

Date: 30 Apr 2015 – Supplement Tables for:

Functional topography of the thalamocortical system in human

Rui Yuan, Xin Di, Paul A. Taylor, Suril Gohel, Yuan-Hsiung Tsai, Bharat B. Biswal

<http://link.springer.com/article/10.1007%2Fs00429-015-1018-7> – link to original supplemental materials file:

429_2015_1018_MOESM1_ESM.docx can be found there. This version contains only the tables. -jch

Brain networks	Voxel size	Peak voxel (Z)	MNI coordinate			side	Identified brain regions
			x	y	z		
Default Mode Network	5560	17.93	0	51	27	-	Medial Frontal Gyrus
	726	18.83	-45	-57	30	L	Angular Gyrus
	699	16.91	0	-48	30	L	Posterior Cingulate Cortex
	494	7.77	63	-3	-24	R	middle temporal Gyrus
	416	11.07	30	-78	-33	R	Cerebellum; Lobule VIIa crus
	357	13.15	54	-63	36	R	Angular Gyrus
	259	6.04	-36	-45	57	L	Superior Parietal Lobule
	247	7.19	36	21	18	R	Inferior frontal Gyrus
	228	6.49	36	-36	51	R	Inferior parietal Lobule
200	9.12	-27	-81	-33	L	Cerebellum; Lobule VIIa crus	
Posterior Default Mode Network	2049	27.15	-6	-75	39	L	Precuneus
	472	12.39	-33	-60	48	L	Inferior parietal lobule
	324	8.36	39	-57	54	R	Inferior parietal lobule
Dorsal-attention Network	3546	22.19	33	-75	27	R	Middle Occipital Gyrus
	3016	20.83	-27	-75	27	L	Middle Occipital Gyrus
	510	11.47	27	-9	54	R	Middle Frontal Gyrus
	287	9.046	-24	-9	54	L	Middle Frontal Gyrus
Left Executive Network	3741	19.98	-51	12	39	L	Middle Frontal Gyrus
	1466	18.88	-30	-60	45	L	Superior Parietal Lobule
	747	14.56	-54	-51	-9	L	Middle Temporal Gyrus
	743	11.2	30	-63	-30	R	Cerebellum; Declive
	565	9.38	48	33	21	R	Middle Frontal Gyrus
	406	9.51	39	-60	45	R	Inferior Parietal Lobule
Right Executive Network	4454	18.81	42	21	51	R	Middle Frontal Gyrus
	2560	23.83	48	-51	42	R	Inferior Parietal Lobule
	954	12.71	-9	-81	-27	L	cerebellum; Lobule VII Crus
	392	10.1	-51	-51	48	L	Inferior Parietal Lobule
	213	7.24	-39	54	-6	L	Middle Orbital Gyrus
Motor Network	4314	18.72	3	-30	63	R	Paracentral Lobule
	382	9.83	36	-27	21	R	Insula
	322	7.96	-33	-30	21	L	Insula
Auditory Network	2846	14.15	-57	-51	12	L	Middle Temporal Gyrus
	2596	15.96	48	-30	0	R	Superior Temporal Gyrus
	446	9.52	0	12	63	-	Superior Frontal Gyrus
	209	6.08	42	-57	-18	R	Fusiform
	204	7.29	9	-54	42	R	Precuneus
Lateral Visual Network	3222	19.49	-24	-96	6	L	Middle Occipital Gyrus
Medial Visual Network	4129	25.5	9	-72	15	R	Calcarine Gyrus
Salience Network	4983	17.85	-27	51	18	L	Middle Frontal Gyrus
	775	11.23	-3	-66	57	L	precuneus
	394	9.53	33	-57	-30	R	Cerebellum; Culmen
	348	11.65	-42	15	0	L	Insula

Table S1: For each brain network as shown in fig 3, the coordinates and z-score of peak values for each network were listed in this table.

Corresponding Network	Voxel size	Peak voxel (Z)	MNI coordinate			side
			x	y	z	
DMN	45	6.41	-6	-15	15	L
	16	5.94	-6	-30	6	L
post-DMN	270	8.81	12	-27	12	R
	3	2.51	-15	-27	-3	L
Dorsal-Attention	68	8.32	18	-30	6	R
	45	6.82	-15	-27	12	L
Left Executive	76	8.44	-9	-15	15	L
	5	4,26	-12	-36	0	L
Right Executive	108	9.3	-6	-12	18	R
	2	3.55	-3	-6	0	L
	2	3.55	-9	-6	0	L
Motor	60	10.48	-12	-24	6	L
	58	11.77	12	-21	3	R
Auditory	3	4.42	-9	30	3	L
	2	3.7	12	30	6	R
Lateral Visual	33	10.61	-18	-30	-3	L
	29	10.26	18	-30	-3	R
Medial Visual	101	10.31	21	-27	3	R
	51	11.27	-18	-30	0	L
	44	5.04	-6	-18	3	L
Salience	68	8.85	-9	-3	12	L
	45	6.01	15	-9	12	R
	4	3.64	9	-12	0	R
	2	4.83	-3	-21	0	L

Table S2: The coordinates and cluster size of thalamic sub-divisions.

Left		DMN	PDMM	ATT	LEXE	REXE	MOTOR	Auditory	LV	MV	SAL
Anterior Nucleus	'AD'	0	0	0	0	0	0	0	0	0	0
	'AM'	0	0	0	0	0	0	0	0	0	0
	'AV'	2	1	0	6	0	0	0	0	0	5
Intralaminar Nucleus	'CL'	7	16	0	13	0	8	0	0	10	4
	'CM'	0	0	0	0	0	8	0	0	8	1
	'CeM'	0	2	0	0	2	0	0	0	0	0
	'Pf'	0	1	0	0	0	0	0	0	3	1
	'Hb'	0	1	0	0	0	0	0	0	2	1
Lateral Dorsal Nucleus	'LD'	2	6	1	5	0	0	0	0	0	1
	'MDmc'	4	7	0	0	0	0	0	0	2	0
Mediodorsal Nucleus	'MDpc'	14	26	0	13	0	6	0	0	21	3
	'MGN'	0	1	0	0	0	0	0	1	1	0
Ventral Anterior Nucleus	'VAmc'	1	0	0	0	0	0	0	0	0	1
	'VApc'	2	1	0	4	2	0	0	0	0	11
	'PuA'	0	0	1	0	0	7	0	0	1	0
Pulvinar Nucleus	'PuI'	0	0	0	0	0	0	0	0	0	0
	'PuL'	0	2	2	0	0	0	0	2	3	0
	'PuM'	10	34	29	6	0	17	3	20	28	0
	'MV'	0	0	0	0	0	0	0	0	0	0
Ventral Lateral Nucleus	'VLa'	0	1	0	2	0	0	0	0	2	6
	'VLpd'	5	4	0	14	0	0	0	0	0	21
	'VLpv'	1	3	0	7	0	0	0	0	6	10
	'VM'	0	0	0	0	1	0	0	0	0	3
Ventral Posterior Nucleus	'VPI'	0	0	0	0	0	1	0	0	3	0
	'VPLa'	0	0	0	0	0	0	0	0	0	0
	'VPLp'	0	1	0	2	0	8	0	0	6	0
	'VPM'	0	0	0	0	0	3	0	0	2	0
	'LGNmc'	0	0	0	0	0	0	0	0	0	0
Lateral Geniculate Nucleus	'LGNpc'	0	0	0	0	0	0	0	0	0	0
	'Po'	0	1	0	0	0	2	0	0	2	0
	'LP'	0	4	6	1	0	8	0	0	1	1
	'Li'	0	0	0	0	0	1	0	0	2	0
	'Pv'	0	0	0	0	0	0	0	0	0	0
	'RN'	0	0	0	0	0	0	0	0	0	0
	'SG'	0	2	0	0	0	0	0	2	2	0
	'STh'	0	0	0	0	0	0	0	0	0	0
	'mtt'	1	0	0	0	0	0	0	0	0	1
	'sPF'	0	0	0	0	0	0	0	0	0	0
	'thalamus_body'	1	5	2	3	0	0	0	1	1	2

Table S3: the detailed identification of thalamic nuclei of each network related thalamic subdivisions on the left. Notably, there are overlaps between certain atlas nuclei. Considering the voxel size of our result, we thought it is better to keep the original comparison without considering the overlaps between the atlas overlaps.

Right		DMN	PDN	ATT	LEXE	REXE	MOTOR	Auditory	LV	MV	SAL
Anterior Nucleus	'AD'	0	0	0	0	0	0	0	0	0	0
	'AM'	0	0	0	0	0	0	0	0	0	0
	'AV'	0	4	0	0	8	0	0	0	0	2
Intralaminar Nucleus	'CL'	0	21	3	0	14	7	0	0	12	2
	'CM'	0	0	0	0	0	8	0	0	6	0
	'CeM'	0	2	0	0	0	0	0	0	0	0
	'Pf'	0	0	0	0	0	0	0	0	1	0
Lateral Dorsal Nucleus	'Hb'	0	1	0	0	0	0	0	0	2	0
	'LD'	0	7	1	0	7	0	0	0	0	1
Mediodorsal Nucleus	'MDmc'	4	7	0	0	0	0	0	0	0	0
	'MDpc'	3	31	1	0	15	5	0	0	12	0
Ventral Anterior Nucleus	'MGN'	0	0	0	0	0	0	0	0	0	0
	'VAmc'	0	0	0	0	1	0	0	0	0	1
	'VApc'	0	4	0	0	13	0	0	0	0	9
Pulvinar Nucleus	'PuA'	0	0	2	0	0	8	0	0	2	0
	'PuI'	0	0	0	0	0	0	0	0	0	0
	'PuL'	0	1	3	0	0	0	0	1	3	0
	'PuM'	0	37	36	0	12	12	2	24	36	0
Ventral Lateral Nucleus	'MV'	0	0	0	0	0	0	0	0	0	0
	'VLa'	0	0	0	0	4	0	0	0	1	8
	'VLpd'	0	12	0	0	16	0	0	0	2	20
	'VLpv'	0	5	0	0	9	1	0	0	10	4
	'VM'	0	0	0	0	2	0	0	0	0	2
Ventral Posterior Nucleus	'VPI'	0	0	0	0	0	1	0	0	1	0
	'VPLa'	0	0	0	0	0	0	0	0	0	0
	'VPLp'	0	1	7	0	1	13	0	0	9	0
	'VPM'	0	0	0	0	0	6	0	0	1	0
Lateral Geniculate Nucleus	'LGNmc'	0	0	0	0	0	0	0	0	0	0
	'LGNpc'	0	0	0	0	0	0	0	0	0	0
thalamus body'	'Po'	0	0	1	0	0	0	0	2	2	0
	'LP'	0	12	21	0	7	8	0	1	9	0
	'Li'	0	0	1	0	0	1	0	0	3	0
	'Pv'	0	0	0	0	0	0	0	0	0	0
	'RN'	0	0	0	0	0	0	0	0	0	0
	'SG'	0	0	0	0	0	0	0	1	1	0
	'STh'	0	0	0	0	0	0	0	0	0	0
	'mtt'	0	1	0	0	1	0	0	0	0	0
	'sPf'	0	0	0	0	0	0	0	0	0	0

Table S4: the detailed identification of thalamic nuclei of each network related thalamic subdivisions on the right. Notably, there are overlaps between certain atlas nuclei. Considering the voxel size of our result, we thought it is better to keep the original comparison without considering the overlaps between the atlas overlaps.

Left		DMN	Post DMN	ATT	LEXE	REXE	MOTOR	Auditory	LV	MV	SAL
Anterior Nucleus	'AD'	0	0	0	0	0	0	0	0	0	0
	'AM'	0	0	0	0	0	0	0	0	0	0
	'AV'	0.182	0.091	0	0.545	0	0	0	0	0	0.455
Intralaminar Nucleus	'CL'	0.233	0.533	0	0.433	0	0.267	0	0	0.333	0.133
	'CM'	0	0	0	0	0	0.667	0	0	0.667	0.083
	'CeM'	0	0.333	0	0	0.333	0	0	0	0	0
	'Pf'	0	0.100	0	0	0	0	0	0	0.300	0.100
Lateral Dorsal Nucleus	'Hb'	0	0.500	0	0	0	0	0	0	1.000	0.500
	'LD'	0.333	1.000	0.167	0.833	0	0	0	0	0	0.167
Mediodorsal Nucleus	'MDmc'	0.571	1.000	0	0	0	0	0	0	0.286	0
	'MDpc'	0.350	0.650	0	0.325	0	0.150	0	0	0.525	0.075
	'MGN'	0	0.167	0	0	0	0	0	0.167	0.167	0
Ventral Anterior Nucleus	'VAmc'	0.500	0	0	0	0	0	0	0	0	0.500
	'VApc'	0.100	0.050	0	0.200	0.100	0	0	0	0	0.550
Pulvinar Nucleus	'PuA'	0	0	0.143	0	0	1.000	0	0	0.143	0
	'Pul'	0	0	0	0	0	0	0	0	0	0
	'PuL'	0	0.133	0.133	0	0	0	0	0.133	0.200	0
	'PuM'	0.161	0.548	0.468	0.097	0	0.274	0.048	0.323	0.452	0
Ventral Lateral Nucleus	'MV'	0	0	0	0	0	0	0	0	0	0
	'VLa'	0	0.077	0	0.154	0	0	0	0	0.154	0.462
	'VLpd'	0.179	0.143	0	0.500	0	0	0	0	0	0.750
	'VLpv'	0.037	0.111	0	0.259	0	0	0	0	0.222	0.370
	'VM'	0	0	0	0	0.200	0	0	0	0	0.600
Ventral posterior Nucleus	'VPI'	0	0	0	0	0	0.200	0	0	0.600	0
	'VPLa'	0	0	0	0	0	0	0	0	0	0
	'VPLp'	0	0.045	0	0.091	0	0.364	0	0	0.273	0
	'VPM'	0	0	0	0	0	0.500	0	0	0.333	0
Lateral Geniculate Nucleus	'LGNmc'	0	0	0	0	0	0	0	0	0	0
	'LGNpc'	0	0	0	0	0	0	0	0	0	0
	'Po'	0	0.333	0	0	0	0.667	0	0	0.667	0
	'LP'	0	0.222	0.333	0.056	0	0.444	0	0	0.056	0.056
	'Li'	0	0	0	0	0	0.333	0	0	0.667	0
	'Pv'	0	0	0	0	0	0	0	0	0	0
	'RN'	0	0	0	0	0	0	0	0	0	0
	'SG'	0	1.000	0	0	0	0	0	1.000	1.000	0
	'STh'	0	0	0	0	0	0	0	0	0	0
	'mtt'	0.500	0	0	0	0	0	0	0	0	0.500
	'sPf'	0	0	0	0	0	0	0	0	0	0
		'thalamus_body'	0.077	0.385	0.154	0.231	0	0	0	0.077	0.077

Table S5: the detailed identification of thalamic nuclei of each network related thalamic subdivisions on the right. Each value demonstrates the percentage of overlaps between detected thalamic sub-divisions and the thalamic atlas (the overlap divided by the size of the thalamic nuclei atlas). In the result, we only reported those nuclei which have more 10% overlaps. Notably, there are overlaps between certain atlas nuclei. Considering the voxel size of our result, we thought it is better to keep the original comparison without considering the overlaps between the atlas overlaps.

Right		DMN	Post DMN	ATT	LEXE	REXE	MOTOR	Auditory	LV	MV	SAL
Anterior Nucleus	'AD'	0	0	0	0	0	0	0	0	0	0
	'AM'	0	0	0	0	0	0	0	0	0	0
	'AV'	0	0.400	0	0	0.800	0	0	0	0	0.200
Intralaminar Nucleus	'CL'	0	0.724	0.103	0	0.483	0.241	0	0	0.414	0.069
	'CM'	0	0	0	0	0	0.727	0	0	0.545	0
	'CeM'	0	0.250	0	0	0	0	0	0	0.000	0
Lateral Dorsal	'Pf'	0	0	0	0	0	0	0	0	0.143	0
	'Hb'	0	0.250	0	0	0	0	0	0	0.500	0
Mediodorsal Nucleus	'LD'	0	1.000	0.143	0	1.000	0	0	0	0	0.143
	'MDmc'	0.400	0.700	0	0	0	0	0	0	0	0
Ventral Anterior Nucleus	'MDpc'	0.071	0.738	0.024	0	0.357	0.119	0	0	0.286	0
	'MGN'	0	0	0	0	0	0	0	0	0	0
	'VAmc'	0	0	0	0	0.500	0	0	0	0	0.500
Pulvinar Nucleus	'VApc'	0	0.211	0	0	0.684	0	0	0	0	0.474
	'PuA'	0	0	0.250	0	0	1.000	0	0	0.250	0
Ventral Lateral Nucleus	'PuL'	0	0.063	0.188	0	0	0	0	0.063	0.188	0
	'PuM'	0	0.569	0.554	0	0.185	0.185	0.031	0.369	0.554	0.000
	'MV'	0	0	0	0	0	0	0	0	0	0
Ventral posterior Nucleus	'VLa'	0	0	0	0	0.308	0	0	0	0.077	0.615
	'VLpd'	0	0.429	0	0	0.571	0	0	0	0.071	0.714
	'VLpv'	0	0.185	0	0	0.333	0.037	0	0	0.370	0.148
Lateral Geniculate Nucleus	'VM'	0	0	0	0	0.500	0	0	0	0	0.500
	'VPI'	0	0	0	0	0	0.333	0	0	0.333	0
	'VPLa'	0	0	0	0	0	0	0	0	0	0
	'VPLp'	0	0.048	0.333	0	0.048	0.619	0	0	0.429	0
'thalamus _body'	'VPM'	0	0	0	0	0	0.667	0	0	0.111	0
	'LGNmc'	0	0	0	0	0	0	0	0	0	0
	'LGNpc'	0	0	0	0	0	0	0	0	0	0
	'Po'	0	0	0.500	0	0	0	0	1.000	1.000	0
	'LP'	0	0.522	0.913	0	0.304	0.348	0	0.043	0.391	0
	'Li'	0	0	0.250	0	0.000	0.250	0	0	0.750	0
	'Pv'	0	0	0	0	0	0	0	0	0	0
	'RN'	0	0	0	0	0	0	0	0	0	0
	'SG'	0	0	0	0	0	0	0	1.000	1.000	0
	'STh'	0	0	0	0	0	0	0	0	0	0
'mtt'	0	0.333	0	0	0.333	0	0	0	0	0	
'sPf'	0	0	0	0	0	0	0	0	0	0	
'thalamus _body'	0	0.143	0.071	0	0.143	0	0	0	0	0	

Table S6: the detailed identification of thalamic nuclei of each network related thalamic subdivisions on the right. Each value demonstrates the percentage of overlaps between detected thalamic sub-divisions and the thalamic atlas (the overlap divided by the size of the thalamic nuclei atlas). In the result, we only reported those nuclei which have more 10% overlaps. Notably, there are overlaps between certain atlas nuclei. Considering the voxel size of our result, we thought it is better to keep the original comparison without considering the overlaps between the atlas overlaps.

Abbreviations of thalamic nuclei: (from Morel 1997, Multiarchitectonic and stereotactic atlas of the human thalamus)

AD anterodorsal nucleus
AM anteromedial nucleus
AV anteroventral nucleus
Cd caudate nucleus
CeM central medial nucleus
CG central gray
CL central lateral nucleus
CM centre me´dian nucleus
Hb habenular nucleus
IC internal capsule
LD lateral dorsal nucleus
LGN lateral geniculate nucleus
Li limitans nucleus
LP lateral posterior nucleus
MB mammillary body
MD mediodorsal nucleus
MDmc mediodorsal nucleus, magnocellular division
MDpc mediodorsal nucleus, parvocellular division, MDpl mediodorsal nucleus, paralamellar division
MGN medial geniculate nucleus
MGm medial geniculate nucleus, medial division
MGv medial geniculate nucleus, ventral division
MTT mammillothalamic tract
MV medioventral nucleus
Pf parafascicular nucleus
Po posterior nucleus
PuA anterior pulvinar, PuI inferior pulvinar, PuL lateral pulvinar, PuM medial pulvinar
Pv paraventricular nuclei
R reticular thalamic nucleus
RN red nucleus
Sg supragenulate nucleus
SN substantia nigra
sPf subparafascicular nucleus
STh subthalamic nucleus
VA ventral anterior nucleus
VAmc ventral anterior nucleus, magnocellular division
VLa ventral lateral anterior nucleus, VLp ventral lateral posterior nucleus
VLpl ventral lateral posterior nucleus, paralamellar division
VLpd ventral lateral posterior nucleus, dorsal division
VLpv ventral lateral posterior nucleus, ventral division
VM ventral medial nucleus
VPI ventral posterior inferior nucleus
VPL ventral posterior lateral nucleus
VPLa ventral posterior lateral nucleus, anterior division
VPLp ventral posterior lateral nucleus, posterior division
VPM ventral posterior medial nucleus
VPMpc ventral posterior medial nucleus, parvocellular division