

Title: An eating disorders network derived from human brain lesions



PRESENTER:
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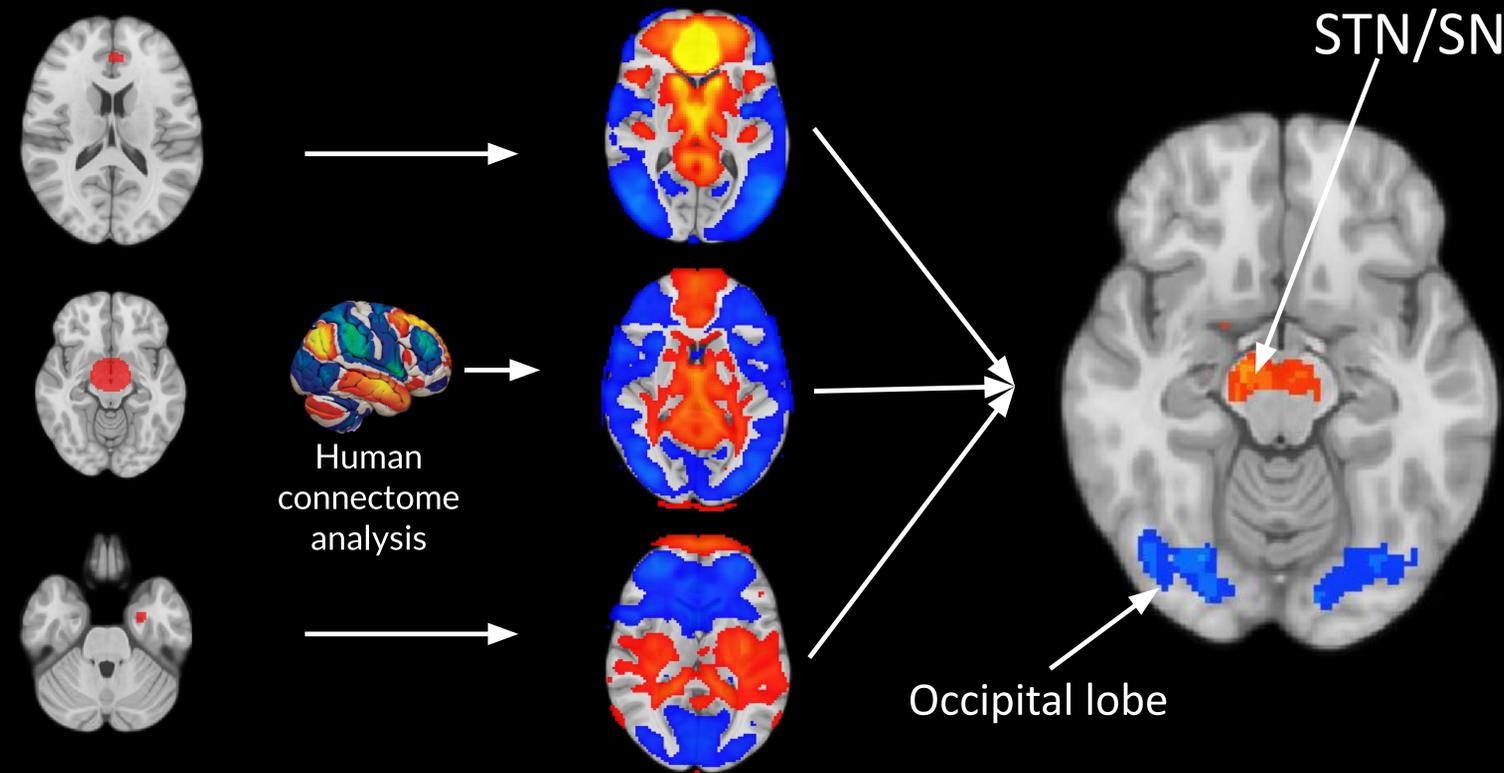
BACKGROUND:
Eating disorders have been associated with hypothalamic disturbances in humans, but lesions in the frontal and temporal lobes have also been connected to eating disorders. Functional neuroimaging suggests other related regions. A network perspective is therefore needed to better understand the brain regions associated with eating disorders.

- METHODS**
1. We identified 15 cases of lesion-induced eating disorders using a published systematic review¹.
 2. Lesions were mapped to a common brain atlas (MNI-152 space) and regions functionally connected to each lesion were computed using human connectome data (n=1000)².
 3. Common connections were identified by overlapping the lesion network maps.
 4. We assessed overlap with task-based neuroimaging studies of "eating".
 5. We investigated the therapeutic relevance of these connections using published neurosurgical ablation and deep brain stimulation (DBS) sites.

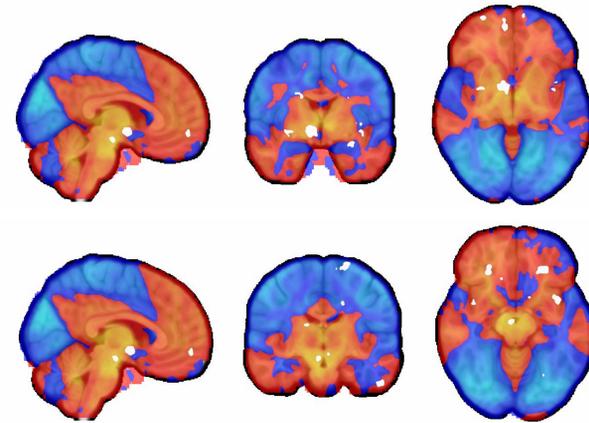
¹R Uher, J Treasure (2005). Brain lesions and eating disorders. *Journal of Neurology, Neurosurgery, and Psychiatry*.

²Michael D. Fox (2018). Mapping Symptoms to Brain Networks with the Human Connectome. *The New England Journal of Medicine*.

Human brain lesions causing eating disorders map to a common brain circuit



Neuroimaging correlates

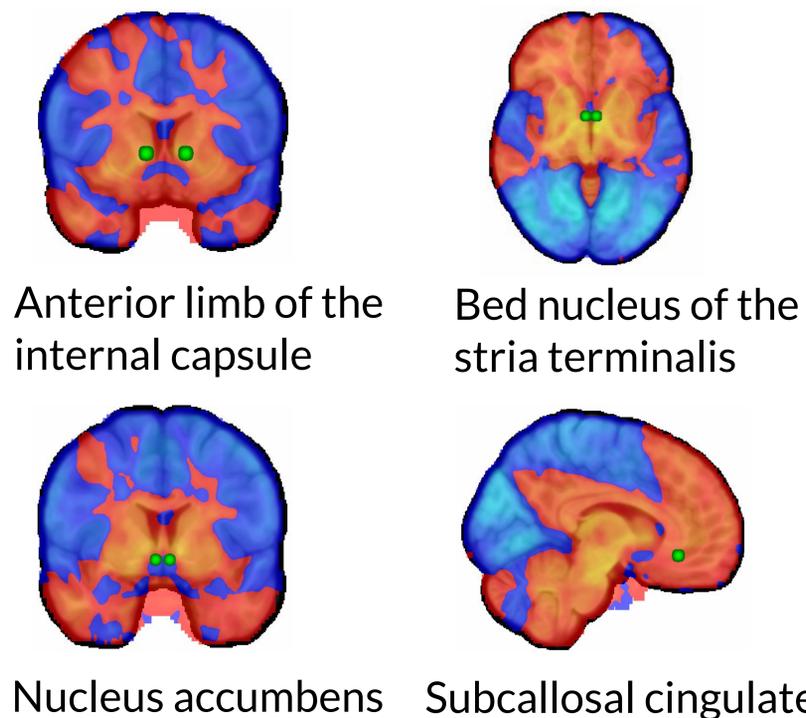


- RESULTS**
- Lesions causing eating disorders map to a specific brain circuit defined by positive connectivity to the subthalamic nucleus/substantia nigra and negative connectivity to the occipital lobe
 - We speculate disruption of the reward processing in the STN/SN and overactivation of the occipital lobe may lead to a pathological obsession over self image and eating disorders.
 - This brain circuit aligns with neuroimaging correlates of eating and therapeutic targets used to treat eating disorders.

CONCLUSION
Lesions causing eating disorders map to a **brain circuit** involving the **STN/SN** and **occipital lobe**. This **circuit** may have **therapeutic value** as a **neuromodulation target** for patients with **eating disorders**.

• Eve Cohen*, Frederic L.W.V.J. Schaper*, Christopher Lin, Joseph Taylor, Michael D. Fox

DBS sites



Ablation targets

