

## Thursday

### **Extracting thalamic subregional volumes from structural and diffusion MRIs: application to the GENFI cohort**

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#### *State of the art*

The thalamus is affected in all forms of frontotemporal dementia (FTD), with common and distinct patterns of involvement among thalamic subregions across FTD forms. Detection of these patterns can offer insights into underlying pathology and clinico-anatomical correlations. Crucially, volumetric measures of thalamic subregions may have the potential to serve as imaging biomarkers in future trials. However, these measures may be affected by the imaging tools used. Studies in FTD have, to date, applied thalamus segmentation tools to structural MRI data only.

#### *Methodology*

We recently developed a novel thalamus segmentation tool, which jointly incorporates information from structural and diffusion MRI. This tool may therefore offer improved detection and characterisation of thalamic involvement in patient populations of interest. We are applying the tool to investigate changes in thalamic subregional volumes in symptomatic and presymptomatic carriers of pathogenic *C9orf72*, *MAPT* and *GRN* mutations in the Genetic FTD Initiative (GENFI) for whom suitable 3T T1-weighted and diffusion MRI data are available.

#### *Results*

We will present results of thalamic subregional volumetric involvement in mutation carriers at different disease stages compared to non-carriers. We aim to address whether:

1. Subregional changes are detectable presymptomatically
2. Subregions are exclusively or commonly affected in different genetic groups
3. There is an added value of the novel tool compared with conventional thalamic segmentation methods.

#### *Conclusions*

Our findings will likely help support and extend the existing knowledge on thalamic involvement in genetic FTD, and demonstrate the utility of this novel segmentation tool in genetic FTD.

### **Conflicts of interest**

Nothing to declare