Motor system GABAergic tonic inhibition early after stroke – a pilot study

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Motor system GABAergic tonic inhibition early after stroke – a pilot study

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Brain Plasticity & Recovery Laboratory

- Understand the cellular/molecular mechanisms underlying brain plasticity in humans
- Developing new or modifying current treatments to target neural mechanisms underlying different neurological diseases

Background

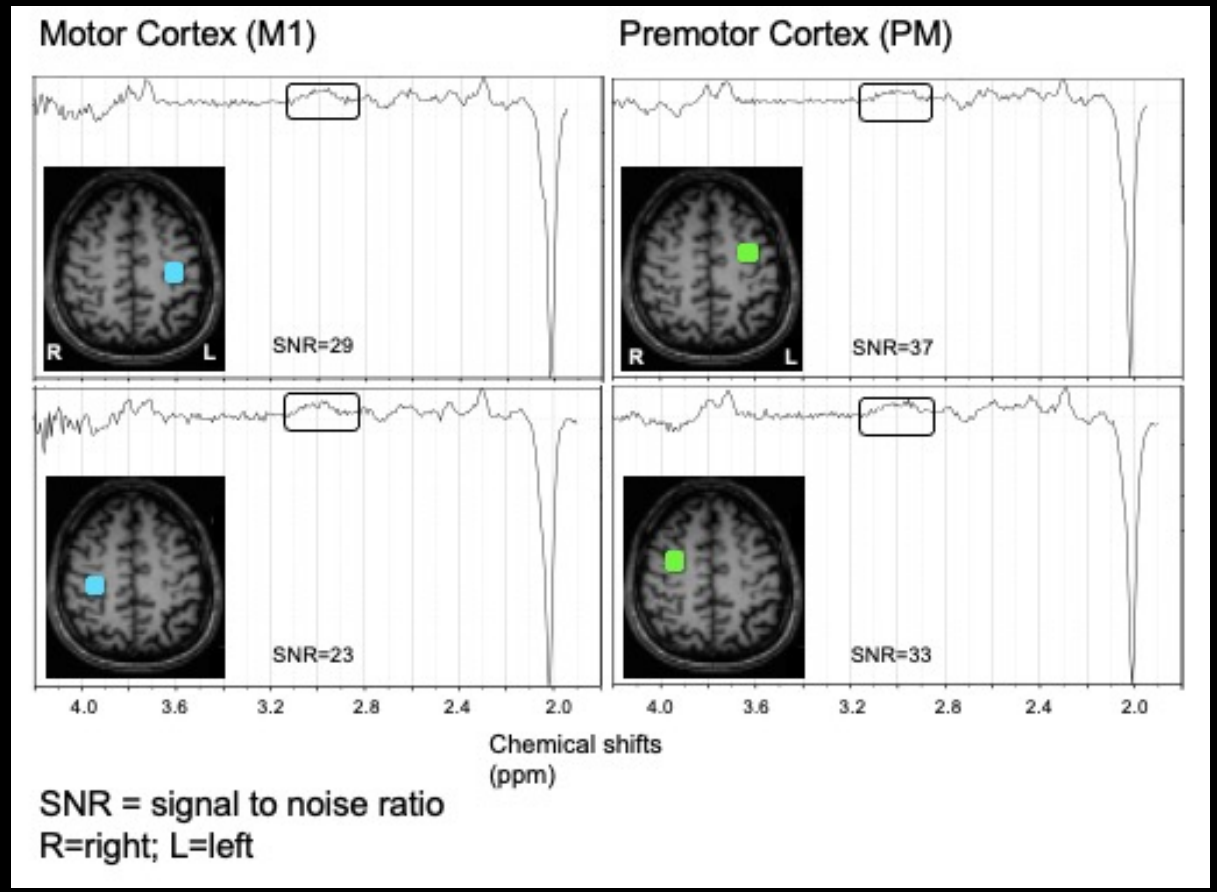
- The percentage of patients who report a lack of recovery of hand function is very high
  - Cortical tonic GABA inhibition dysfunction
- The subacute phase of stroke (48 hours to six months) has max brain plasticity

Objective

- We aimed to study the GABAergic inhibition changes and their functional relevance at admission to rehabilitation in stroke survivors exhibiting arm motor impairment (n=3)

Methods

- Survivors with mild clinical impairment were recruited after acute event.
- GABAergic inhibition was measured via MR Spectroscopy (MEGA-sLASER) in 2 motor areas controlling the paretic arm function
  - GABA levels in each area were compared to those in matched healthy controls (n=3).



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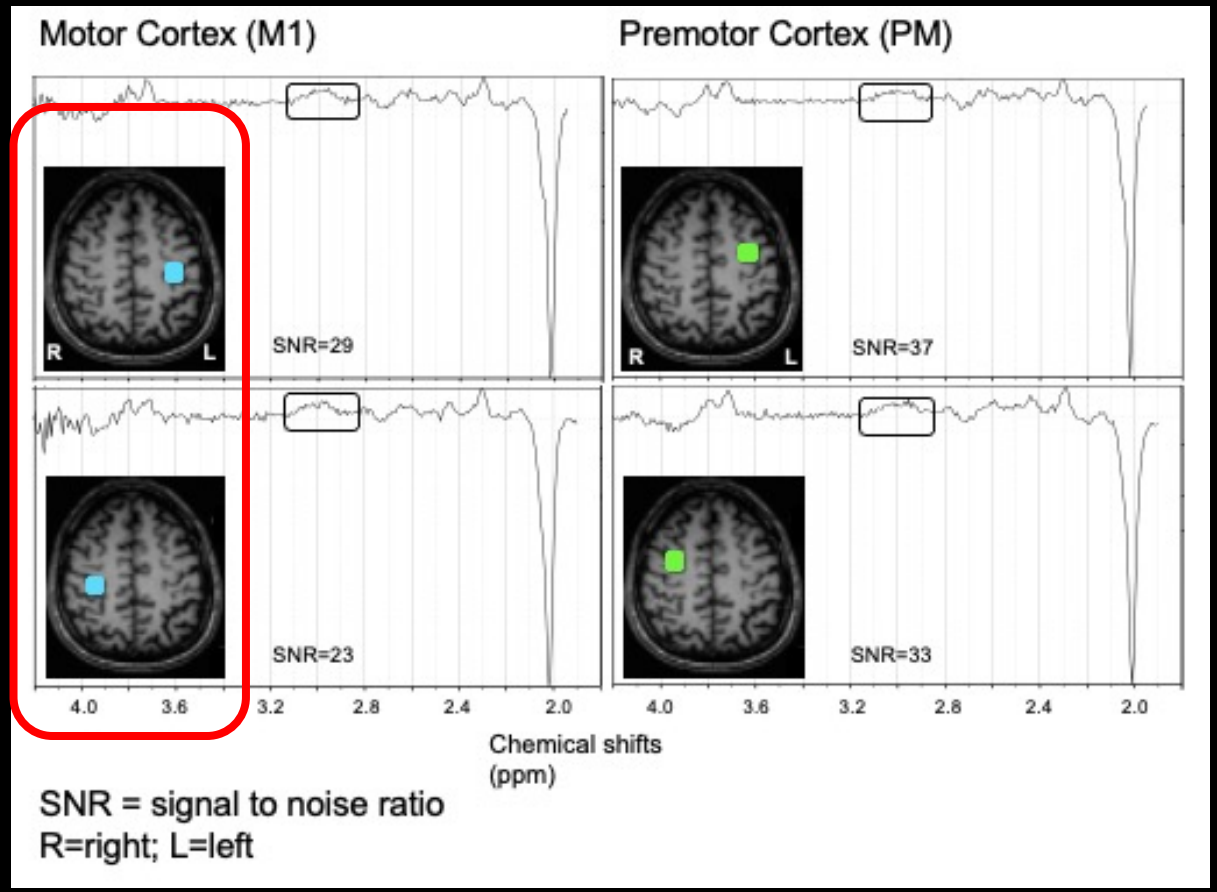

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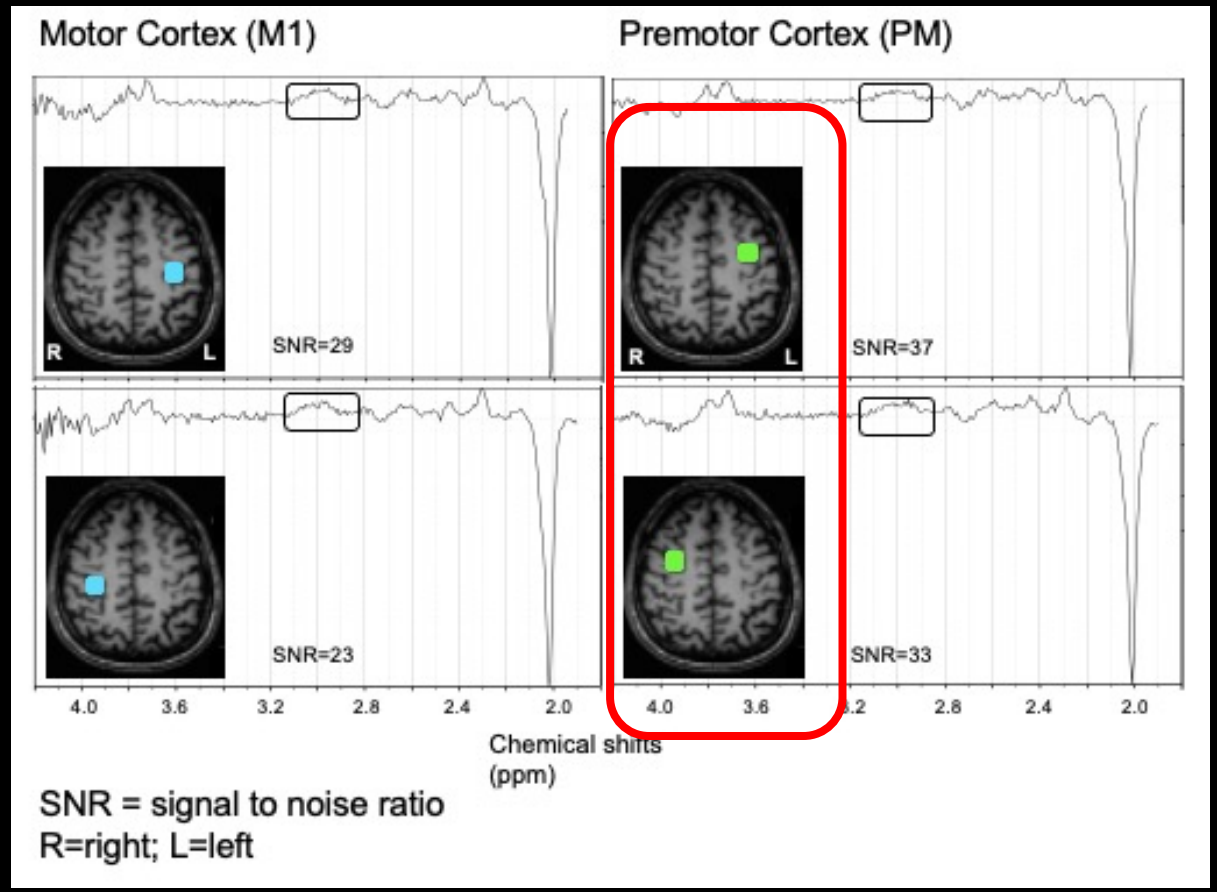

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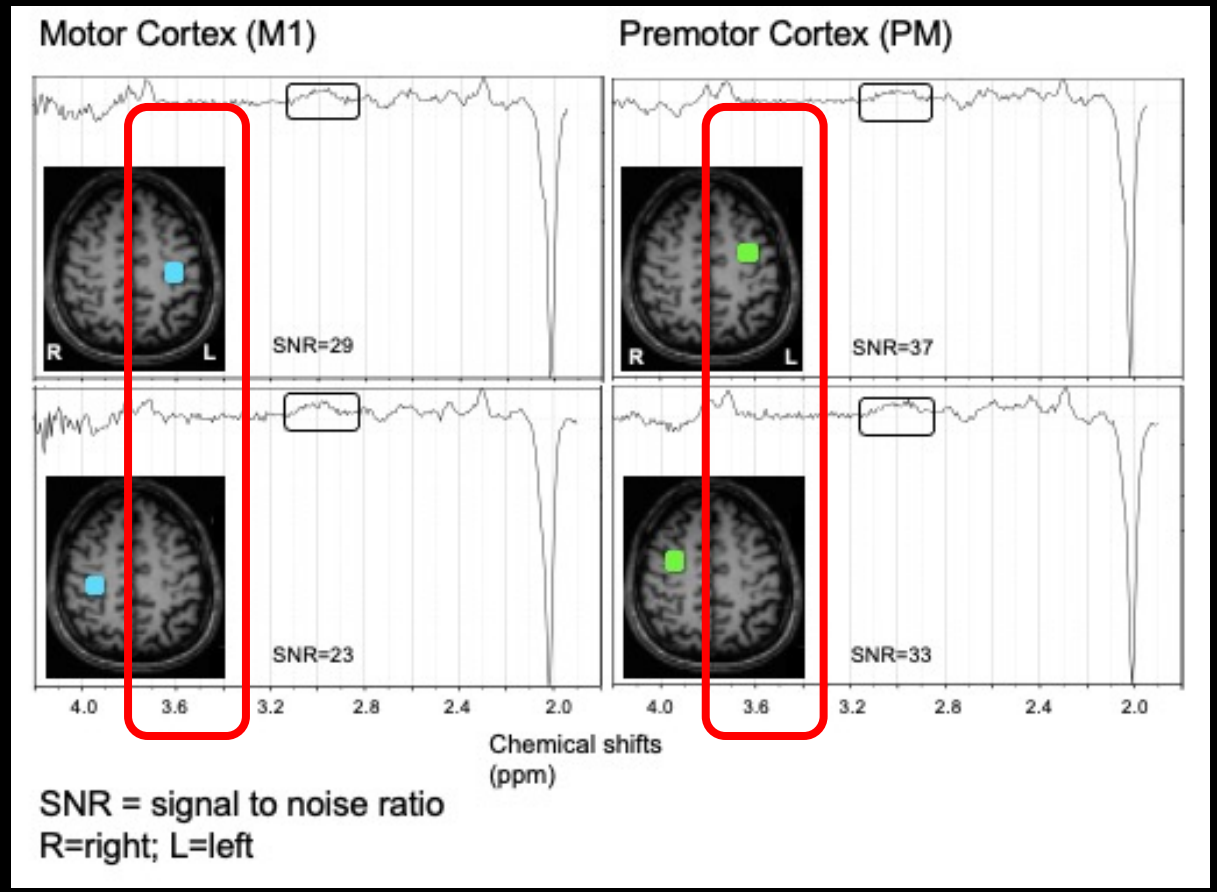

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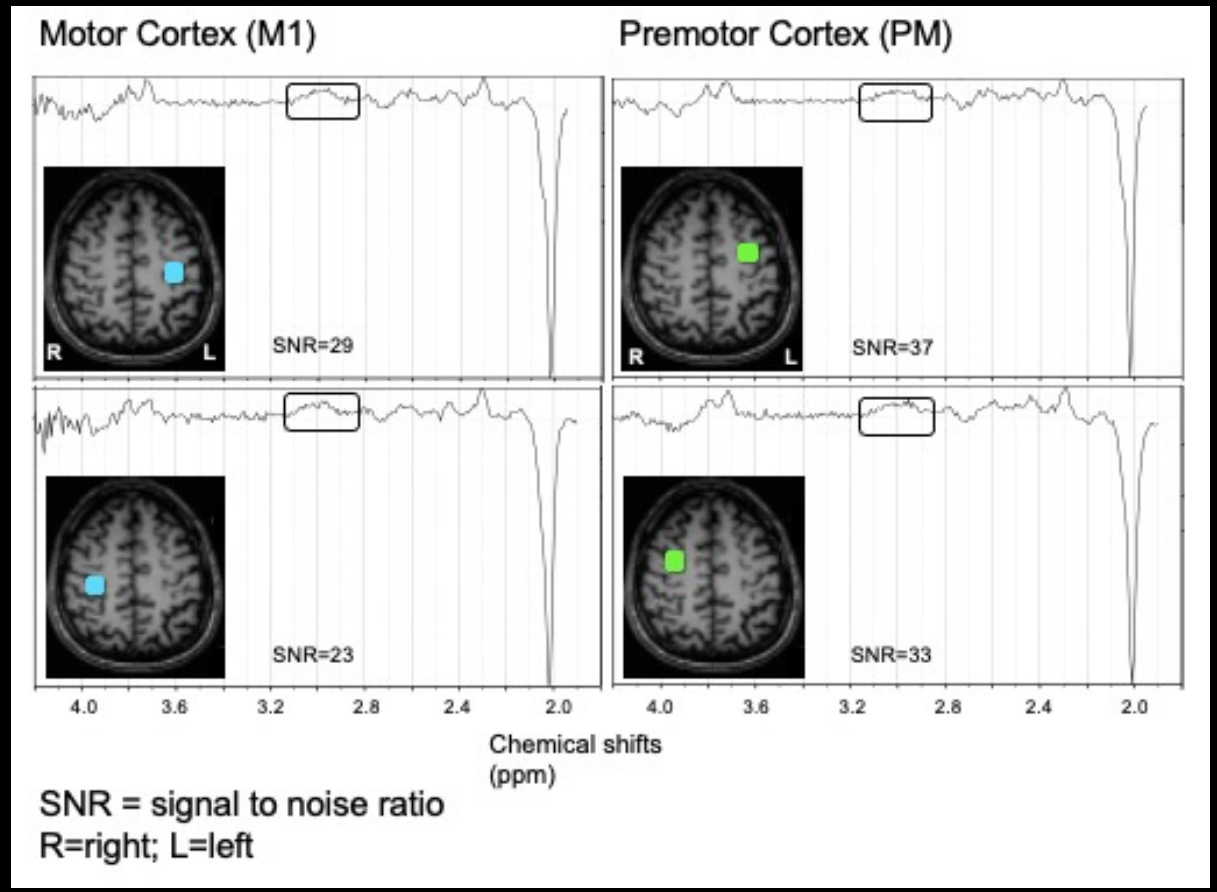
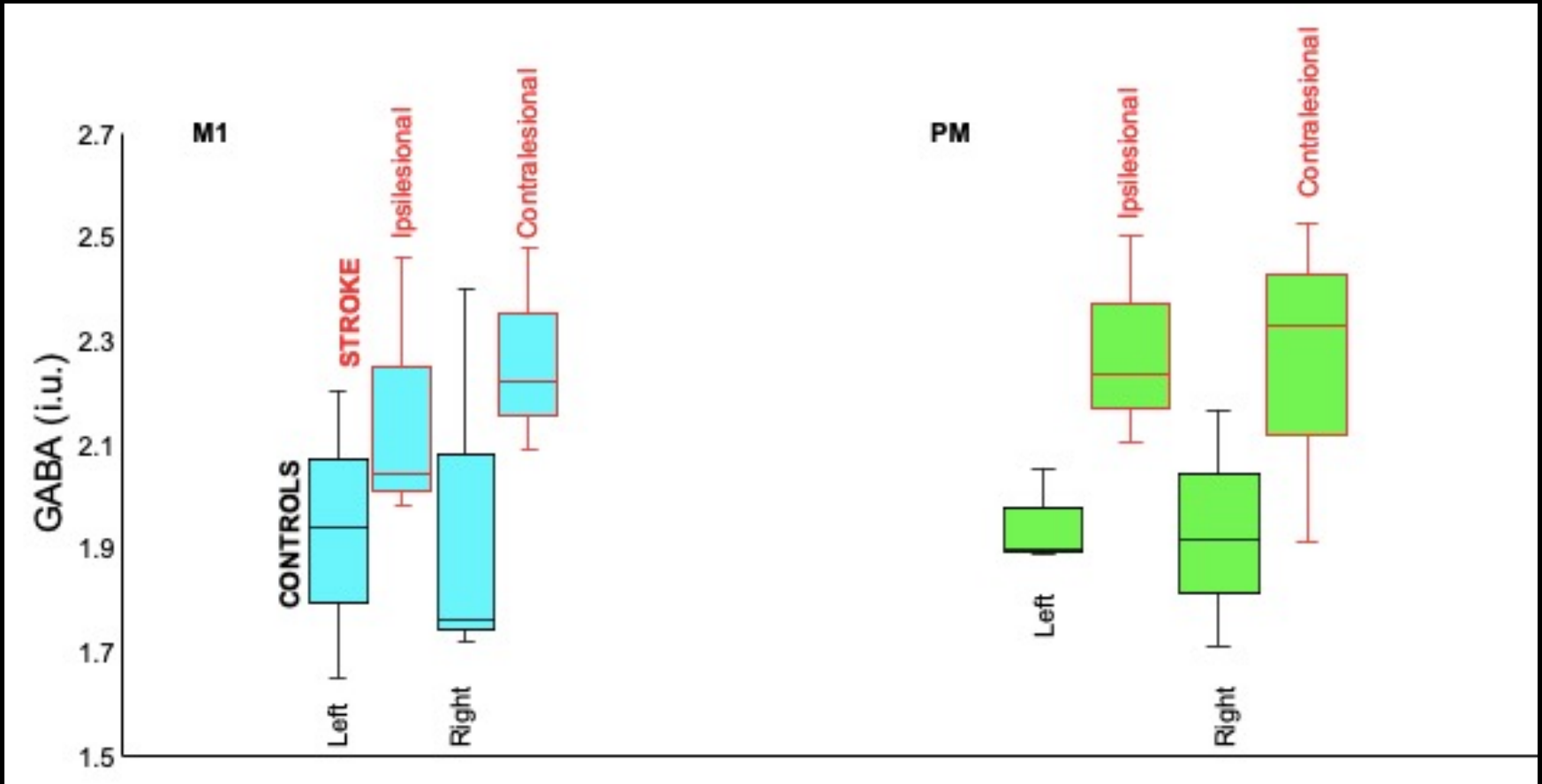


Results


M1
PM
GABA (i.u.)
2.7
2.5
2.3
2.1
1.9
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CONTROLS
STROKE
Ipsilesional
Contralesional
Left
Right
Left
Ipsilesional
Contralesional
Right

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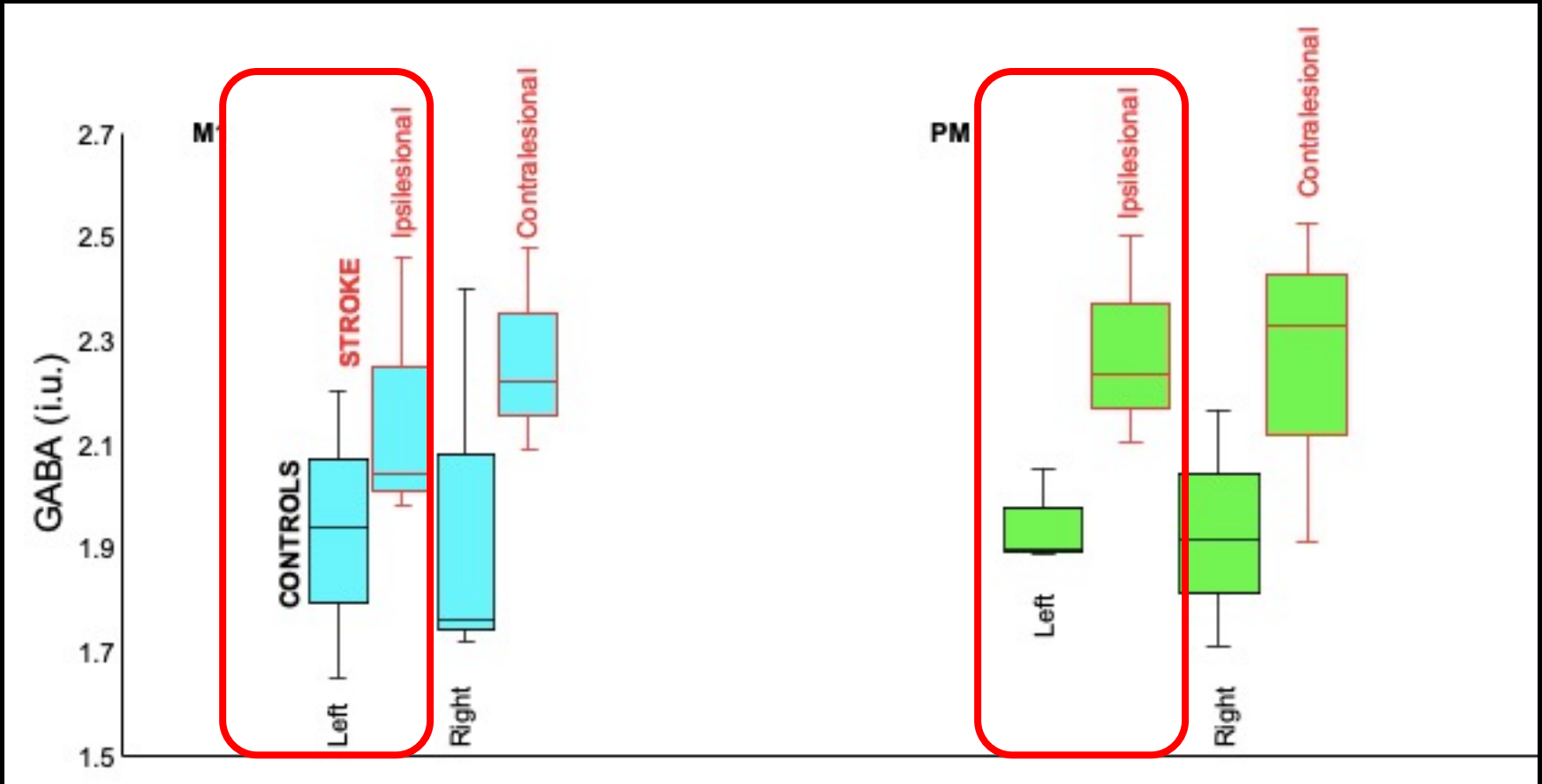
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Conclusions

- Our preliminary data has shown there is a trend toward increased tonic GABAergic inhibition early after stroke.

Next Steps

- Repeat the study with a larger sample size
- Assess the relationship between hand impairment and GABA inhibition
  - Use this knowledge to improve methods used in therapy moving forward

How Undergraduate Research Has Impacted Me

- Opportunities to present and network
  - International Conference on Bioinformatics and Biomedicine (BIBM) in December of 2020
    - I gained a better understanding of how to read, interpret, and present on scientific literature
  - I have made connections with people in the field
- Lead to changing my career path