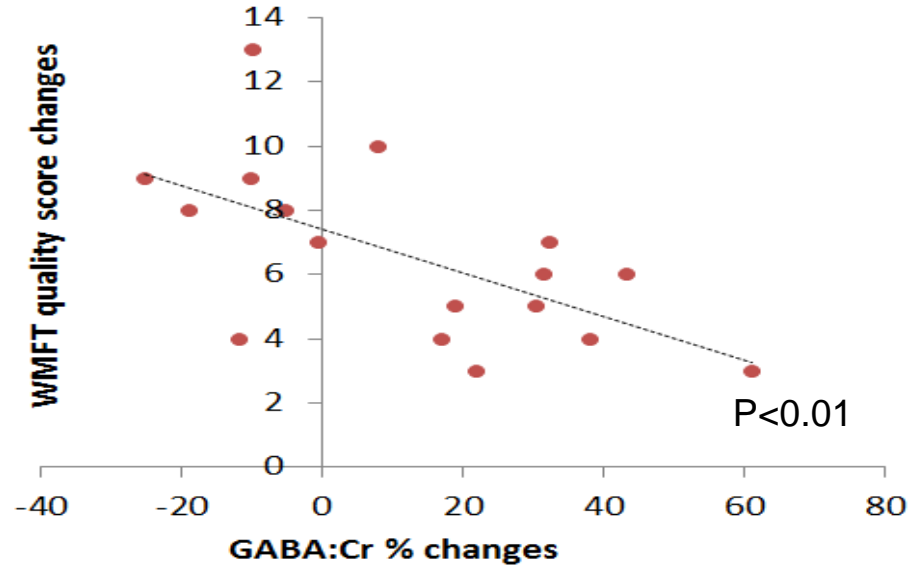
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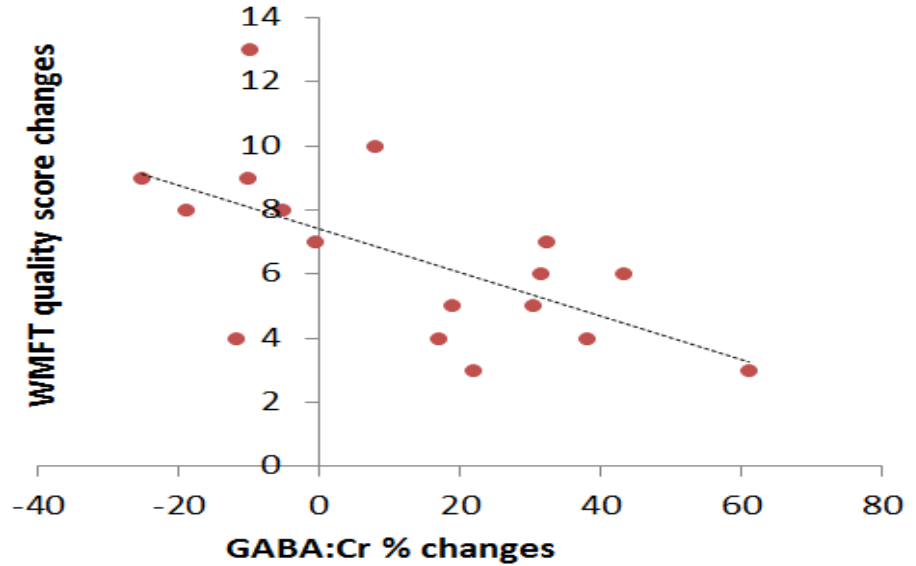
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# Discussion

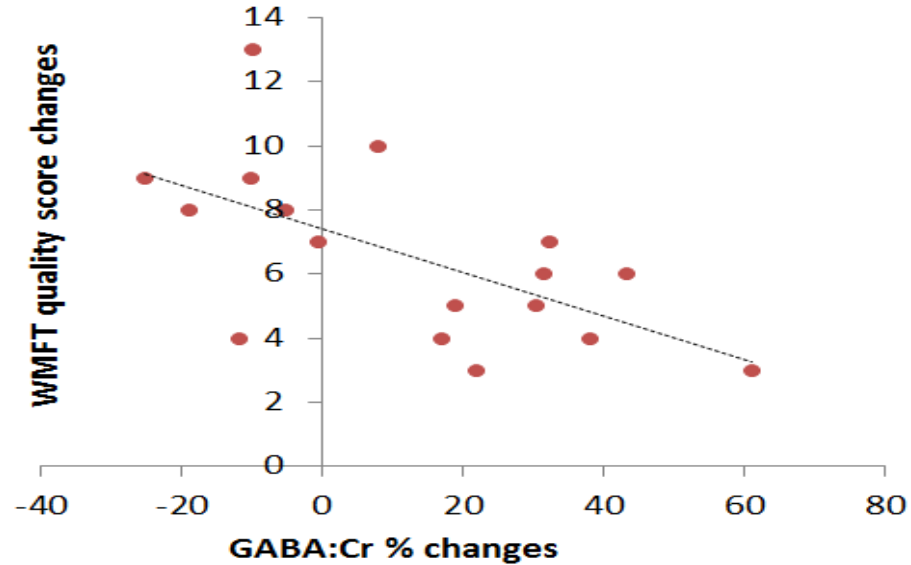
- Cause or effect? Does a GABA decrease improve recovery or does recovery suppress GABA?



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# Discussion

- Cause or effect? Does a GABA decrease improve recovery or does recovery suppress GABA?
- Our results show that GABA is a potential useful biomarker in neurorehabilitation.



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# Future directions

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2. In healthy subjects anodal transcranial direct-current stimulation (tDCS) can decrease GABA and the amount of decrease correlates with motor learning potential in healthy subjects (Stagg 2011, Kim 2014)
3. In stroke patients GABA MRS could help select patients for tDCS (O'Shea J et al. NeuroImage 2014)

