Supplementary Materials

Supplementary Tables

Table S1 Thalamic nuclei groups used for analysis

Group	Nucleus
Anterior	Anteroventral
Lateral	Laterodorsal
	Lateral posterior
Ventral	Ventral anterior
	Ventral anterior magnocellular
	Ventral lateral anterior
	Ventral lateral posterior
	Ventral posterolateral
	Ventromedial
ILM	Central medial
	Central lateral
	Paracentral
	Centromedian
	Parafascicular
	Paratenial
	Reuniens (medial ventral)
	Mediodorsal medial magnocellular
	Mediodorsal lateral parvocellular
Pulvinar	Pulvinar anterior
	Pulvinar medial
	Pulvinar lateral
	Pulvinar inferior

Anterior: anterior thalamus; Lateral: lateral thalamus; Ventral: ventral thalamus; ILM: intralaminar/medial thalamus; Pulvinar: pulvinar thalamus.

Table S2 Correspondence of thalamocortical FC patterns in 10 thalamic subregions between smoothing kernels of 6 and 8 mm

Thalamic subregion	*r*	*P*
LH_Anterior	0.992	<0.001
RH_Anterior	0.992	<0.001
LH_ILM	0.998	<0.001
RH_ILM	0.999	<0.001
LH_Lateral	0.972	<0.001
RH_Lateral	0.973	<0.001
LH_Pulvinar	0.997	<0.001
RH_Pulvinar	0.997	<0.001
LH_Ventral	0.999	<0.001
RH_Ventral	0.999	<0.001

r and *P* values were obtained via the Pearson's correlation analysis. Results were corrected via the FDR method at the level of q=0.05. FDR: false discovery rate; LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus.

Table S3 Results of four temporal properties in the sliding window analysis

Temporal property	State	HCs (*n*=57)	MDD (*n*=48)	*P*
Mean dwell time	State 1	22.940±40.251	13.524±31.332	0.517
	State 2	15.761±26.070	15.776±33.396	0.916
	State 3	22.332±23.017	23.387±27.022	0.916
	State 4	22.763±23.957	28.025±23.569	0.517
Fraction time	State 1	0.216±0.290	0.102±0.203	0.102
	State 2	0.156±0.256	0.138±0.231	0.699
	State 3	0.278±0.198	0.343±0.255	0.278
	State 4	0.350±0.263	0.417±0.286	0.299
Number of transitions		6.771±3.541	6.229±3.164	0.425
Transition probability	State 1 to state 1	0.960±0.078	0.950±0.087	0.941
	State 2 to state 1	0	0	-
	State 3 to state 1	0.001±0.009	0	-
	State 4 to state 1	0.021±0.032	0.008±0.011	0.079
	State 1 to state 2	0	0	-
	State 2 to state 2	0.957±0.150	0.0.959±0.146	0.941
	State 3 to state 2	0.016±0.033	0.012±0.018	0.941
	State 4 to state 2	0	0	-
	State 1 to state 3	0.001±0.003	0	-
	State 2 to state 3	0.043±0.146	0.041±0.146	0.941
	State 3 to state 3	0.944±0.056	0.945±0.068	0.941
	State 4 to state 3	0.050±0.136	0.051±0.146	0.941
	State 1 to state 4	0.039±0.078	0.050±0.087	0.941
	State 2 to state 4	0	0	-
	State 3 to state 4	0.038±0.052	0.043±0.068	0.941
	State 4 to state 4	0.929±0.135	0.0941±0.144	0.941

Data were displayed as mean±standard deviation (SD). *P* value was obtained using the two-sample *t*-test. Results were corrected via the FDR method at the level of *q*=0.05. FDR: false discovery rate; HCs: healthy controls; MDD: major depressive disorder.

Supplementary Figures

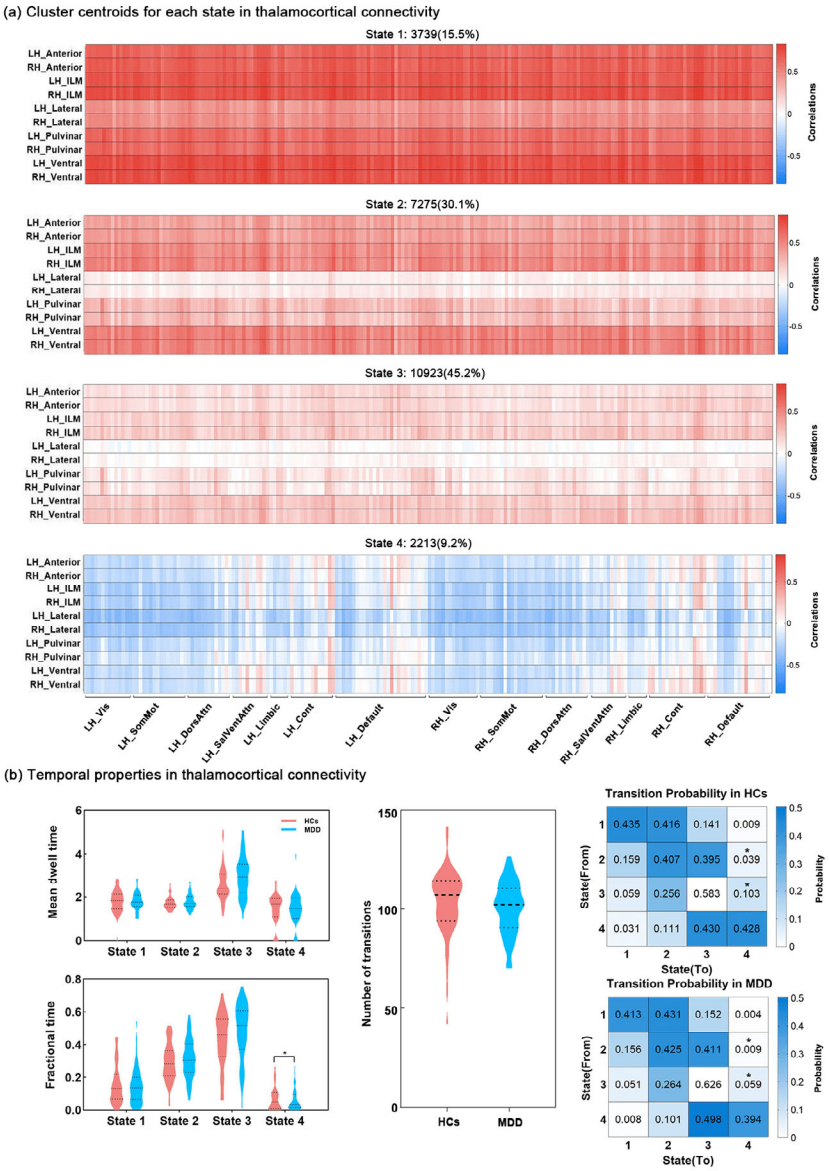

Fig. S1 Results of temporal properties in thalamocortical connectivity. (a) Cluster centroids for each state in thalamocortical connectivity. The total number and percentage of state occurrences are listed above each centroid. (b) Temporal properties of thalamocortical dFC states. Asterisks represent significant between-group differences at P_{FDR}<0.05. dFC: dynamic functional connectivity; FDR: false discovery rate; LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; Vis: visual network; SomMot: somatomotor network; DorsAttn: dorsal attention network; SalVentAttn: salient ventral attention network; Limbic: limbic network; Cont: executive control network; Default: default mode network; HCs: healthy controls; MDD: major depressive disorder.

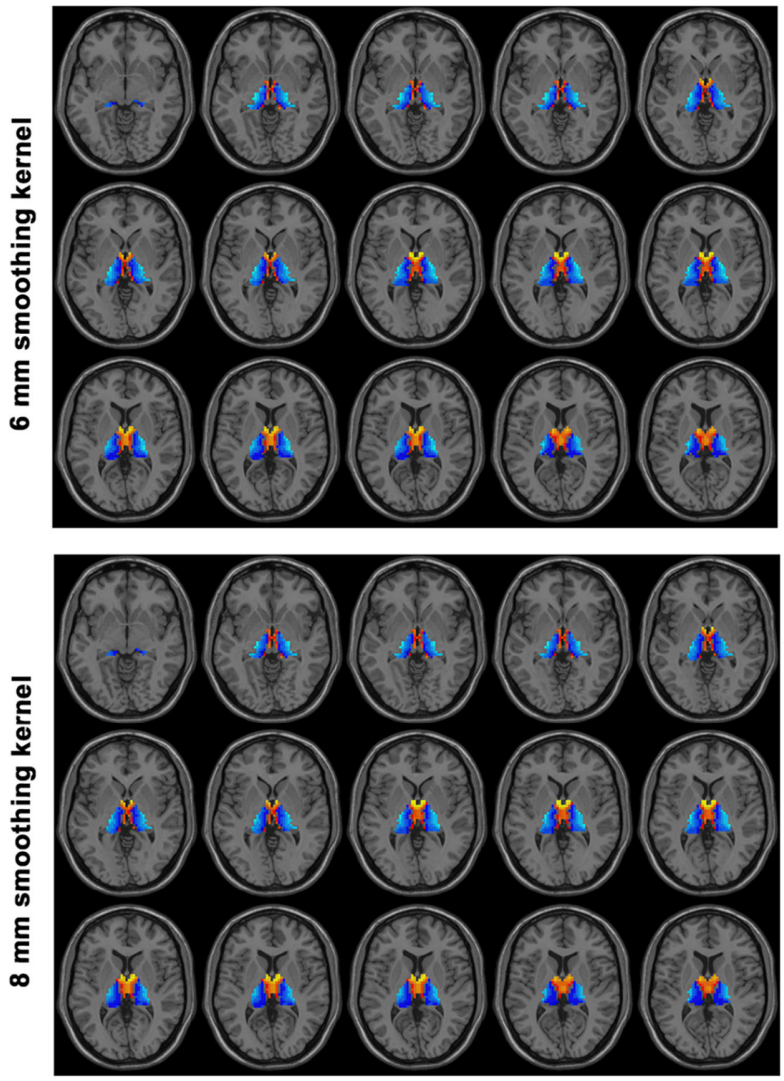

Fig. S2 Results of one sample *t*-test of the amplitude of low-frequency fluctuation (ALFF) in 6 and 8 mm smoothing kernels. The significant threshold was set to *P*<0.001 at the voxel level (one-sample *t*-test), followed by Gaussian random field correction at the cluster level of *P*<0.05.

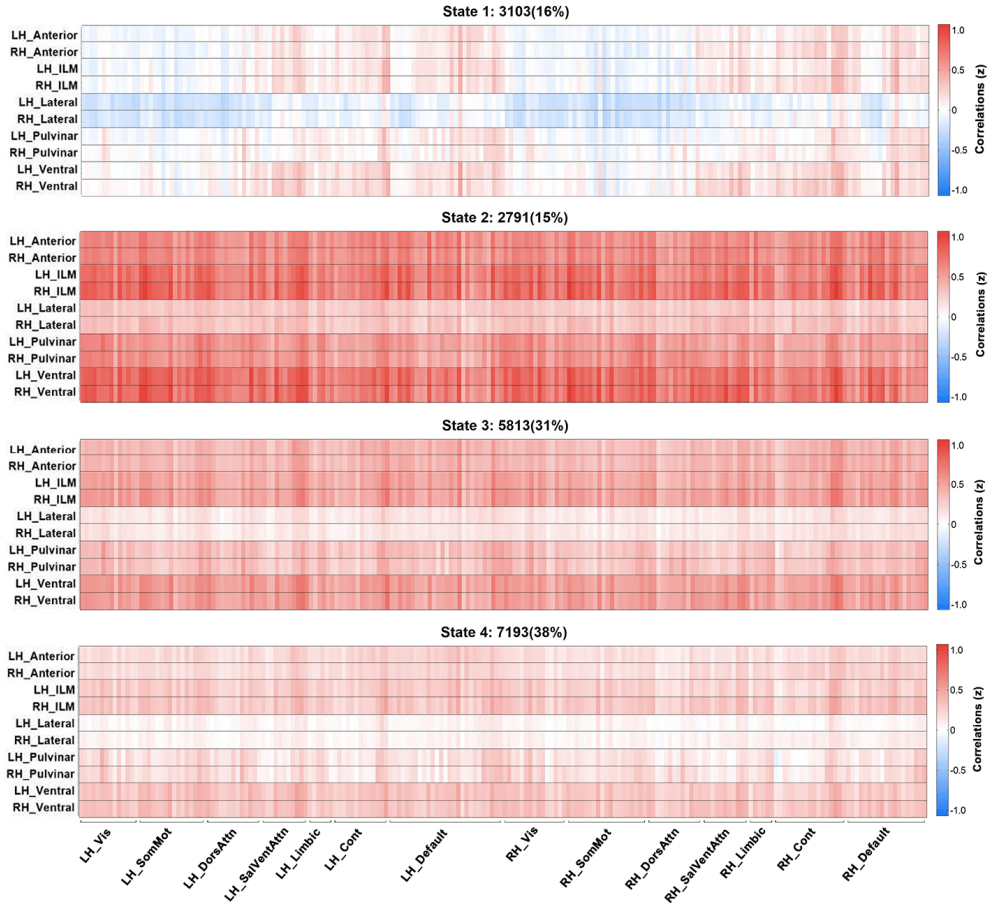

Fig. S3 Cluster centroids for each state in thalamocortical connectivity in the sliding window analysis. The total number and percentage of state occurrences are listed above each centroid. LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; Vis: visual network; SomMot: somatomotor network; DorsAttn: dorsal attention network; SalVentAttn: salient ventral attention network; Limbic: limbic network; Cont: executive control network; Default: default mode network.

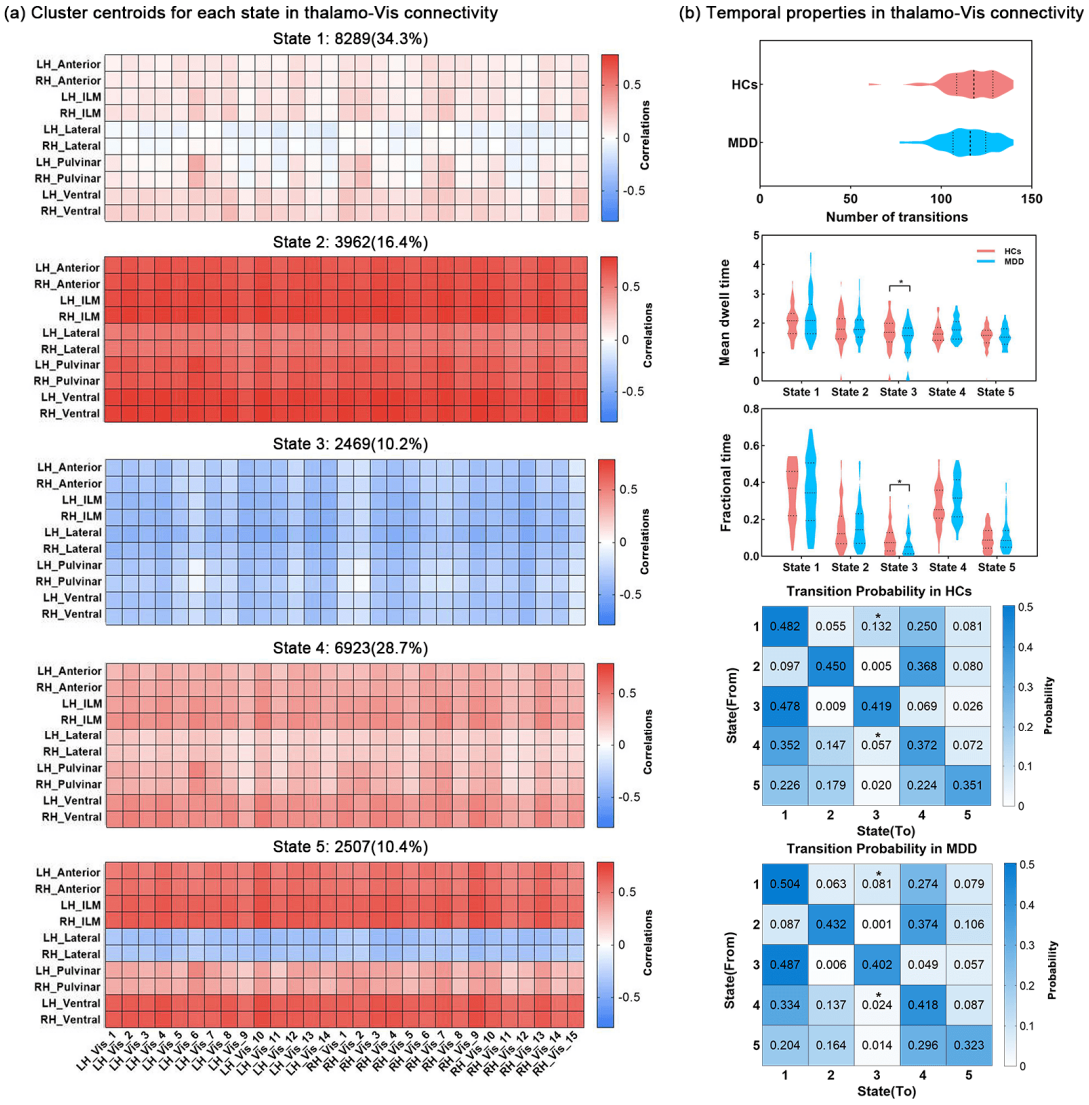

Fig. S4 Results of temporal properties in thalamo-Vis connectivity. (a) Cluster centroids for each state in thalamo-Vis connectivity. The total number and percentage of state occurrences are listed above each centroid. (b) Temporal properties of dFC states in thalamo-Vis connectivity. Asterisks indicate significant between-group differences at P_{FDR}<0.05. dFC: dynamic functional connectivity; FDR: false discovery rate; LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; Vis: visual network; Vis_[*i*]: the *i*th region of the visual network; HCs: healthy controls; MDD: major depressive disorder.

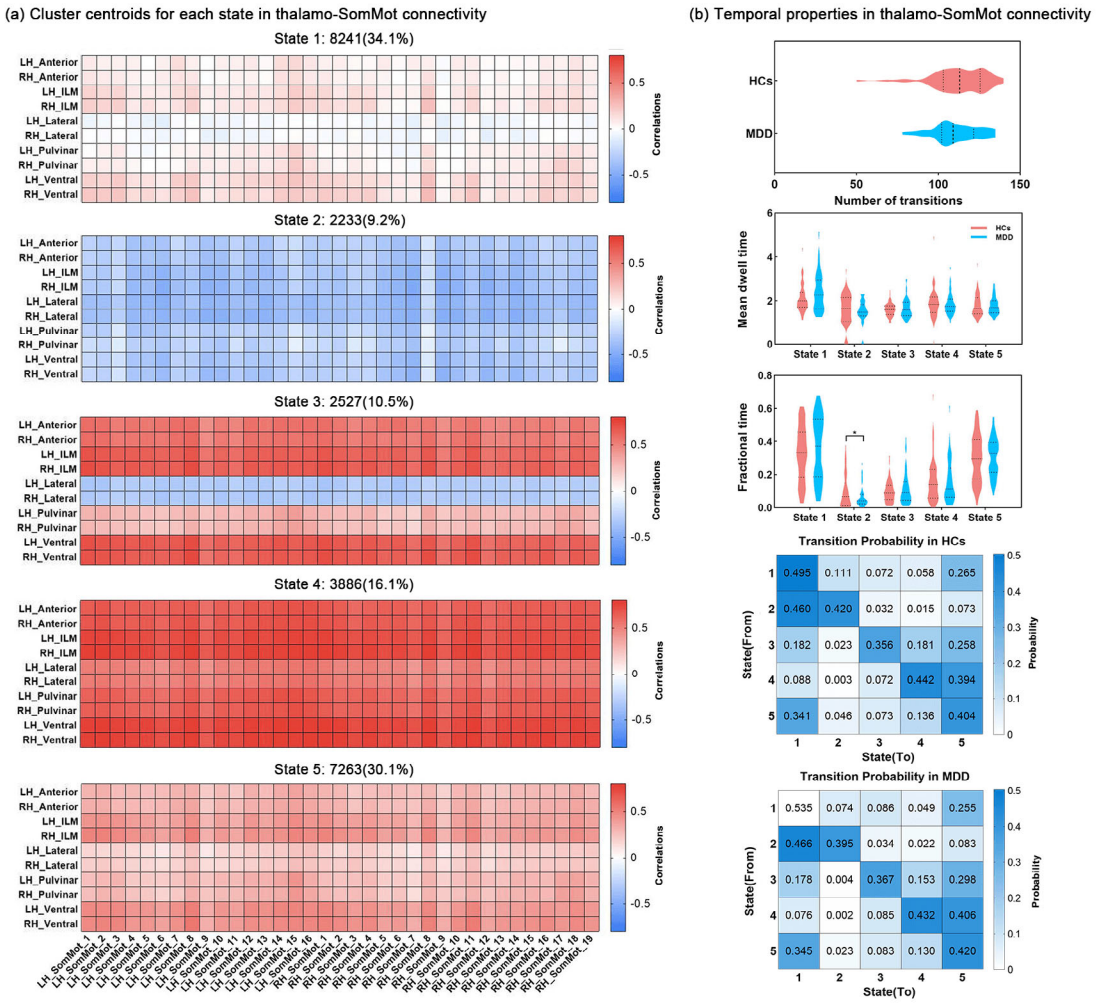

Fig. S5 Results of temporal properties in thalamo-SomMot connectivity. (a) Cluster centroids for each state in thalamo-SomMot connectivity. The total number and percentage of state occurrences are listed above each centroid. (b) Temporal properties of dFC states in thalamo-SomMot connectivity. Asterisks indicate significant between-group differences at P_{FDR}<0.05. dFC: dynamic functional connectivity; FDR: false discovery rate; LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; SomMot: somatomotor network; SomMot_[*i*]: the *i*th region of the somatomotor network; HCs: healthy controls; MDD: major depressive disorder.

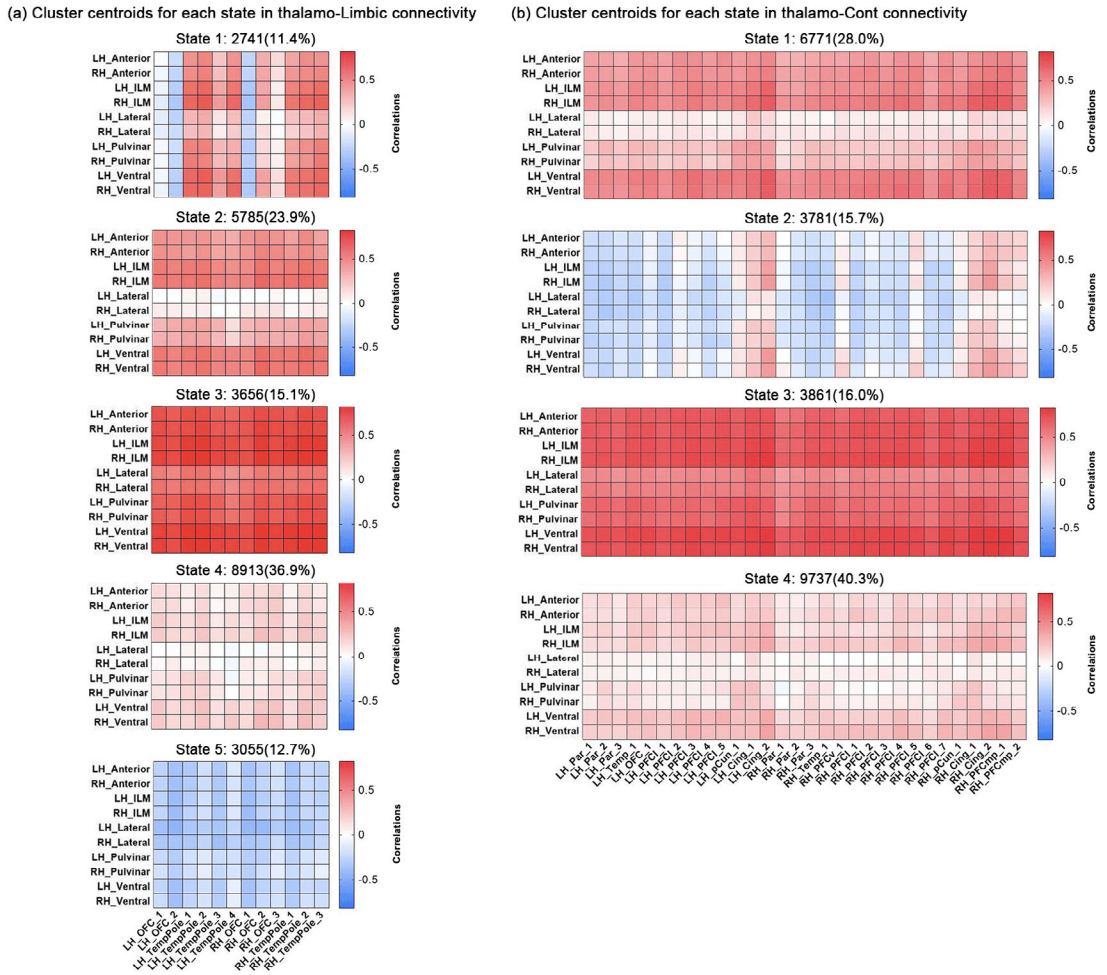

Fig. S6 Cluster centroids for each state in thalamo-Limbic connectivity (a) and thalamo-Cont connectivity (b). The total number and percentage of state occurrences are listed above each centroid. LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; Limbic: limbic network; Cont: executive control network; OFC_[*i*]: the *i*th region of the orbital frontal cortex; TempPole_[*i*]: the *i*th region of the temporal pole; Par_[*i*]: the *i*th region of the parietal cortex; Temp_[*i*]: the *i*th region of the temporal cortex; PFCl_[*i*]: the *i*th region of the lateral prefrontal cortex; pCun_[*i*]: the *i*th region of the precuneus; Cing_[*i*]: the *i*th region of the cingulate; PFCv_[*i*]: the *i*th region of the ventral prefrontal cortex; PFCmp_[*i*]: the *i*th region of the medial posterior prefrontal cortex.

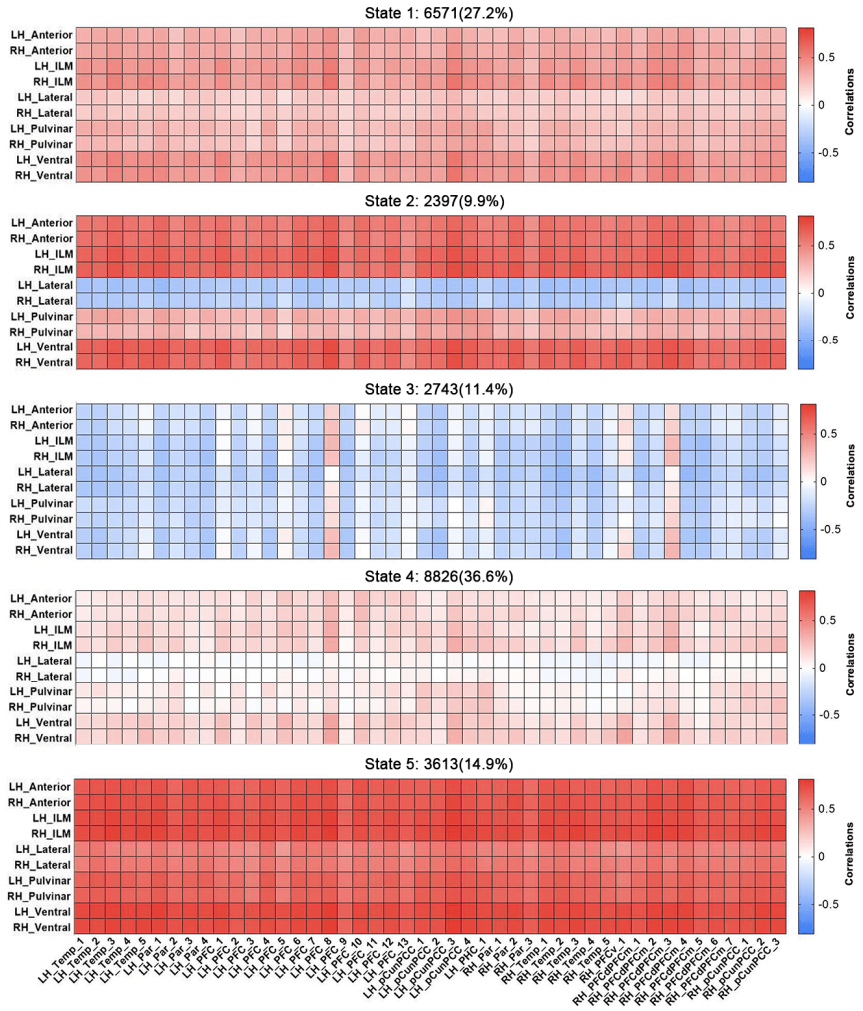

Fig. S7 Cluster centroids for each state in thalamo-Default connectivity. The total number and percentage of state occurrences are listed above each centroid. LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; Default: default mode network; Par_[*i*]: the *i*th region of the parietal cortex; Temp_[*i*]: the *i*th region of the temporal cortex; PFC_[*i*]: the *i*th region of the prefrontal cortex; pCunPCC_[*i*]: the *i*th region of the precuneus/posterior cingulate; PHC_[*i*]: the *i*th region of the parahippocampal; PFCv_[*i*]: the *i*th region of the ventral prefrontal cortex; PFCdPFCm_[*i*]: the *i*th region of the dorsal/medial prefrontal cortex.

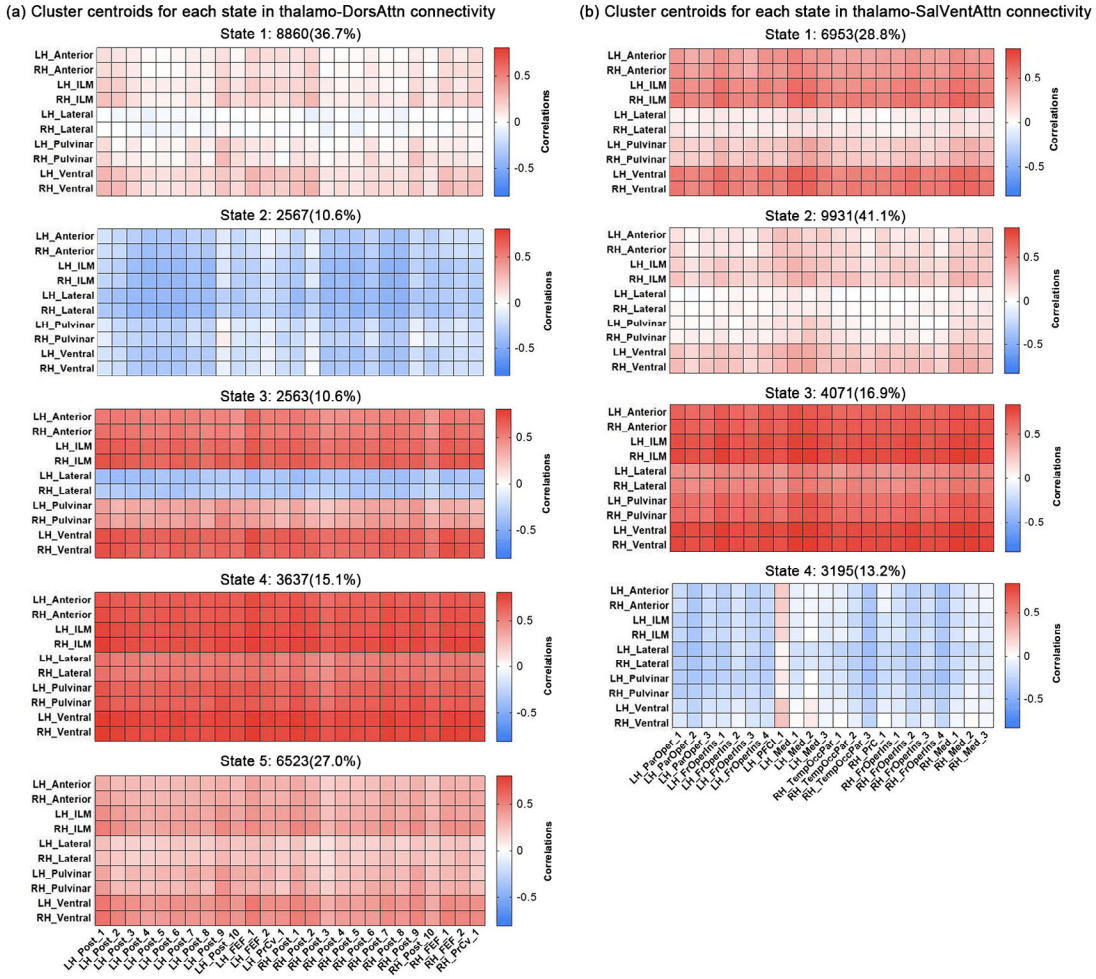

Fig. S8 Cluster centroids for each state in thalamo-DorsAttn connectivity (a) and thalamo-SalVentAttn connectivity (b). The total number and percentage of state occurrences are listed above each centroid. LH: left hemisphere; RH: right hemisphere; Anterior: anterior thalamus; ILM: intralaminar/medial thalamus; Lateral: lateral thalamus; Pulvinar: pulvinar thalamus; Ventral: ventral thalamus; DorsAttn: dorsal attention network; SalVentAttn: salient ventral attention network; Post_[*i*]: the *i*th region of the posterior cortex; FEF_[*i*]: the *i*th region of the frontal eye fields; PrCv_[*i*]: the *i*th region of the precentral ventral gyrus; ParOper_[*i*]: the *i*th region of the parietal operculum; FrOperIns_[*i*]: the *i*th region of the frontal operculum insula; PFCl_[*i*]: the *i*th region of the lateral prefrontal cortex; Med_[*i*]: the *i*th region of the medial cortex; Prc_[*i*]: the *i*th region of the precentral gyrus.