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Aberrant dynamic functional connectivity of thalamocortical circuitry in major depressive disorder

Key words: Major depressive disorder, Resting-state functional magnetic resonance imaging, Thalamocortical circuitry, Dynamic functional connectivity, Dynamic laterality

Research Summary

This study mainly focused on the changes in dynamic functional connectivity (dFC) of thalamocortical circuitry in major depressive disorder in the following aspects:

- **Temporal properties of thalamocortical dFC state**
- **dFC variability of thalamocortical connectivity**
- **Laterality dynamics of thalamocortical system**

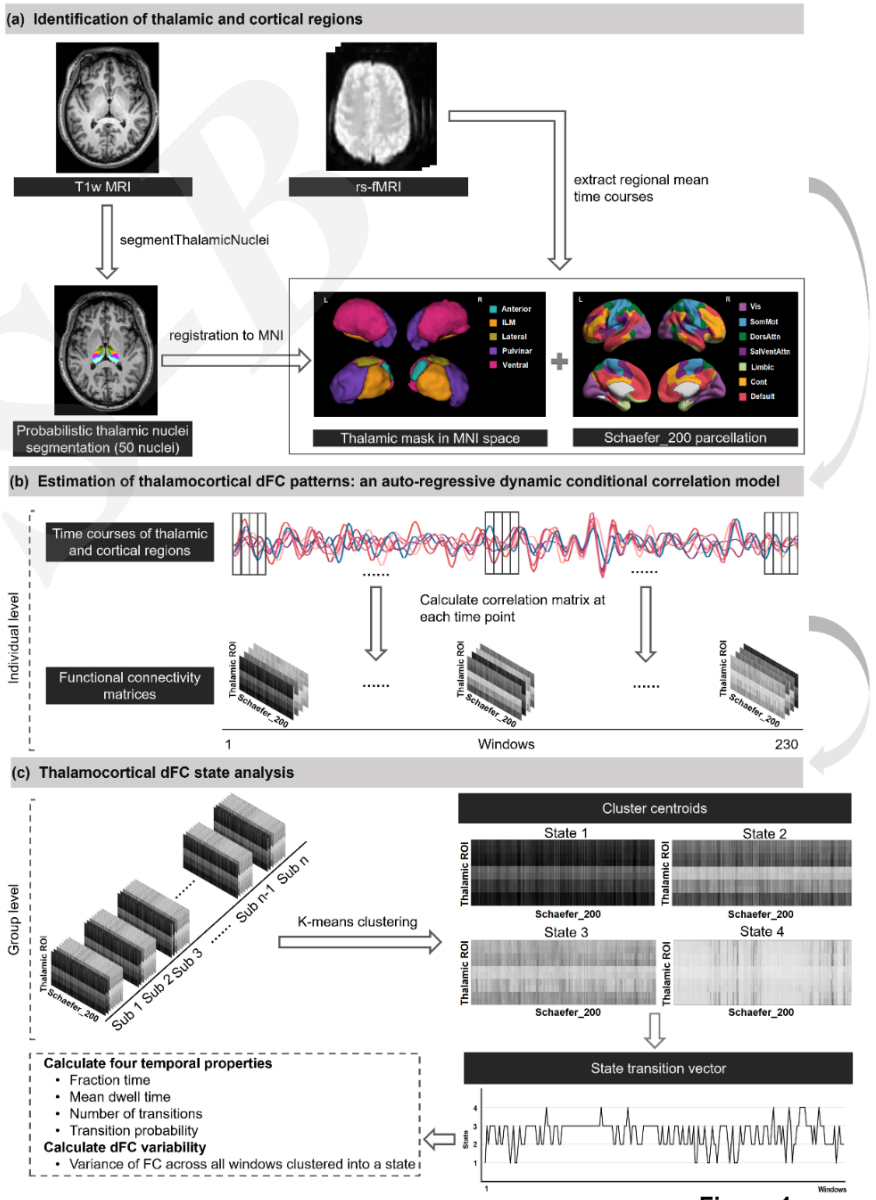


Figure 1

Research Summary

The heterogeneous changes were identified between the thalamus and both primary and higher-order cortical networks that may serve as a potential neural mechanism resulting in the deficits of sensory and cognitive processing in major depressive disorder.

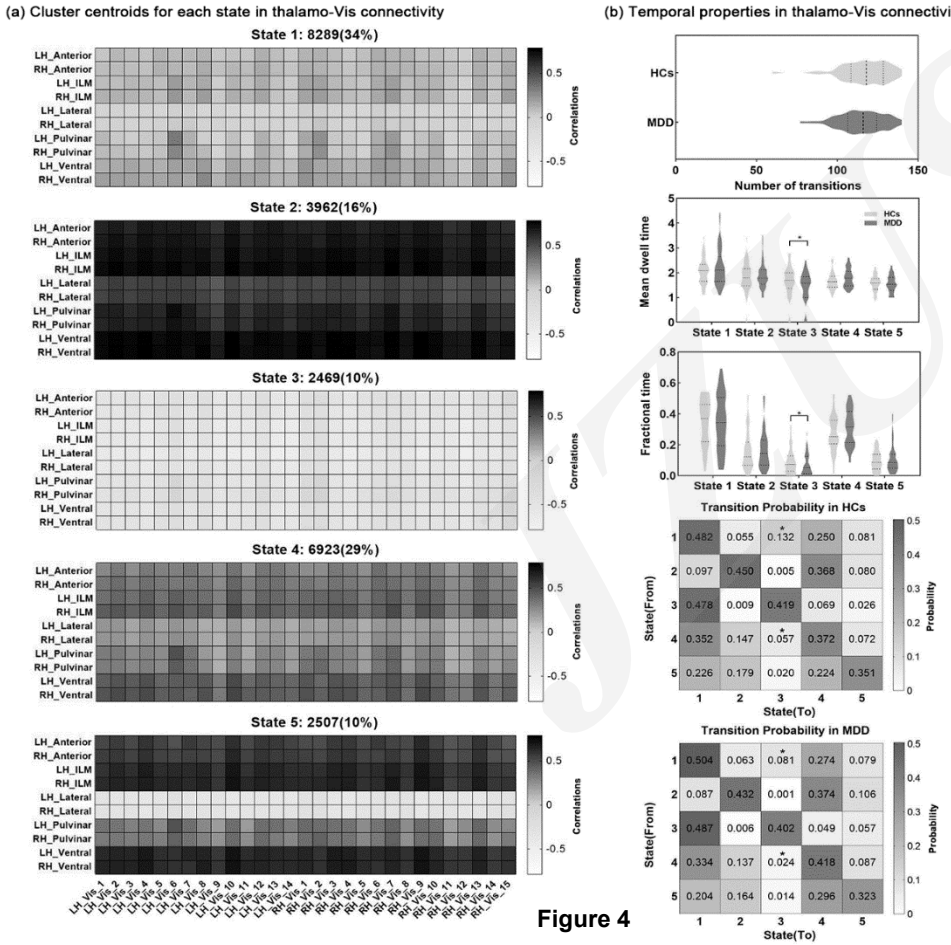


Figure 4

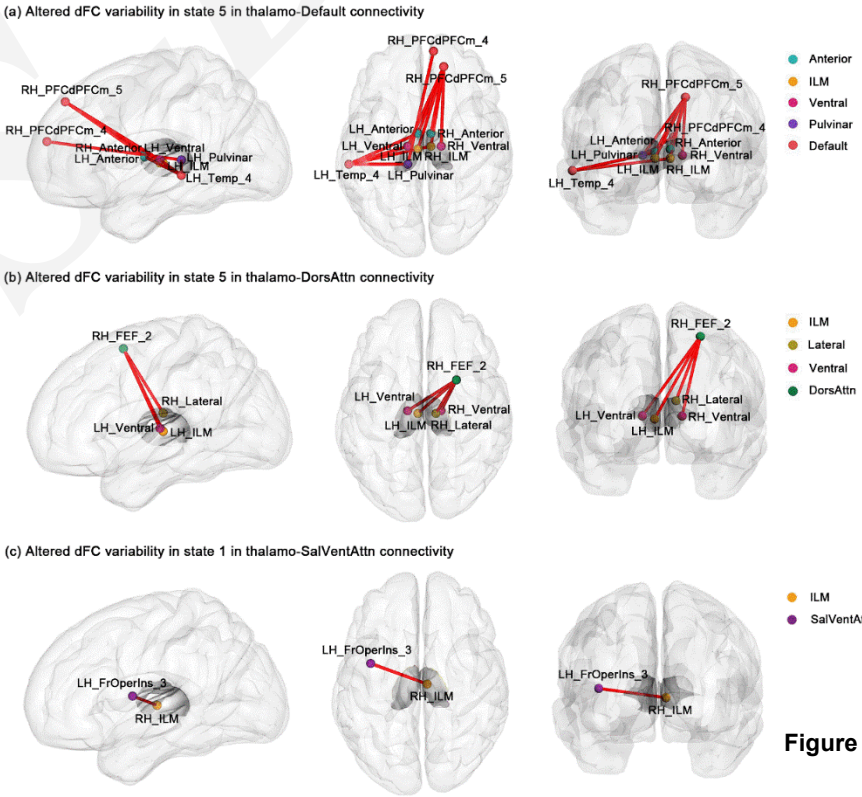
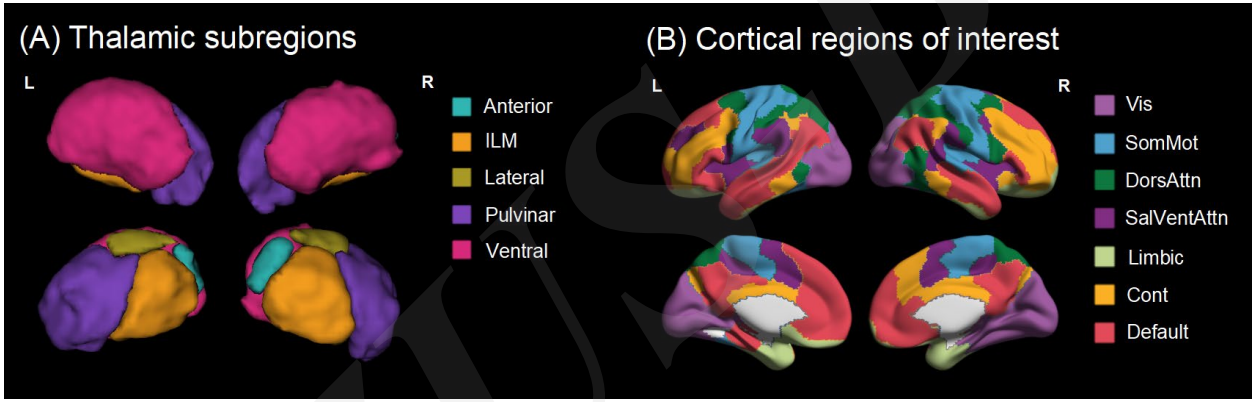


Figure 6

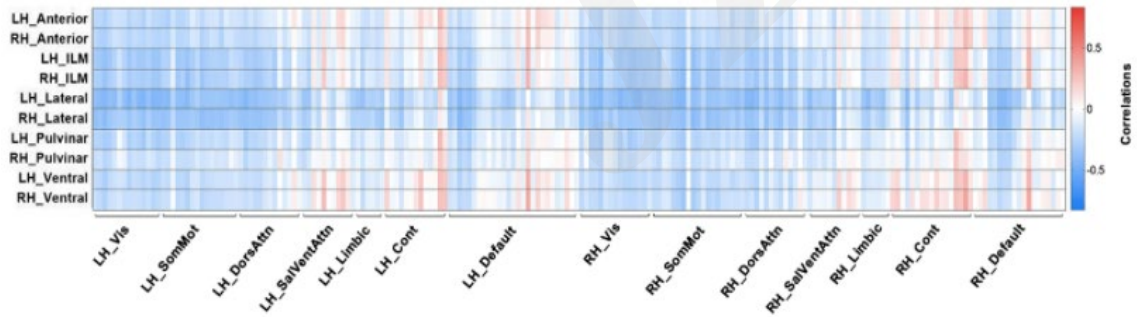
- Figure 4 represents the aberrant temporal properties of thalamo-Vis circuitry.
- Figure 6 represents the aberrant dFC variability between the thalamus and higher-order cortical networks.

Innovation points

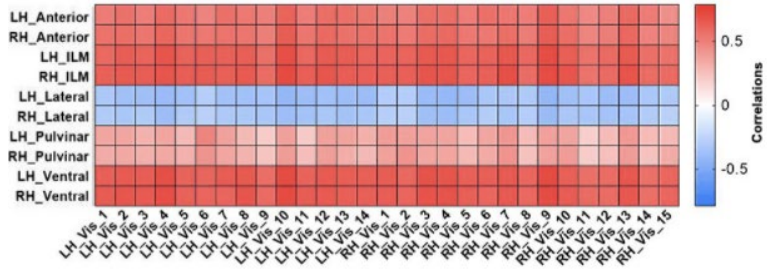
- **Analysis of the thalamocortical dFC patterns between five thalamic subregions in each hemisphere and seven cortical subnetworks.**



- **A Comprehensive study of dFC patterns in thalamocortical circuitry at global and local levels.**



dFC analysis between the thalamic subregions and all cortical subnetworks



dFC analysis between the thalamic subregions and each cortical subnetworks

Innovation points

A series of comprehensive tables and figures were generated to summarize the aberrant dFC patterns of thalamocortical circuitry in major depressive disorder.

Table 1 | Demographic and clinical characteristics of participants.

Table 2 | Summary of the thalamo-subnetwork connectivity characteristics of all states.

Table 3 | Summary of results.

Figure 1 | The pipeline of dFC analysis in thalamocortical connectivity.

Figure 2 | Temporal properties of thalamocortical connectivity.

Figure 3 | Results of dynamic laterality analysis.

Figure 4 | Temporal properties of thalamo-Vis connectivity.

Figure 5 | Temporal properties of thalamo-SomMot connectivity.

Figure 6 | Thalamo-subnetwork connectivity with significant variability changes in major depressive disorder.

Figure 7 | Correlations between altered dFC variability and the HAMD score in major depressive disorder.