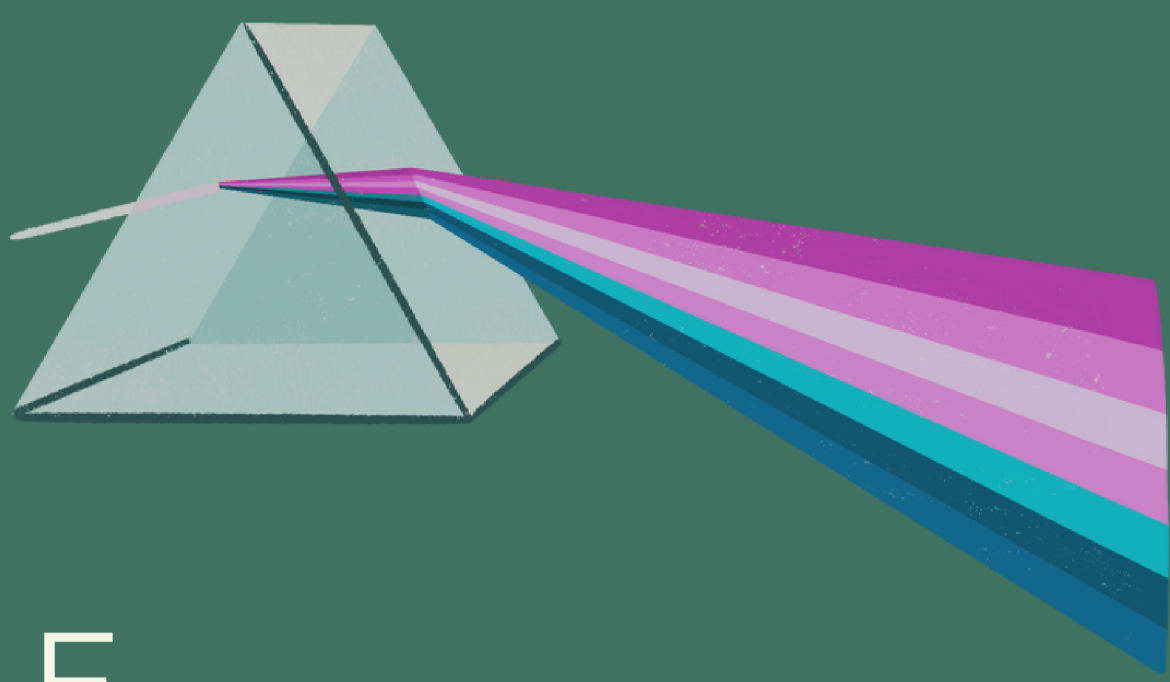


# SYMPTOM NETWORK MODULATION BY DEEP BRAIN STIMULATION IN OBSESSIVE-COMPULSIVE DISORDER

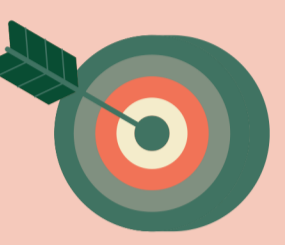


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## 1 INTRODUCTION



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, and 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



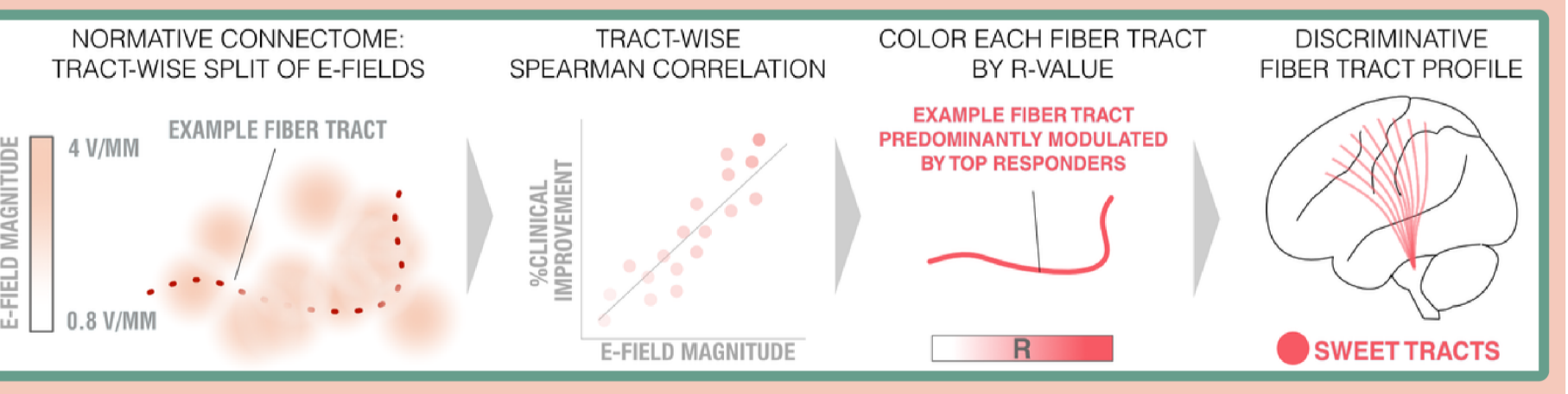
**SYMPTOM IMPROVEMENTS:**  
Obsessions vs. compulsions (Yale-Brown Obsessive Compulsive Scale), depression (Beck Depression Inventory / Montgomery Åsperg Depression Rating Scale / Hamilton Depression Inventory), anxiety (Hamilton and Beck Anxiety Inventories / state section of the State-Trait Anxiety Inventory), 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)



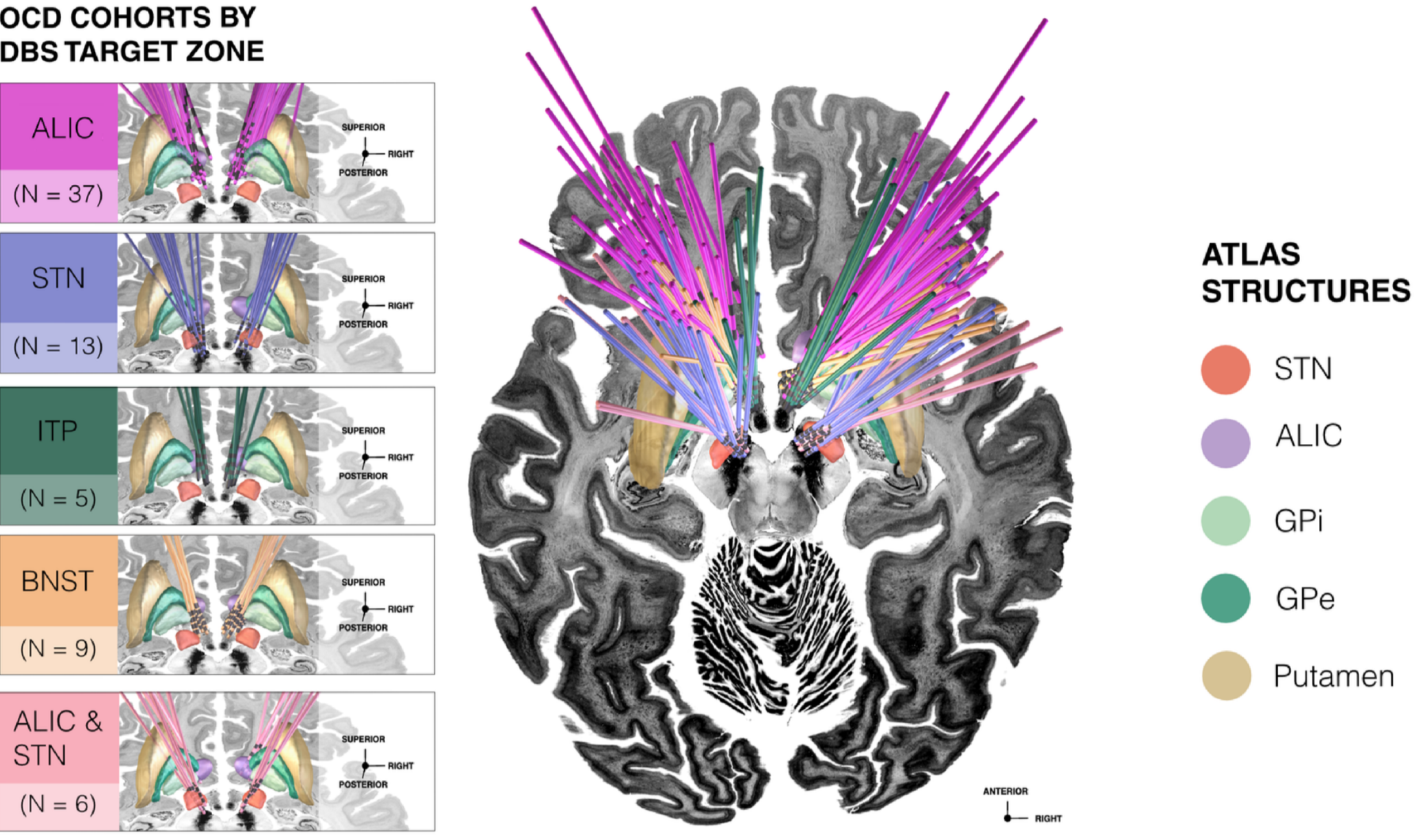
**DBS FIBER FILTERING** [7]: Identification of streamlines from a normative group connectome discriminative for beneficial stimulation effects per symptom domain and confirmation of these tract models using in-sample correlations as well as five-fold cross-validations (CV)



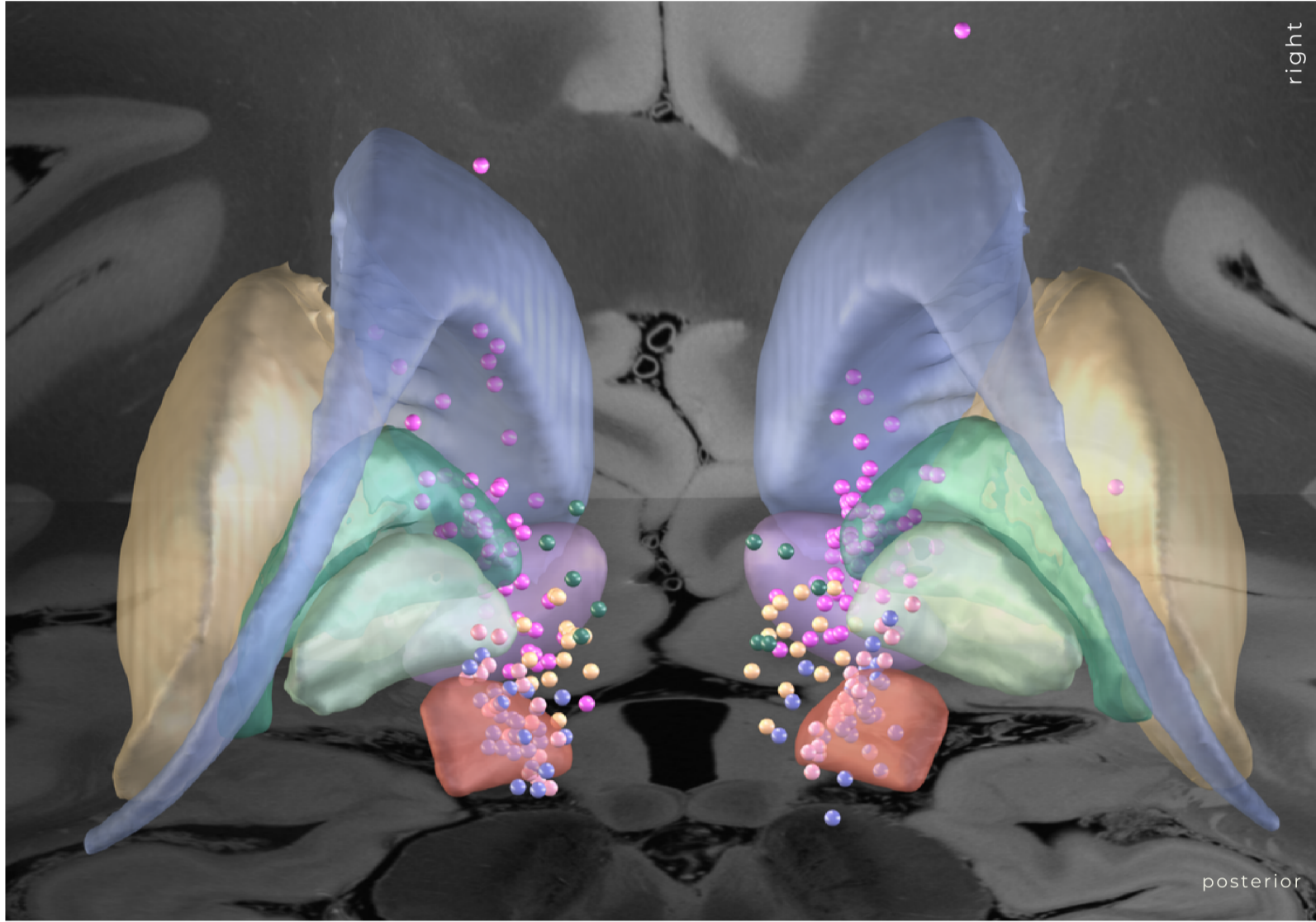
## 4 DISCUSSION

- Presented 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].

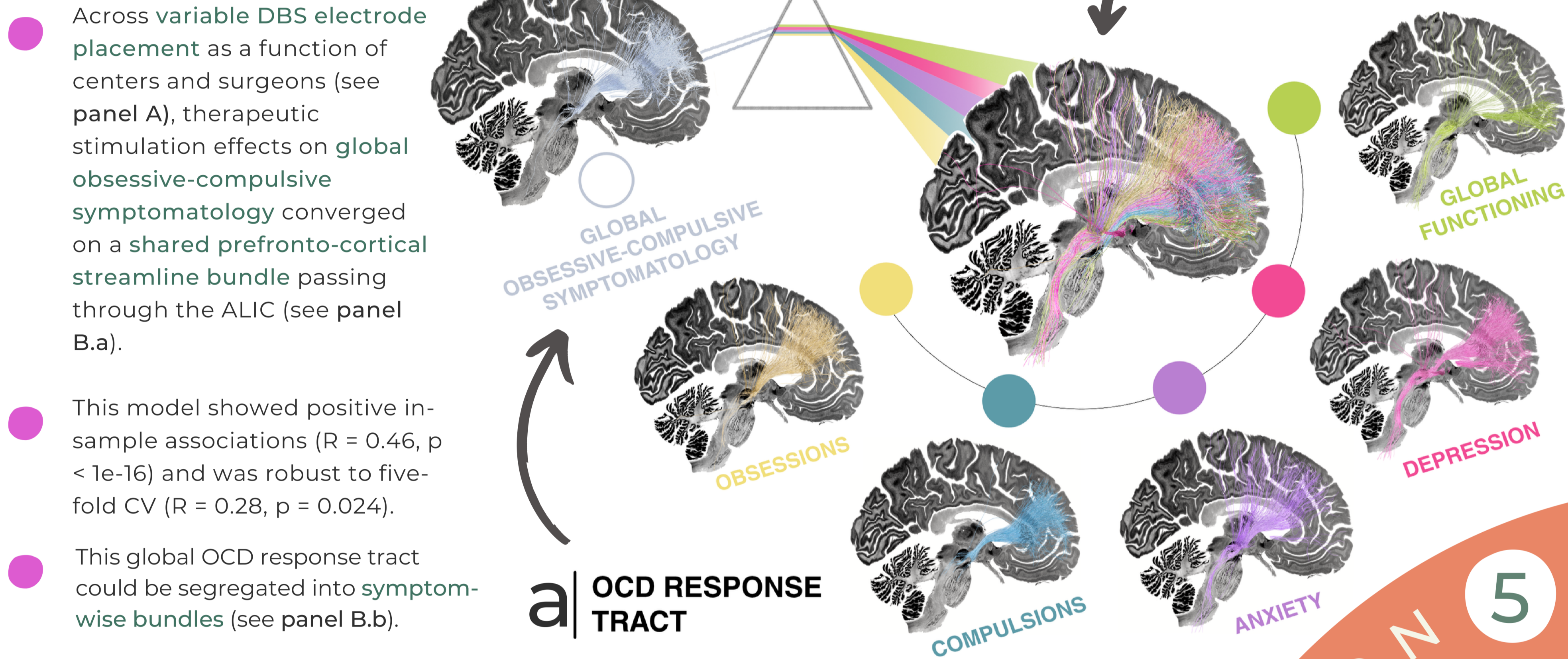
### A ELECTRODE PLACEMENT IN MULTICENTRIC OCD-DBS PATIENT COHORT



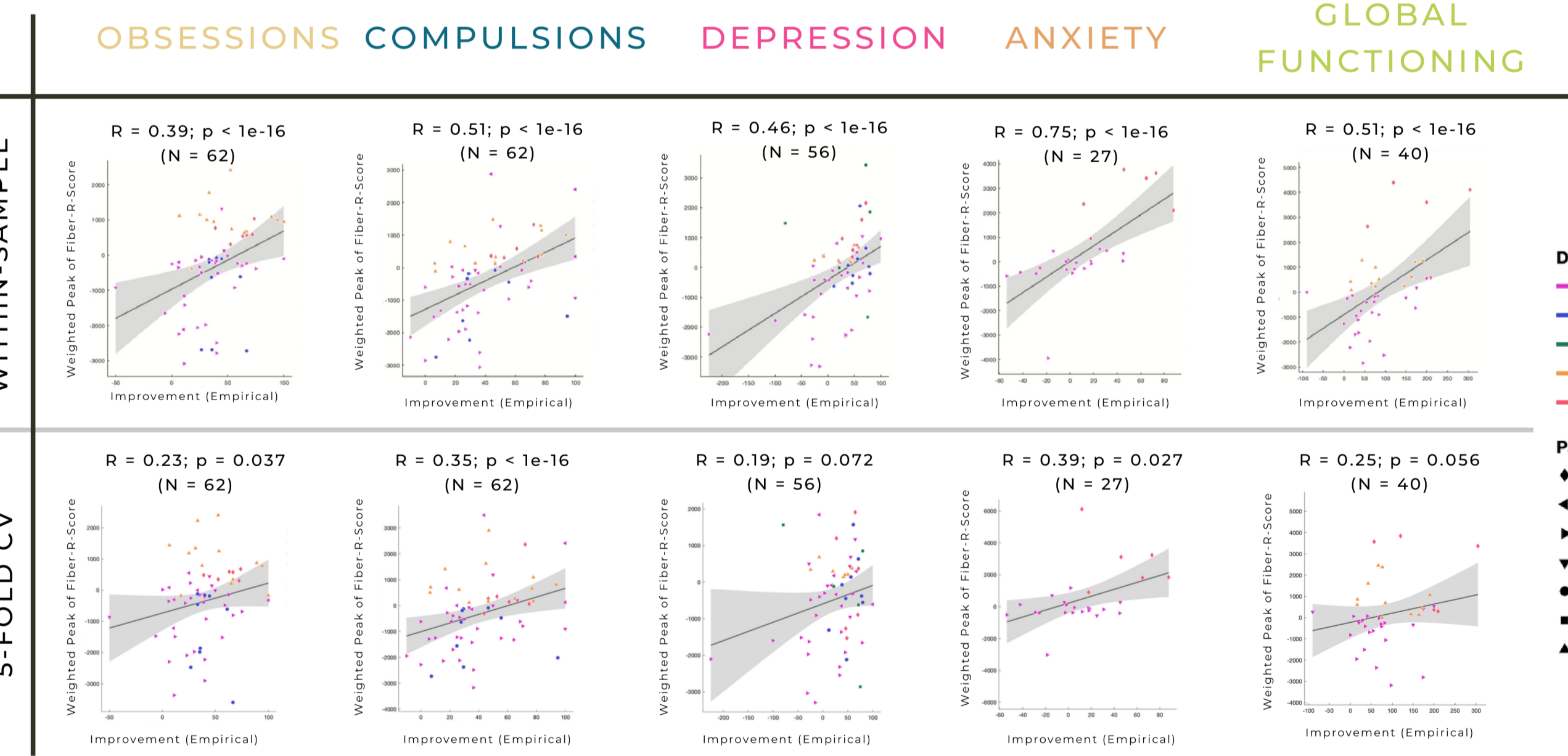
## RESULTS 3



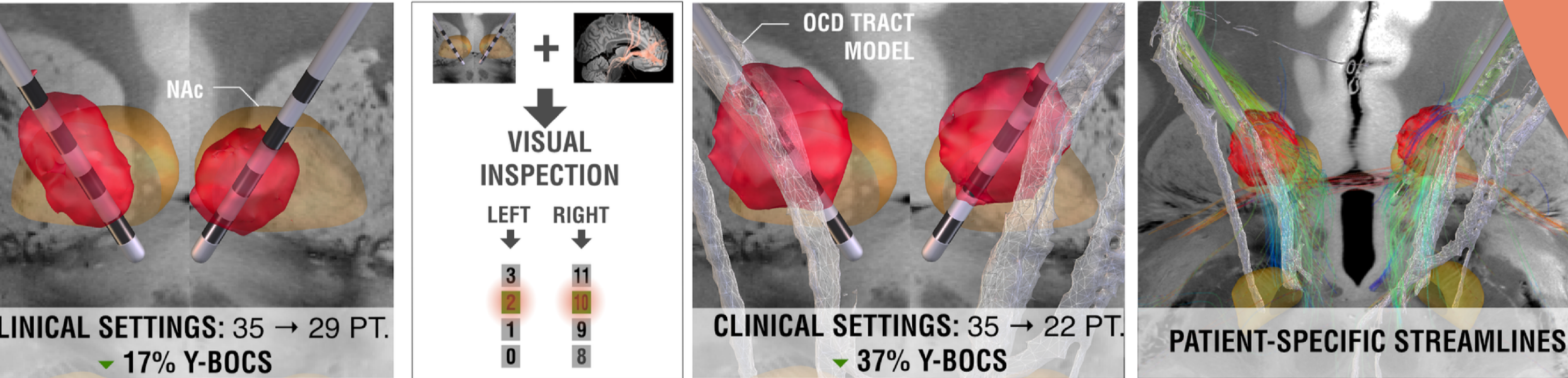
### B THERAPEUTIC SYMPTOM NETWORK SPECTRUM IN DBS FOR OCD



### C VALIDATION OF SYMPTOM-NETWORK MAPPINGS



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



## 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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