

DBS for Tremor: Network Effects

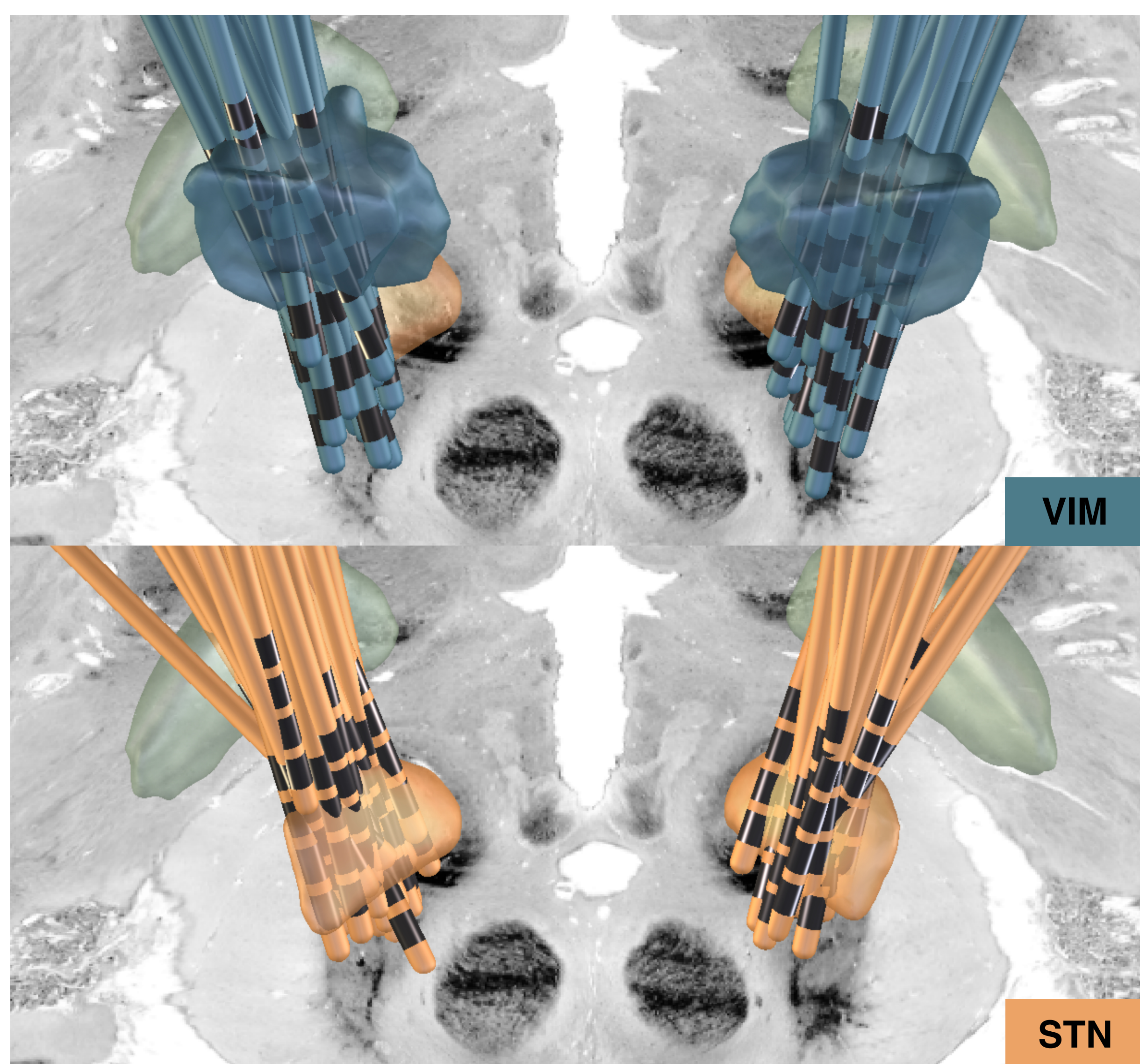
CAN CONNECTIVITY LINK THE EFFECTS OF STN AND VIM DBS ACROSS TREMOR-RELATED DISEASES? A MULTI-COHORT FUNCTIONAL CONNECTIVITY STUDY

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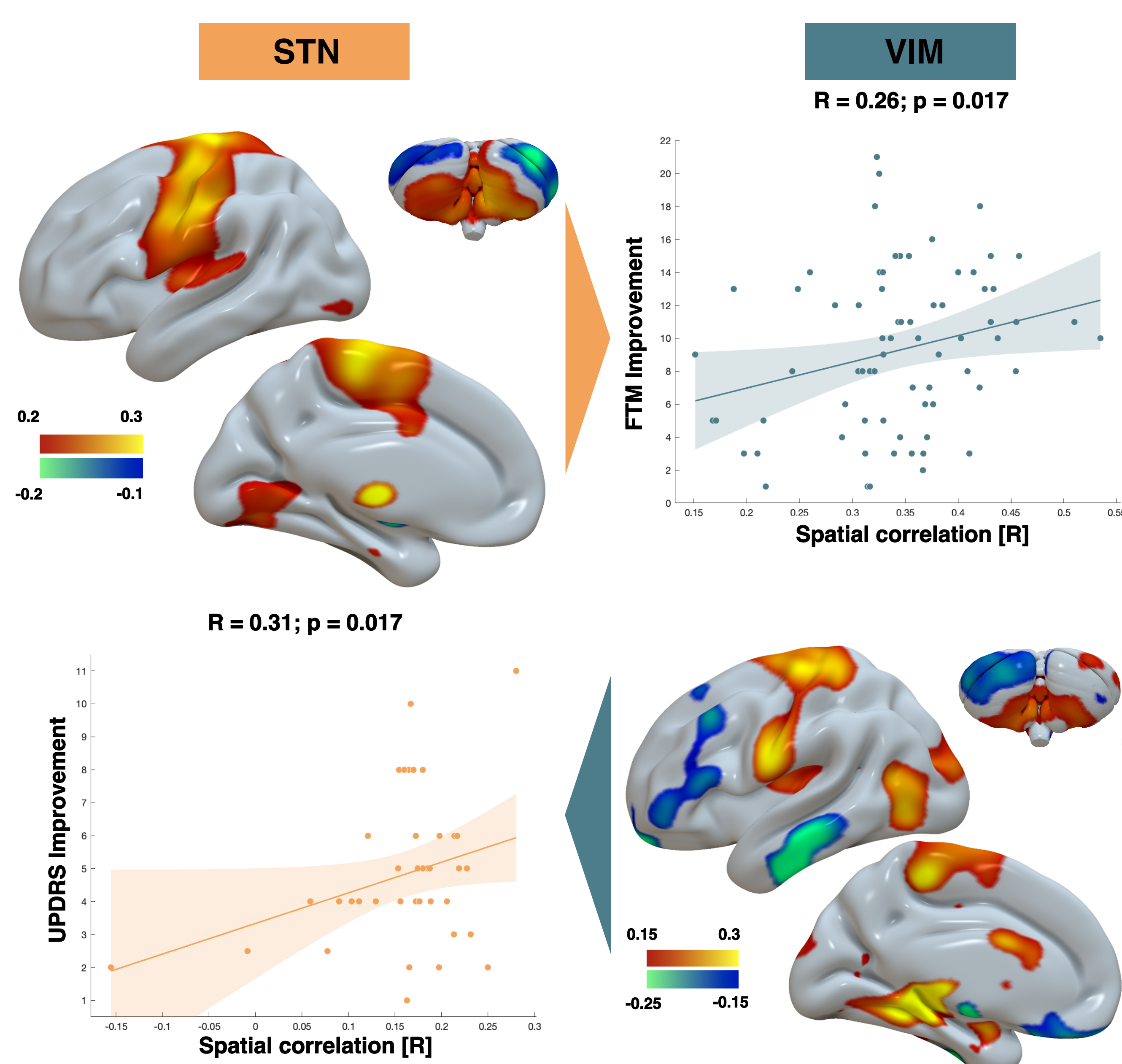
INTRODUCTION

- **Tremor** represents one of the most common symptoms in movement disorders and occurs in multiple diseases, such as **essential tremor (ET)** and **Parkinson's disease (PD)**.
- Multiple regions serve as targets for Deep Brain Stimulation (DBS), for example the **ventral intermediate nucleus (VIM)** in ET-patients or the **subthalamic nucleus (STN)** in PD patients.
- **This study investigates functional connectivity profiles of different stimulation targets in patients with tremor, regardless of the underlying disorder.**



RESULTS

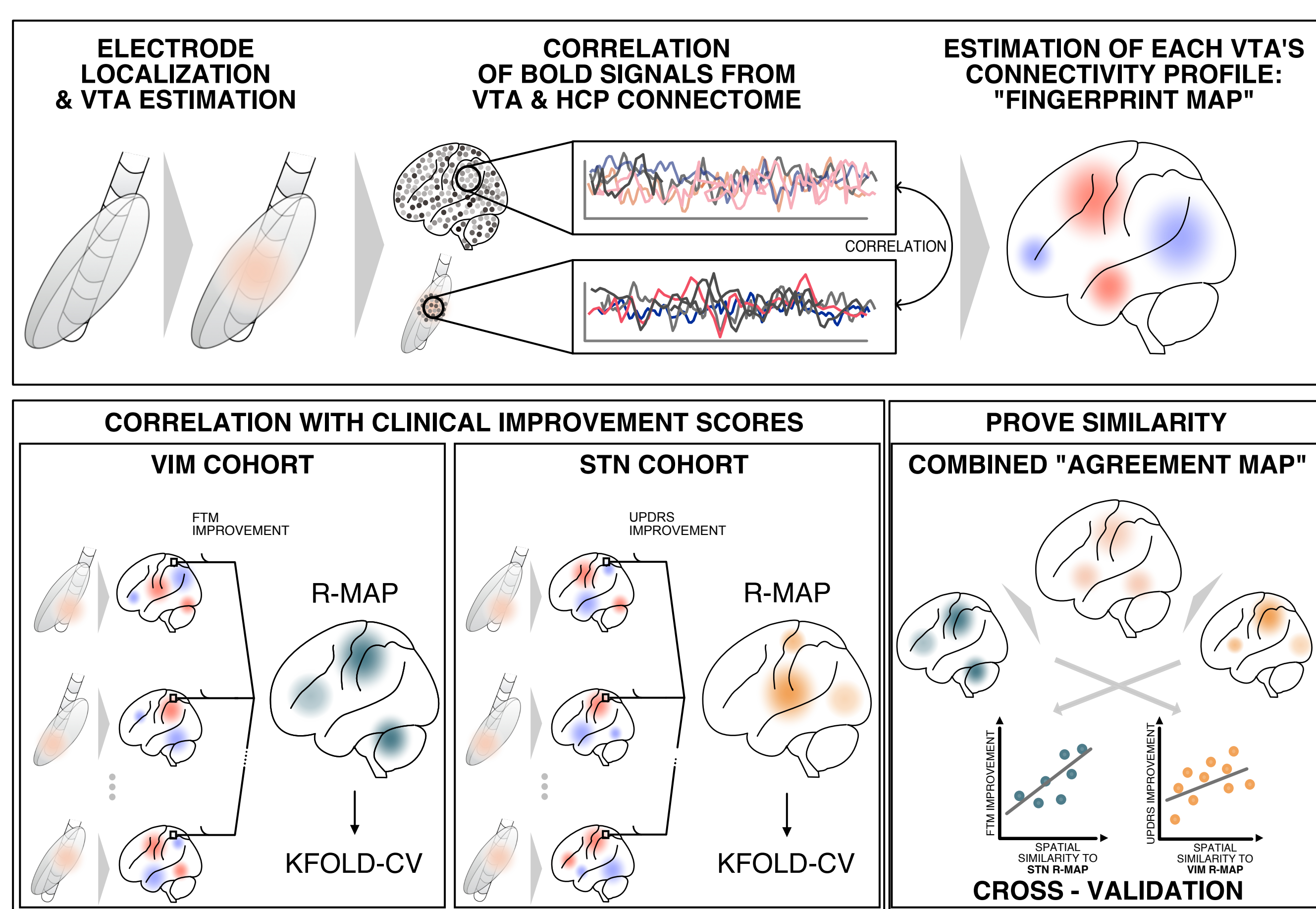
- In total data from **31 PD patients with STN DBS** and **36 ET patients with VIM DBS** were included (see Introduction for electrode localizations).
- Our analysis pipeline revealed one R-map for each cohort, representing voxels of high connectivity values to the stimulation area and optimal clinical outcomes.



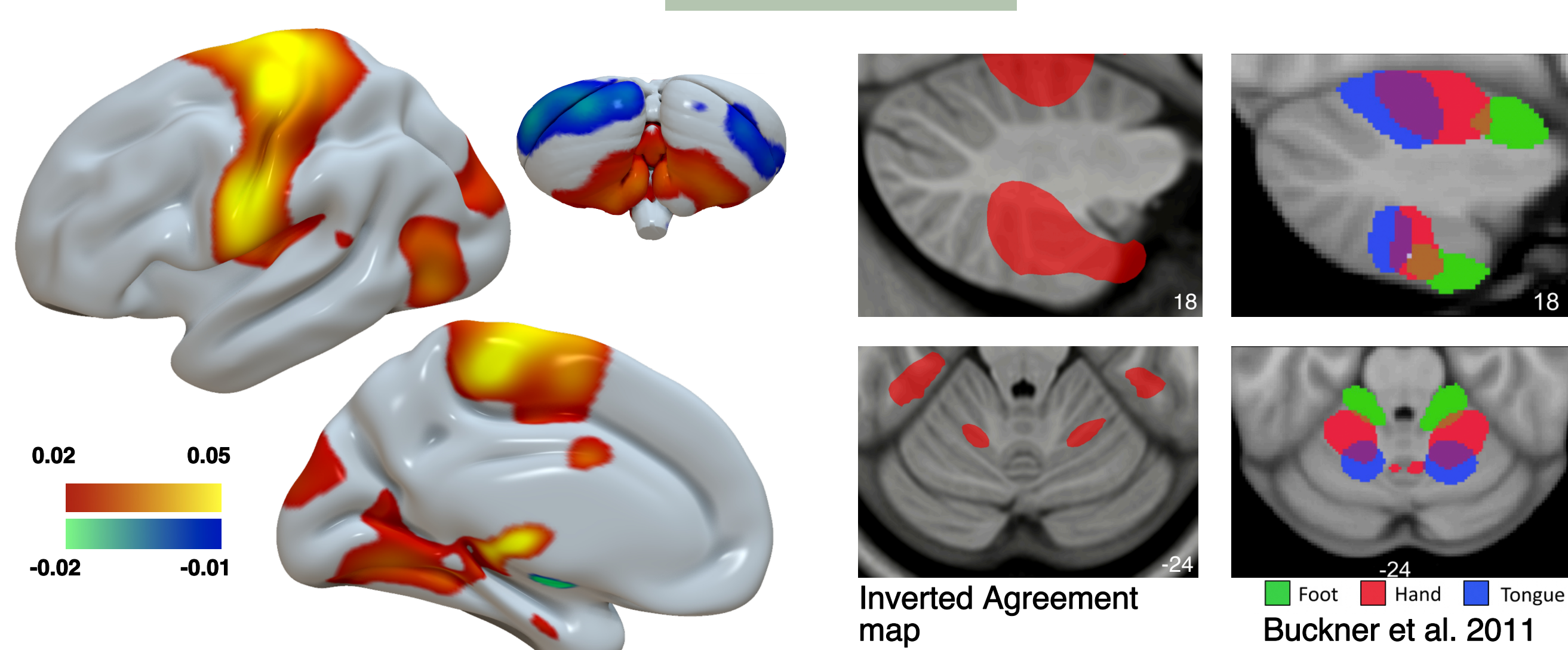
- STN R-map showed significant association with clinical improvement values in VIM cohort and vice versa.

METHODS

- Retrospective imaging and clinical data (UPDRS-III for PD and FTM for ET) from DBS centers Berlin, Würzburg and Amsterdam were analyzed using the following approach:



AGREEMENT



CONCLUSIONS

- While recent connectivity network analyses for the total UPDRS-III in PD patients revealed differences from networks in ET patients, our results suggest that a **symptom-specific, common network for tremor** exists across both ET and PD patients.
- Consistent with previous studies, both M1 and cerebellar regions appear to play an important role in a functional network for tremor improvement.
- To validate these results, further investigation including different diseases and targets is needed.

