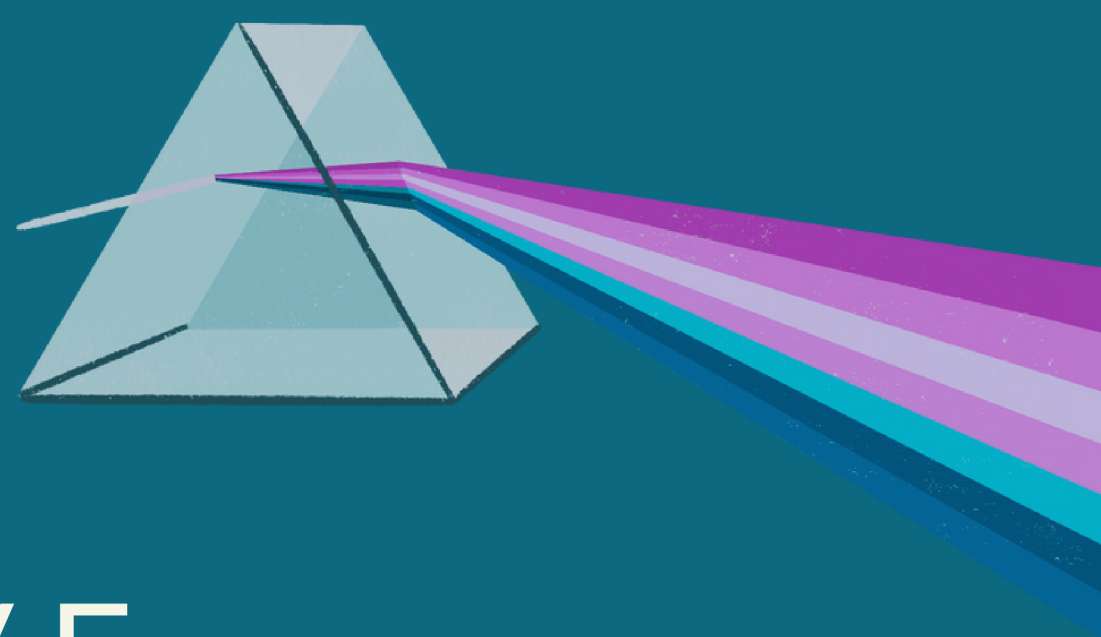
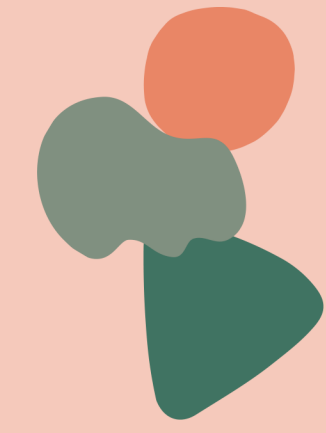


SYMPTOM NETWORK MODULATION BY DEEP BRAIN STIMULATION IN OBSESSIVE-COMPULSIVE DISORDER

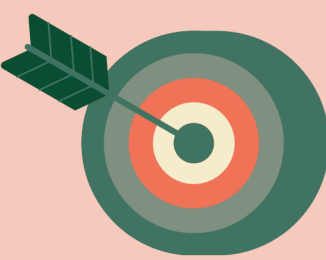


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1 INTRODUCTION



Heterogeneity of symptom presentation in patients with obsessive-compulsive disorder (OCD) is a key source of **outcome variability** following deep brain stimulation (DBS) [1].



While targeting a dedicated fiber bundle in the internal capsule is successful in “average” patients [2,3,4], **personalized treatment** may require modulating a blend of multiple **symptom tracts** [5].

AIM

To segregate the global OCD response tract into a set of subcircuits related to improvements of **obsessions, compulsions, depression, anxiety, cognitive control, cognitive flexibility, & global functioning**

2 METHODS



PATIENT COHORT:

N = 70 OCD patients with bilateral DBS to five different stereotactic targets – **anterior limb of the internal capsule (ALIC)**, **bed nucleus of the stria terminalis (BNST)**, **inferior thalamic peduncle (ITP)**, **subthalamic nucleus (STN)**, & **ALIC / STN combined**



SYMPTOM IMPROVEMENTS:

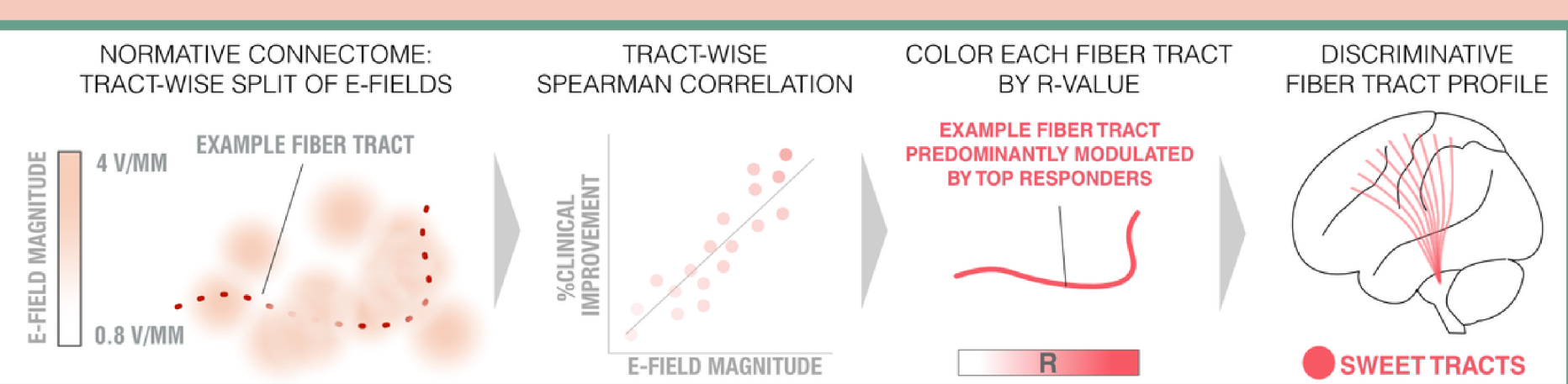
Obsessions vs. compulsions (Yale-Brown Obsessive Compulsive Scale), **depression** (Beck Depression Inventory / Montgomery Åsperg Depression Rating Scale / Hamilton Depression Inventory), **anxiety** (Hamilton and Beck Anxiety Inventories / state section of the State-Trait Anxiety Inventory), **cognitive control** (Stroop), **cognitive flexibility** (Intra-Extra Dimensional Set Shift Task / Trail Making Test, Part B, and **general level of functionality** (Global Assessment of Functioning)



LEAD-DBS BASED PREPROCESSING PIPELINE [6]: Electrode reconstructions & estimation of local DBS impact (electric field modeling)



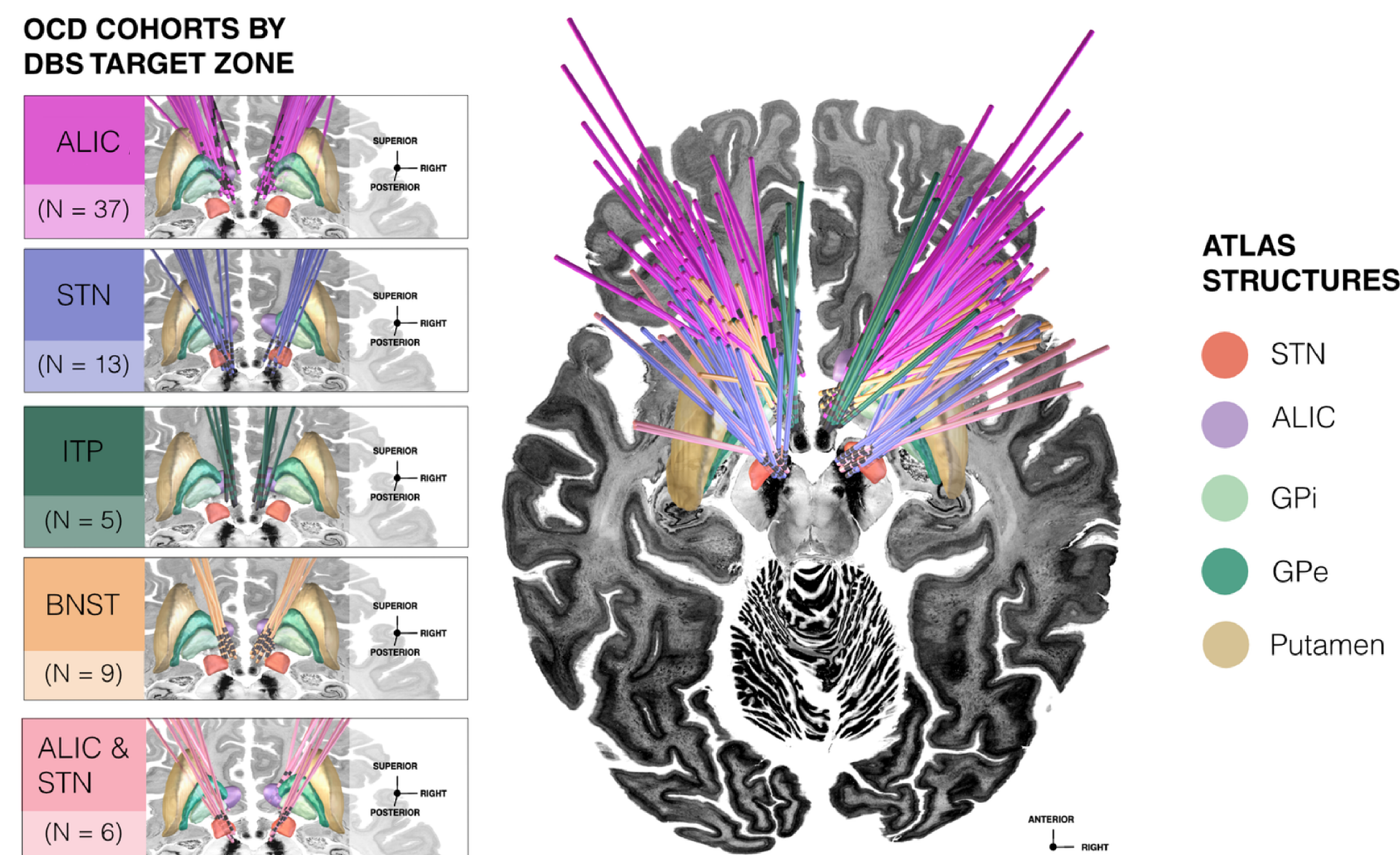
DBS FIBER FILTERING [7]: Identification of streamlines from a normative group connectome **discriminative for beneficial stimulation effects per symptom domain** and confirmation of these tract models using in-sample correlations as well as **five-fold cross-validations (CV)**



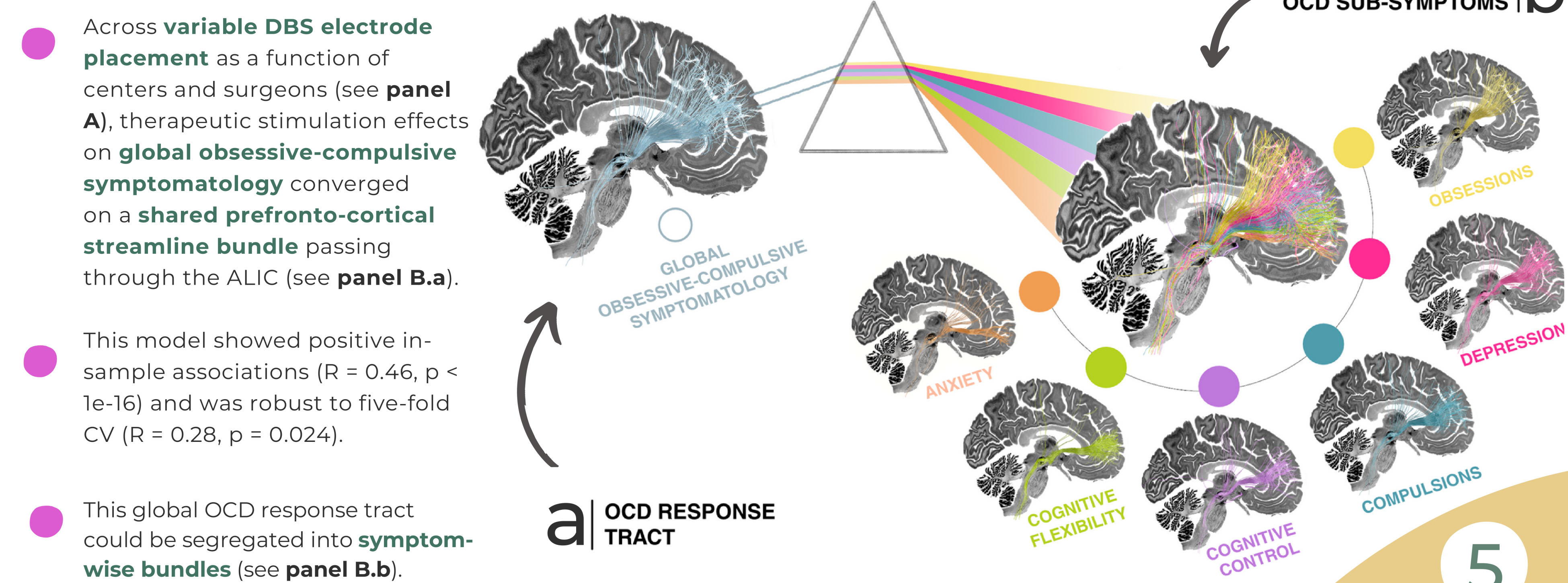
4 DISCUSSION

- The identified networks may improve our understanding of the underlying **pathophysiology** and **mechanism of action of DBS** attributed to various OCD symptoms.
- Further, they may prove valuable in the context of **transdiagnostic symptoms** or in **personalized tailoring** of treatment to symptom constellations of individual patients [1,5].

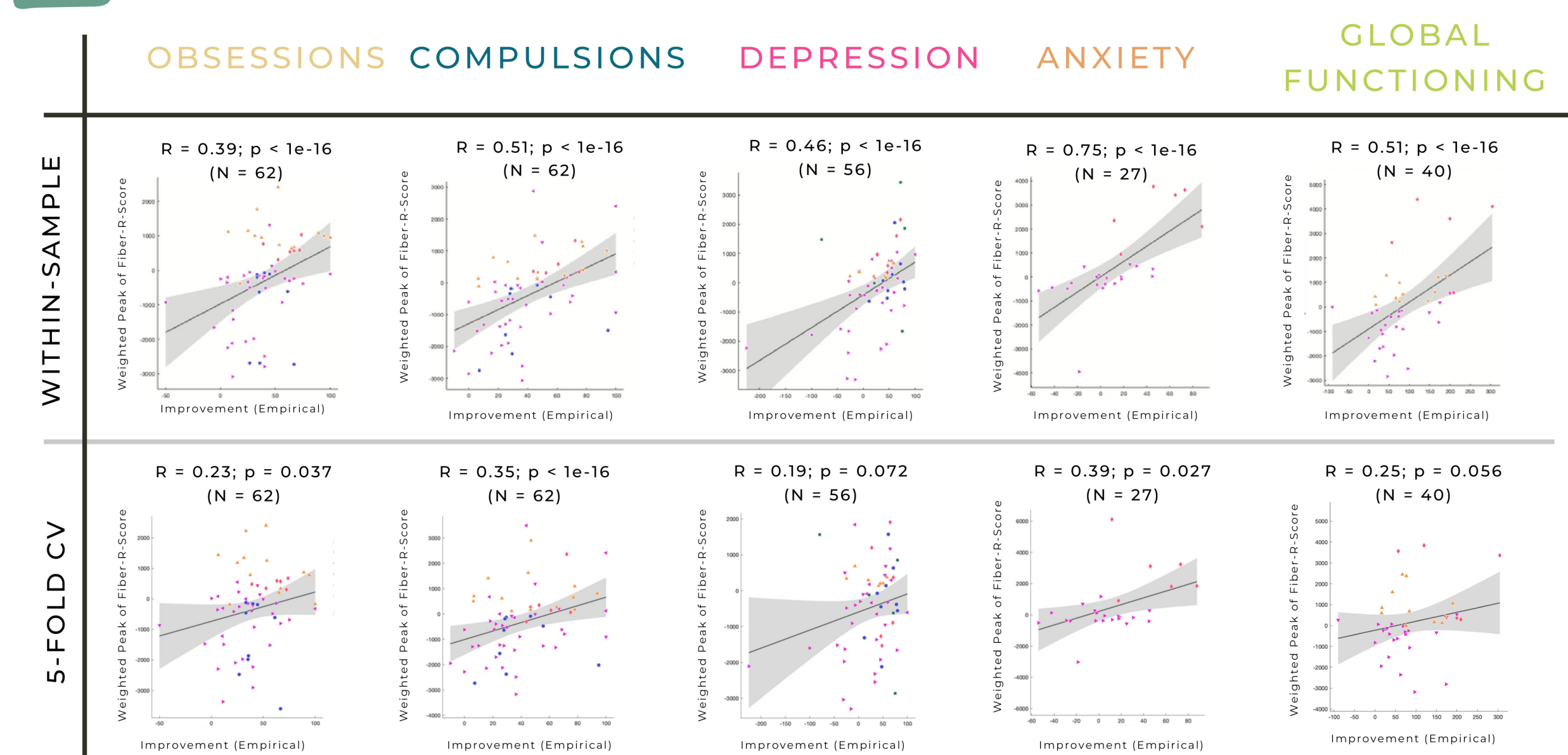
A ELECTRODE PLACEMENT IN MULTICENTRIC OCD-DBS PATIENT COHORT



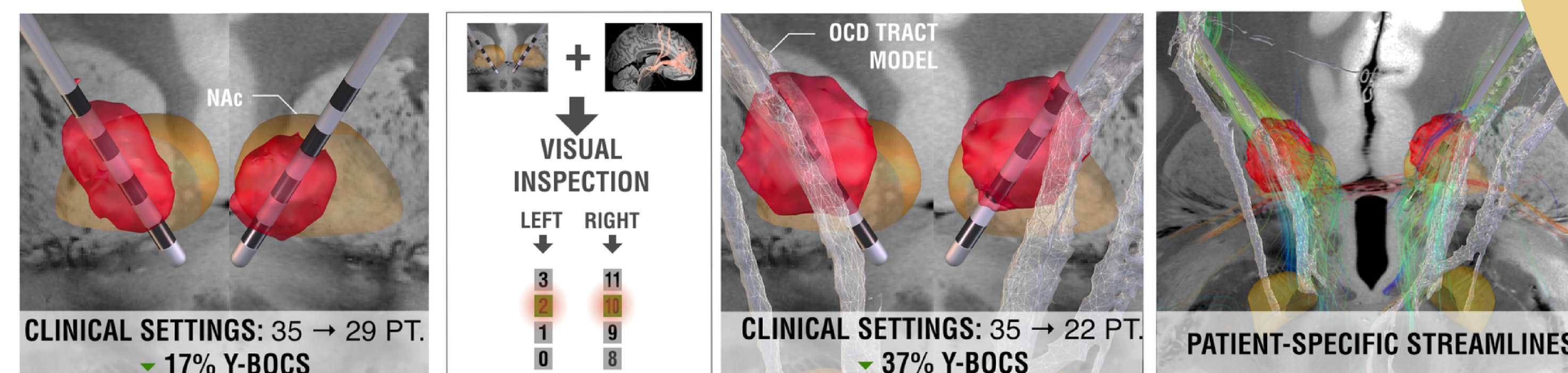
B THERAPEUTIC SYMPTOM NETWORK SPECTRUM IN DBS FOR OCD



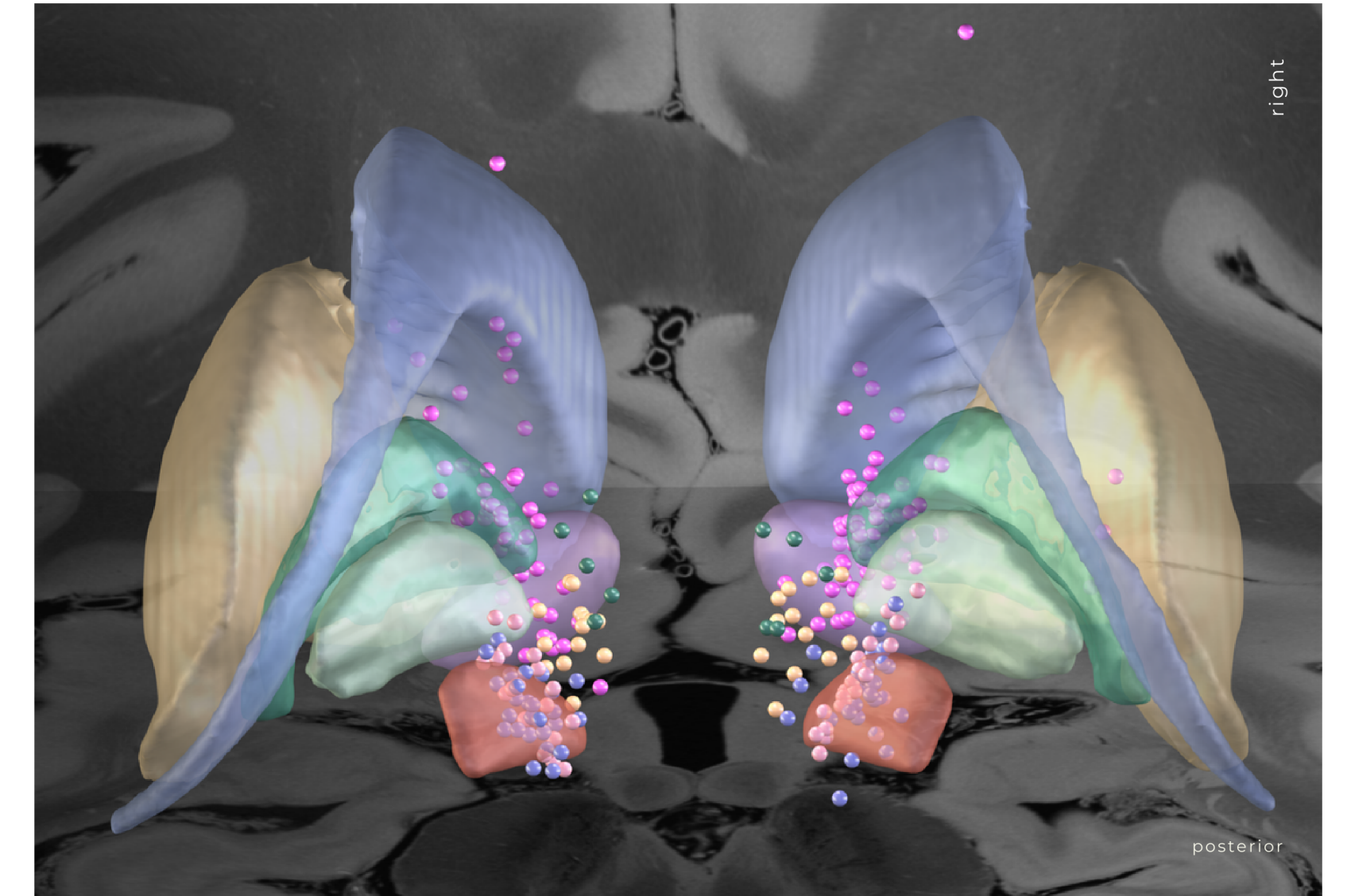
C VALIDATION OF SYMPTOM-NETWORK MAPPINGS



PROSPECTIVE VALIDATION OF GLOBAL OCD RESPONSE TRACT MODEL (N = 1)



RESULTS 3



CONCLUSION 5

JUST LIKE A PRISM BREAKS UP THE LIGHT, DBS CAN BE USED AS A TOOL TO SEGREGATE BRAIN CONNECTOMES INTO SYMPTOM TRACTS.

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