

Supplemental Material for the manuscript:

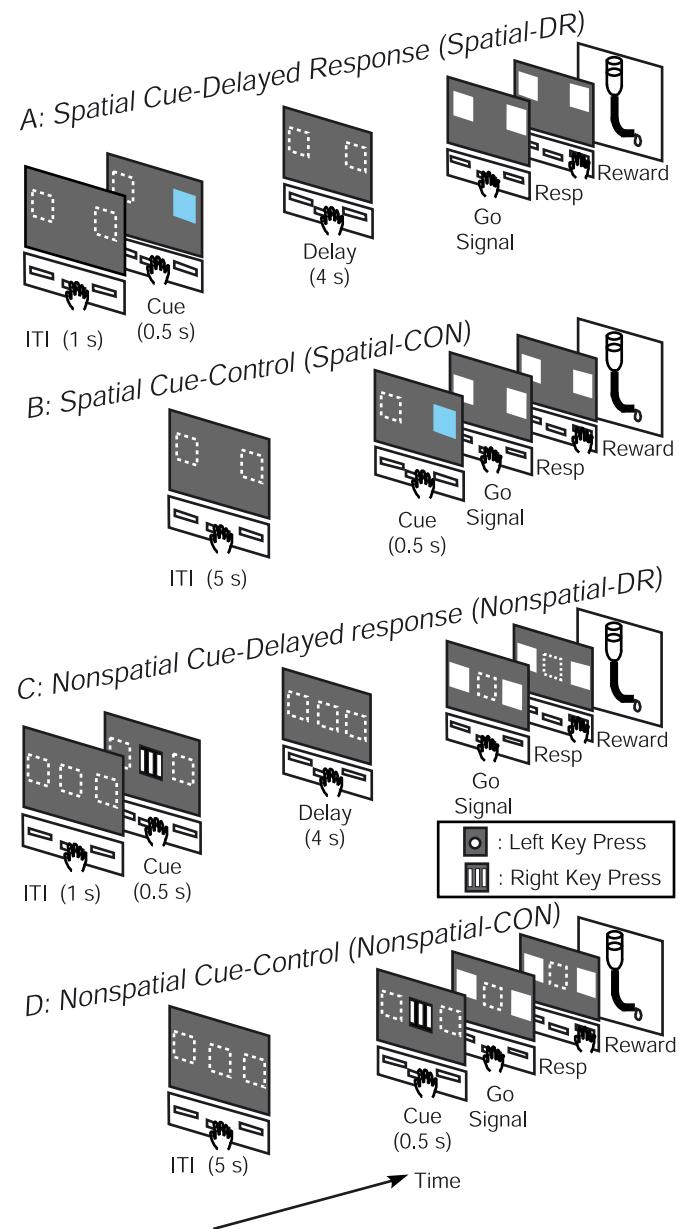
“Default mode of brain activity demonstrated by PET imaging in awake monkeys –
higher rest-related than working memory-related activity in medial cortical areas”

by T. Kojima, H. Onoe, K. Hikosaka, K-I. Tsutui, H. Tsukada, and M. Watanabe

This material consists of 4 figures and 3 tables.

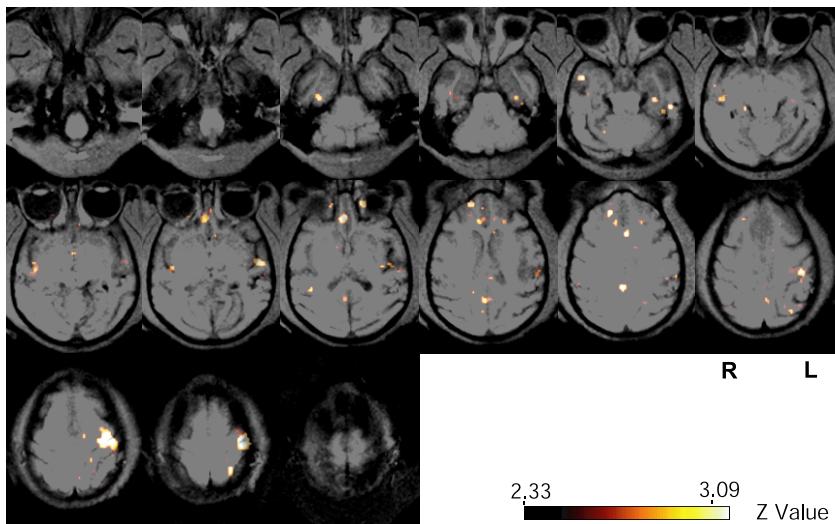
Supplemental Figure 1. The sequence of events in the four different types of tasks: (a) spatial cue-delayed response (spatial-DR) task, (b) spatial cue-control (spatial-CON) task, (c) nonspatial cue-delayed response (nonspatial-DR) task and (d) nonspatial cue-control (nonspatial-CON) task.

Abbreviations: ITI, intertrial interval; Resp, response.

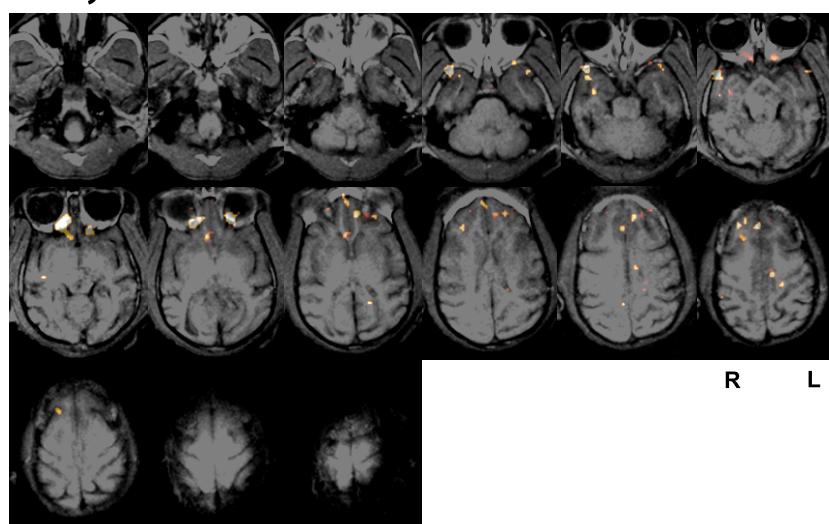


Supplemental Figure 2. Serial transvers sections showing regions with spatial-DR task-induced deactivations for each monkey

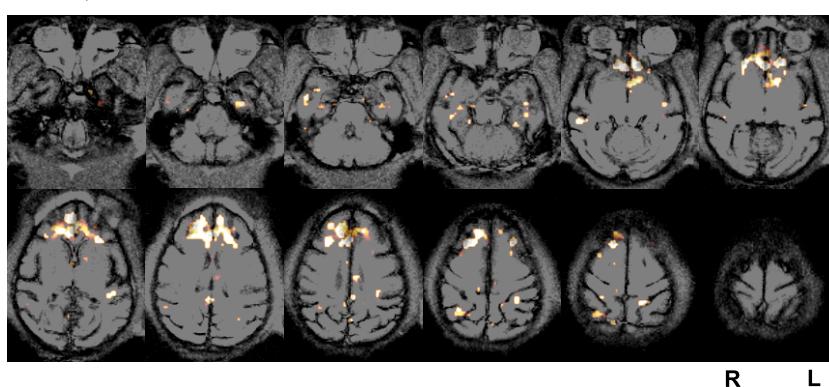
Monkey A



Monkey B

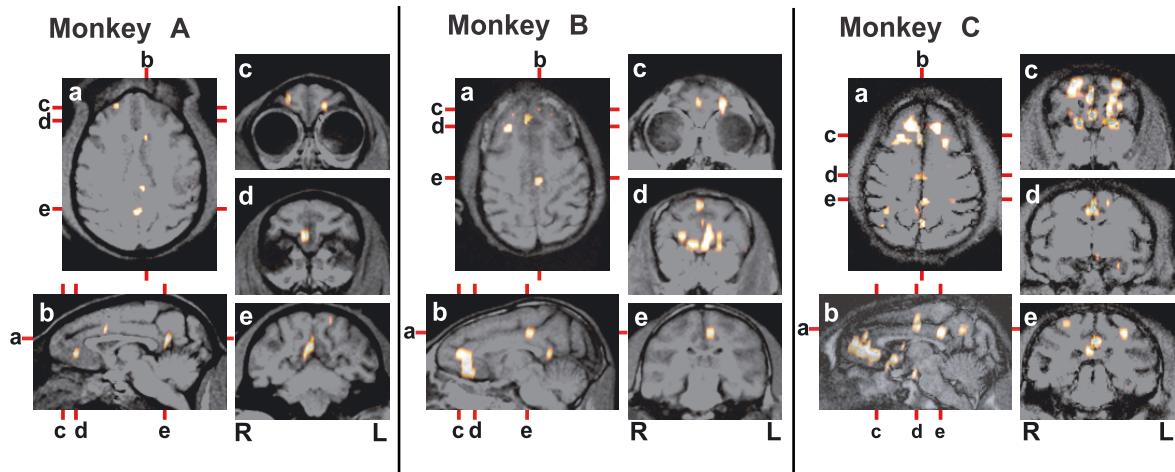


Monkey C

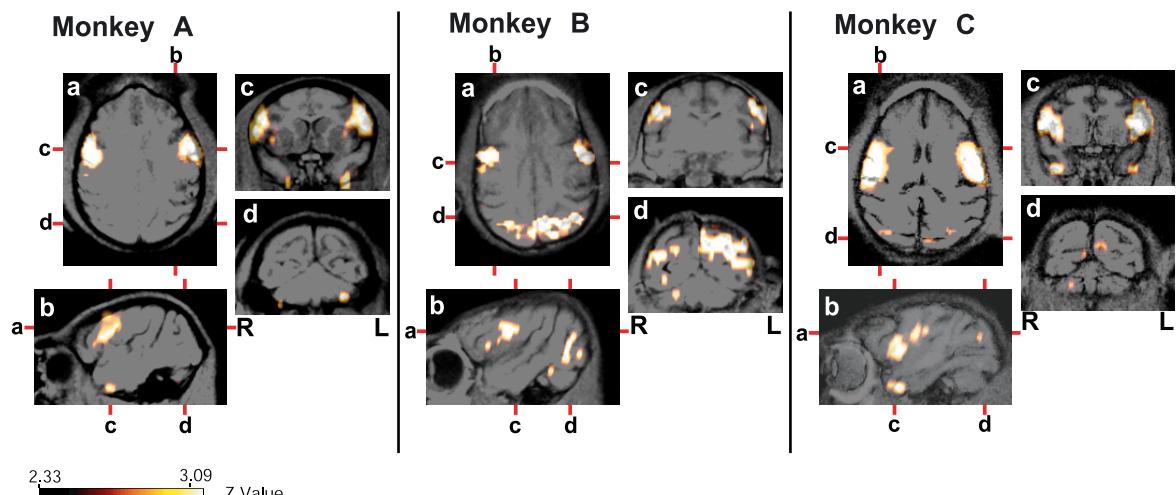


Supplemental Figure 3. Comparisons of PET activities between the REST and spatial-CON task. **A:** Regions with higher activity during REST than during the spatial-CON task. Subtraction images of [REST minus spatial-CON] are illustrated for each monkey. **B:** Regions with higher activity during the spatial-CON task than during REST. Subtraction images of [spatial-CON minus REST] are illustrated for each monkey. For both **A** and **B**, Upper left (a), lower left (b) and right panels (c, d)(and e for A) indicate transverse, sagittal and coronal brain sections of each monkey, respectively. Vertical line b in the upper left panel indicates the L-R line corresponding to the sagittal section pictured in the lower left panel (b). Horizontal line a in panel (b) indicates the top-bottom line corresponding to the transverse section pictured in panel (a). Lines c, d (and e for A) in panels (a) and (b) indicate the A-P line corresponding to the coronal sections pictured in the right panels (c, d)(and e for A).

A: REST minus spatial-CON

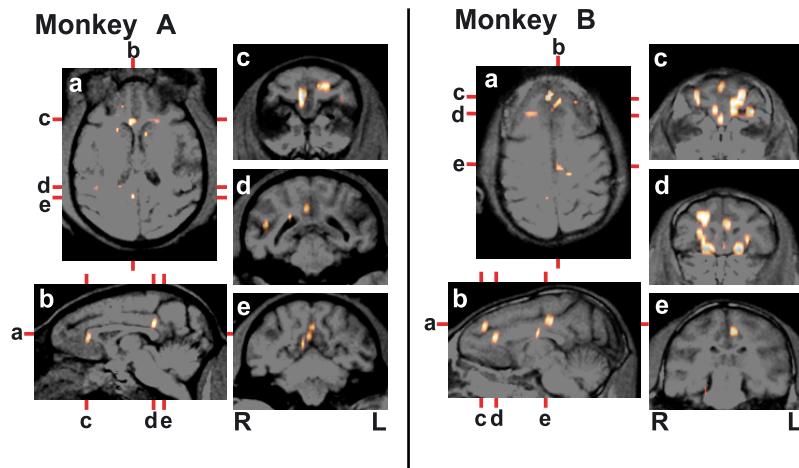


B: Spatial-CON minus REST

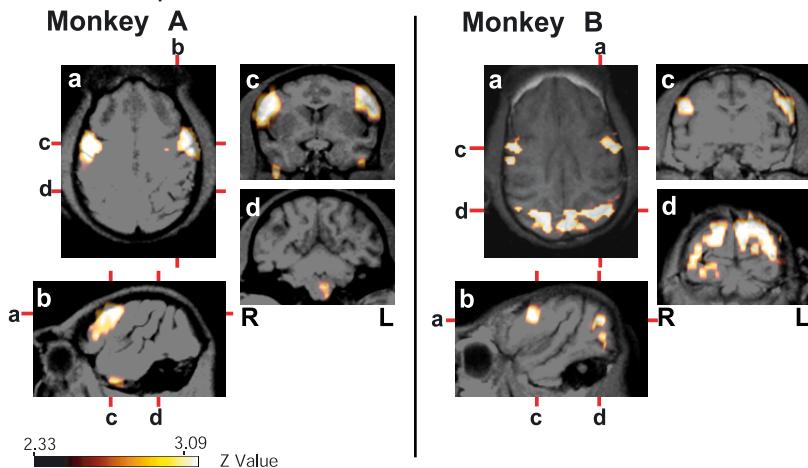


Supplemental Figure 4. Comparisons of PET activities between the REST and nonspatial CON tasks. **A:** Regions with higher activity during the REST than during the nonspatial-CON task. Subtraction images of [REST minus nonspatial-CON] are illustrated for each monkey. **B:** Regions with higher activity during the nonspatial-CON task than during REST. Subtraction images of [nonspatial-CON minus REST] are illustrated for each monkey. Other conventions are the same as in Supplemental Figure 3.

A: REST minus Nonspatial-CON



B: Nonspatial-CON minus REST



Supplemental Table 1

A: Regions with significantly more activity during REST than during the spatial-DR task are listed. Statistical results are based on a single-voxel T threshold set at Z=3.09 (corresponding to p<0.001, uncorrected for multiple comparisons). R and L indicate the right and left hemispheres, respectively. P-value = 0 in the table means p<0.0001. Abbreviations: ACC, anterior cingulate cortex; DIP, depth intraparietal area; DLPFC, dorsolateral prefrontal cortex; DMPFC, dorsomedial prefrontal cortex; MPFC, medial prefrontal cortex; MST, medial superior temporal area; MT, middle temporal area (V5); OFC, orbitofrontal cortex; PCC, posterior cingulate cortex; PE, parietal area PE; PG, parietal area PG; PM (d), dorsal part of the premotor area; PM (v), ventral part of the premotor area; PO, parieto-occipital area; PP, posterior parietal area; preSMA, presupplementary motor area; PS, principal sulcus; LIP, lateral inferior parietal area; MIP, middle inferior parietal area; STG, superior temporal gyrus; STS, superior temporal sulcus; TE, temporal area TE; TEO, temporal area TE occipital part; TFO, temporal area TF occipital part; TLO, temporal area TL, occipital part; TPO; temporal parietooccipital associated area in STS; V1-V4, visual area 1-4; Visual asso, visual association area; VLPFC, ventrolateral prefrontal cortex.

	Monkey A	R-L	Z value	P value	cluster
1	DLPFC (PS, 9)	R	3.49	0	9
2	DLPFC (PS)	L	3.55	0	4
3	OFC (13), MPFC (32)	R	4.44	0	8
4	ACC	R	3.94	0	4
5	ACC	RL	4.09	0	5
6	Motor	L	5.01	0	53
7	Insula	L	4.04	0	8
8	Auditory	L	3.71	0	9
9	Insula	R	4.26	0	16
10	PCC/Precuneus	R	4.21	0	7
11	PCC/Precuneus	R	4.05	0	5
(total number of clusters)					128

	Monkey B	R-L	Z value	P value	cluster
1	OFC (14), MPFC (10)	R	3.44	0.0001	12
2	DLPFC (PS)	L	3.94	0	5
3	ACC	L	3.54	0.0001	5
4	MPFC (10, 32)	L	4.47	0	8
5	DLPFC (8)	R	3.85	0	4
6	OFC (12)	L	5.37	0	25
7	preSMA, ACC	R	4.08	0	10
8	DLPFC (PS)	R	3.2	0.001	4
9	PM(d)	R	4.9	0	7
10	OFC (13), MPFC (25), striatum	R	4.76	0	75
11	OFC (13)	R	4.75	0	13
12	temporal pole	L	3.64	0.0001	4
13	temporal pole	L	3.5	0.0001	7
14	anterior STG	R	4.41	0	45
15	PCC/Precuneus	L	3.67	0.0001	7
(total number of clusters)					231

	Monkey C	R-L	Z value	P value	cluster
1	DLPFC (9), DLPFC (PS), MPFC(10,32)	R RL			
	OFC (12, 13, 14), ACC	RL	5.76	0	419
2	DLPFC (8)	L	4.45	0	9
3	OFC (13)	L	3.51	0.0001	4
4	DLPFC (8)	R	3.52	0.0001	4
5	MPFC (25), striatum	L	5.37	0	28
6	Visual asso (TPO)	R	3.43	0.0001	5
7	ACC	L	3.85	0	6
8	Visual asso (TE, TPO)	R	4.04	0	9
9	Insula	L	3.86	0	8
10	Hippocampus	R	3.73	0	4
11	Hippocampus, Perirhinal	L	3.68	0.0001	13
12	Auditory	L	4.68	0	8
13	Lateral PP (LIP or PE, PO)	L	4.08	0	10
14	PCC/Precuneus	L	3.81	0	9
15	STS fundus	L	3.64	0.0001	4
16	STS fundus	R	4.41	0	14
17	PCC/Precuneus, Retrosplenial	L	4.25	0	13
18	Lateral PP (LIP or PO)	R	4.02	0	16
19	Hippocampus	L	3.91		4
20	Lateral PP (MIP or PE)	R	3.59	0.0001	4
(total number of clusters)					591

B: Regions with significantly more activity during the spatial-DR task than during REST are listed.

Abbreviations and conventions are the same as in **A**.

	Monkey A	R-L	Z value	P value	cluster
1	PM(v), Sensory-Motor	L	7.51	0	296
2	PM(v), Sensory-Motor	R	>9	0	410
3	Visual asso (TE)	R	3.54	0	4
4	Visual asso (TE)	L	4.7	0	47
5	Visual asso (TE)	R	5.95	0	21
6	Striatum	R	3.51	0	4
7	Cerebellum		4.16	0	27
8	Cerebellum		5.78	0	21
9	Cerebellum		4.75	0	33
10	Cerebellum		4.11	0	14
(total number of clusters)				877	
	Monkey B	R-L	Z value	P value	cluster
1	PM(v)	L	3.75	0	12
2	Sensory-Motor	L	5.54	0	89
3	Sensory-Motor	R	4.67	0	63
4	Visual cortex	L	4.44	0	25
5	Visual cortex	R	4.72	0	50
6	Visual cortex	RL	5.21	0	596
7	Visual cortex	R	3.66	0.0001	11
8	Visual cortex	R	3.77	0	4
(total number of clusters)				850	
	Monkey C	R-L	Z value	P value	cluster
1	Temporal pole	L	4.05	0	5
2	Temporal pole	L	4.4	0	16
3	Temporal pole	R	6.24	0	50
4	PM (v), Sensory-Motor	L	>9	0	565
5	PM (v), Sensory-Motor	R	>9	0	566
6	Pulvinar	R	4.35	0	5
7	Cerebellum		3.24	0.001	8
8	Cerebellum		4.45	0	13
9	Visual cortex	R	3.75	0	12
10	Cerebellum		3.73	0	4
11	Visual cortex	L	4	0	6
12	Cerebellum		3.56	0.0001	6
13	Visual cortex	R	3.46	0.0001	5
14	Cerebellum		3.68	0.0001	11
(total number of clusters)				1272	

Supplemental Table 2.

A: Regions with significantly more activity during REST than during the nonspatial-DR task are listed. Abbreviations and conventions are the same as in Supplementary Table 1.

	Monkey A	R-L	Z value	P value	cluster
1	DLPFC(PS)	R	3.83	0	4
2	DLPFC(PS)	R	3.31	0	5
3	ACC	L	4.05	0	9
4	Septum	R	3.51	0	4
5	Motor	L	5.24	0	46
6	anterior STG	R	3.98	0	6
7	Auditory	L	4.66	0	13
8	Auditory	L	3.72	0	4
9	STS	R	3.62	0	4
10	PCC/Precuneus	L	3.55	0	4
11	Hippocampus	L	4.03	0	15
12	Visual cortex	R	3.49	0	4
13	Lateral PP (PE)	L	3.49	0	4
(total number of clusters)					122

	Monkey B	R-L	Z value	P value	cluster
1	MPFC (10, 32)	RL	3.53	0.0001	9
2	DLPFC (9)	R	3.3	0.0001	7
3	DMPFC (9), ACC	RL	3.88	0	15
4	MPFC (10), OFC (14)	RL	3.64	0.0001	22
5	OFC (11,12), MPFC(10), DLPFC (46)	L	5.45	0	81
6	OFC (11,13)	R	5.14	0	39
7	ACC (24)	R	4.02	0	5
8	VLPFC(45), DLPFC (46)	L	3.68	0.0001	4
9	OFC (13, 14)	L	4.47	0	17
10	MPFC (32, 10)	R	4.08	0	8
11	Temporal Pole	L	3.65	0.0001	5
12	anterior STG, STS	R	4.64	0	45
13	anterior STG, STS	L	3.57	0.0001	8
14	Insula	L	3.5	0.0001	7
15	Insula	R	4.3	0	7
16	PCC/Precuneus	L	4	0	7
17	Auditory	L	3.64	0.0001	4
18	Retrosplenial	R	3.55	0.0001	4
(total number of clusters)					294

B: Regions with significantly more activity during the nonspatial-DR task than during REST are listed. Abbreviations and conventions are the same as in A.

	Monkey A	R-L	Z value	P value	cluster
1	PM(v), Sensory-Motor	L	7.25	0	303
2	PM(v), Sensory-Motor	R	7.84	0	386
3	Visual asso (TE)	L	6.08	0	37
4	Visual asso (TE)	R	4.05	0	4
5	Visual asso (TE)	R	4.43	0	14
6	Thalamus	R	4.11	0	14
7	Cerebellum		4.06	0	23
8	Visual cortex	L	3.52	0	5
9	Cerebellum		3.52	0	6
10	Cerebellum		4.42	0	10
11	Visual cortex	R	3.69	0	4
12	Cerebellum		4.5	0	15
13	Cerebellum		4.75	0	23
(total number of clusters)					844

	Monkey B	R-L	Z value	P value	cluster
1	Sensory-Motor	L	4.22	0	17
2	Sensory-Motor	L	3.88	0	33
3	Sensory-Motor	R	5.31	0	42
4	Visual cortex	L	3.47	0.0001	6
5	Visual cortex	L	3.6	0.0001	4
6	Visual cortex	R	3.41	0.0001	4
7	Visual cortex	RL	5.26	0	799
8	Cerebellum		3.57	0.0001	4
9	Visual cortex	R	3.84	0	8
(total number of clusters)					917

Supplemental Table 3

Regions with higher REST-related activity than average activity related to the performance of four different tasks are listed. Conventions and abbreviations are the same as in Supplemental Table 1.

	Monkey A	R-L	Z value	P value	cluster
1	DLPFC (PS), OFC(11)	R	3.98	0	9
2	DLPFC (PS), OFC(11)	L	3.71	0	8
3	DLPFC (PS)	R	3.75	0	9
4	ACC (24), OFC (13), MPFC (10, 32)	R	4.71	0	26
5	DLPFC (PS)	L	3.58	0	5
6	Motor	L	6.18	0	93
7	Anterior STG	R	4.27	0	6
8	Auditory	L	4.4	0	16
9	Auditory	L	3.42	0	6
10	Auditory	R	4.04	0	16
11	Hippocampus	L	3.73	0	9
12	Enthorhinal	R	4.29	0	7
13	PCC/Precuneus	R	3.58	0	10
14	PCC/Precuneus	L	3.8	0	8
15	Vissual Asso (TF)	L	3.77	0	4
16	Enthorhinal	L	3.84	0	4
17	Lateral PP (PF)	R	4.41	0	17
(total number of clusters)					253

	Monkey B	R-L	Z value	P value	cluster
1	ACC (24), MPFC (10, 32)	R	4.66	0	26
2	DLPFC (8), OFC (13, 14)	R	4.13	0	27
3	ACC (24), OFC (11, 12, 13), MPFC (32), RL DLPFC (PS)		6.65	0	389
4	DLPFC (PS)	R	3.52	0	5
5	Temporal Pole	L	4.51	0	47
6	Temporal Pole	R	5.3	0	72
7	Striatum	R	3.86	0	7
8	Anterior STG	L	3.41	0	5
9	Insula	L	4.3	0	17
10	PCC/Precuneus	R	3.84	0	12
11	PCC/Precuneus	R	4.07	0	7
12	Lateral PP (PG)	R	3.32	0	4
13	PCC/Precuneus	R	3.62	0	9
(total number of clusters)					627

	Monkey C	R-L	Z value	P value	cluster
1	LPFC (8, PS), MPFC (32), ACC (24), OFC (11, 12, 13, 14), Striatum	LR	6.54	0	729
2	PM (d)	R	3.99	0	4
3	PM (d)	L	4.25	0	18
4	ACC	L	4.14	0	29
5	Anterior STS (TE, TPO)	R	3.88	0	14
6	Motor, PCC/Precuneus	R	4.25	0	24
7	STS (fundus)	L	3.9	0	13
8	Lateral PP (PE)	R	4.39	0	7
9	STS (fundus)	L	4.06	0	7
10	Lateral PP (PE, PO, DIP)	L	5.51	0	36
11	Enthorhinal	L	4.29	0	15
12	Auditory	R	5.53	0	10
13	Auditory	R	3.14	0.001	4
14	STS (fundus)	R	4.6	0	33
15	Lateral PP (PO, DIP)	R	3.28	0.001	4
16	Lateral PP (PE)	L	3.26	0.001	4
17	PCC/Precuneus	R	5.38	0	49
18	Thalamus	R	3.55	0	5
19	Lateral PP (PE, PO)	R	4.4	0	34
20	Lateral PP (PG)	L	3.26	0.001	4
21	Lateral PP (PE)	R	3.6	0	10
22	Visual Asso	R	4.29	0	8
(total number of clusters)					1061