

## Supplementary Material

### Regional Distributions of Brain Glutamate and Glutamine in Normal Subjects

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*Supplementary Table 1: Mean Regional Metabolite Concentrations for Lobar White Matter Regions*

WM Lobar Regions	Number of Voxels Summed	Cho/Cr	Glu/Cr	Gln/Cr	Glx/Cr	NAA/Cr	Linewidth	CRLB Glu (%)	CRLB Gln (%)	CRLB Glx (%)
Cerebellum	110.6 ± 64	0.28 ± 0.04	0.77 ± 0.12	0.34 ± 0.09	0.88 ± 0.08	0.88 ± 0.13	7.83 ± 0.79	5.7 ± 1.6	17 ± 9	3.1 ± 1
L Frontal Lobe	271.9 ± 85	0.3 ± 0.03	1.01 ± 0.15	0.43 ± 0.08	1.1 ± 0.13	1.33 ± 0.09	6.93 ± 0.45	6.0 ± 5.6	17.3 ± 16	3.7 ± 3
L Occipital Lobe	56.7 ± 47	0.23 ± 0.03	0.98 ± 0.12	0.49 ± 0.11	1.07 ± 0.1	1.34 ± 0.11	6.9 ± 0.74	6.9 ± 7.1	16.2 ± 14	4.0 ± 3
L Parietal Lobe	165.7 ± 70	0.29 ± 0.03	1.01 ± 0.13	0.45 ± 0.09	1.1 ± 0.11	1.39 ± 0.1	6.37 ± 0.86	5.6 ± 2.5	15.5 ± 11	3.4 ± 1
L Temporal Lobe	94.2 ± 29	0.31 ± 0.04	0.99 ± 0.14	0.45 ± 0.11	1.07 ± 0.14	1.36 ± 0.13	6.64 ± 0.68	6.6 ± 5.8	18.7 ± 18	4.2 ± 3
R Frontal Lobe	287.9 ± 81	0.3 ± 0.03	1.01 ± 0.12	0.44 ± 0.1	1.07 ± 0.13	1.33 ± 0.1	6.97 ± 0.58	4.9 ± 2.2	13.9 ± 8	3.2 ± 1
R Occipital Lobe	61.3 ± 38	0.23 ± 0.04	0.99 ± 0.15	0.46 ± 0.17	1.08 ± 0.12	1.34 ± 0.13	6.9 ± 0.78	6.4 ± 3.8	20.6 ± 24	3.9 ± 2
R Parietal Lobe	163.9 ± 58	0.29 ± 0.04	0.95 ± 0.16	0.47 ± 0.1	1.06 ± 0.12	1.39 ± 0.1	6.48 ± 0.99	6.8 ± 4.5	17.2 ± 14	4.1 ± 2
R Temporal Lobe	70.8 ± 22	0.31 ± 0.04	0.96 ± 0.17	0.45 ± 0.12	1.06 ± 0.14	1.32 ± 0.13	6.88 ± 0.85	6.8 ± 3.7	19 ± 17	3.9 ± 1

*Supplementary Table 2: Mean Regional Metabolite Concentrations for Lobar Gray Matter Regions*

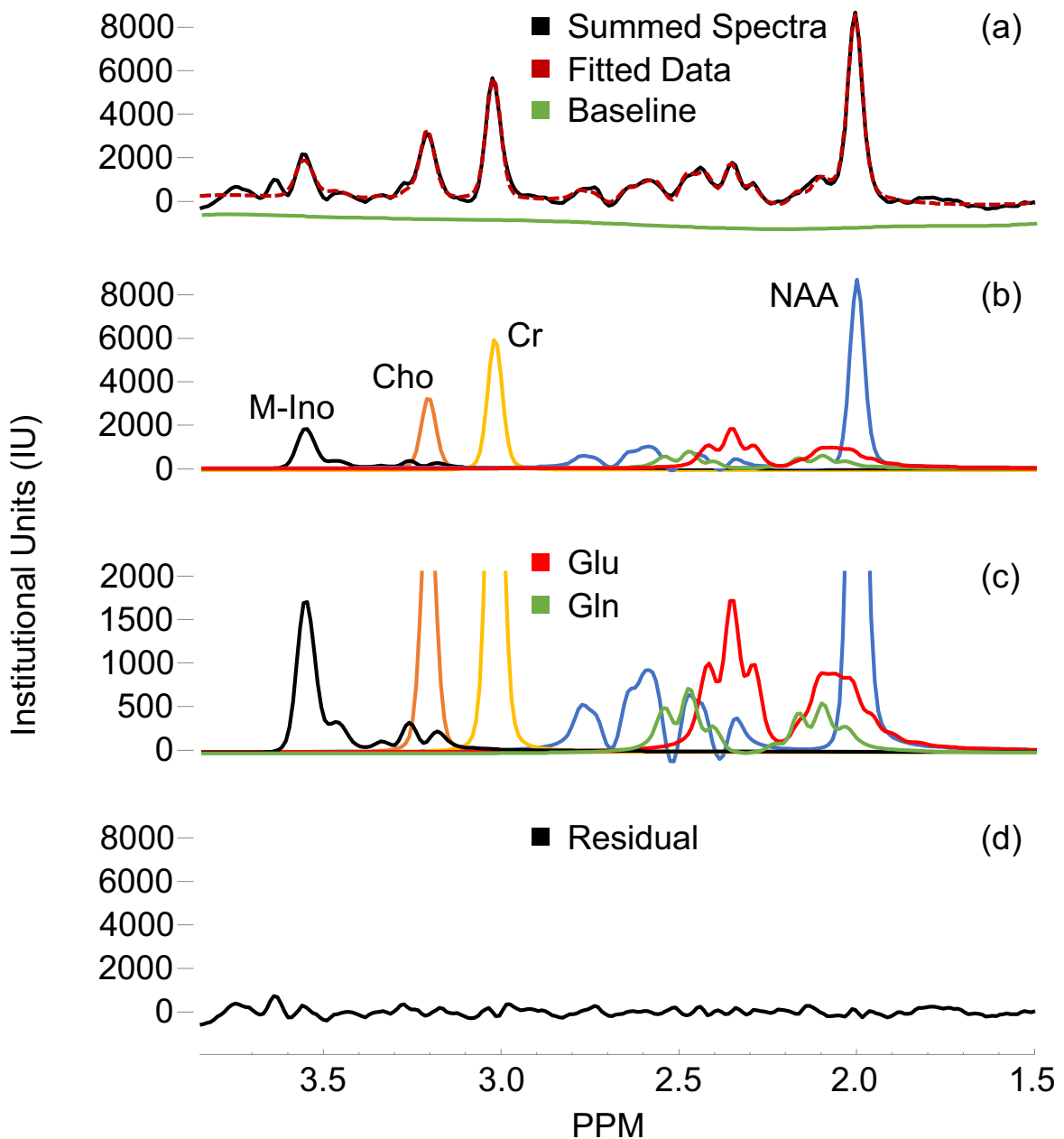
GM Lobar Regions	Number of Voxels Summed	Cho/Cr	Glu/Cr	Gln/Cr	Glx/Cr	NAA/Cr	Linewidth	CRLB Glu (%)	CRLB Gln (%)	CRLB Glx (%)
Cerebellum	62.7 ± 48	0.23 ± 0.03	0.72 ± 0.19	0.36 ± 0.14	0.92 ± 0.14	0.78 ± 0.15	8.03 ± 0.72	10.5 ± 12	25.9 ± 23	3.8 ± 3
L Frontal Lobe	44.0 ± 29	0.23 ± 0.04	1.12 ± 0.22	0.39 ± 0.16	1.26 ± 0.12	1.18 ± 0.13	7.01 ± 1.28	9.4 ± 18	28.6 ± 27	4.9 ± 7
L Occipital Lobe	21.5 ± 56	0.18 ± 0.02	1.16 ± 0.21	0.4 ± 0.2	1.3 ± 0.21	1.17 ± 0.19	7.46 ± 1	7.8 ± 3	36.1 ± 27	4.2 ± 2
L Parietal Lobe	44.7 ± 86	0.18 ± 0.02	1.14 ± 0.15	0.4 ± 0.15	1.26 ± 0.16	1.17 ± 0.12	6.35 ± 0.87	7.4 ± 5	28.9 ± 26	4.5 ± 3
L Temporal Lobe	29.9 ± 30	0.2 ± 0.02	1.11 ± 0.15	0.42 ± 0.17	1.23 ± 0.18	1.14 ± 0.13	7.66 ± 0.76	6.4 ± 2	24.9 ± 19	3.3 ± 1
R Frontal Lobe	42.5 ± 34	0.24 ± 0.03	1.19 ± 0.16	0.38 ± 0.12	1.25 ± 0.17	1.15 ± 0.1	6.92 ± 0.89	6.3 ± 5	25.6 ± 22	3.7 ± 3
R Occipital Lobe	14.7 ± 43	0.17 ± 0.03	1.25 ± 0.37	0.33 ± 0.28	1.41 ± 0.37	1.18 ± 0.22	7.52 ± 1.81	13.4 ± 11	39.1 ± 39	6.0 ± 3
R Parietal Lobe	39.3 ± 67	0.18 ± 0.02	1.14 ± 0.22	0.4 ± 0.1	1.27 ± 0.18	1.19 ± 0.12	6.4 ± 0.87	7.4 ± 7	25 ± 21	3.8 ± 2
R Temporal Lobe	20.2 ± 16	0.22 ± 0.03	1.05 ± 0.22	0.41 ± 0.17	1.2 ± 0.25	1.12 ± 0.14	7.93 ± 0.89	8.4 ± 4	33 ± 26	4.0 ± 2

Supplementary Table 3: Mean Regional Metabolite Concentrations for the AAL Atlas Regions

AAL Atlas Region	Number of Voxels Summed	Cho/Cr	Glu/Cr	Gln/Cr	Glx/Cr	NAA/Cr	Linewidth	CRLB Glu (%)	CRLB Gln (%)	CRLB Glx (%)
Calcarine L	66.0 ± 19	0.19 ± 0.03	1.01 ± 0.14	0.43 ± 0.11	1.1 ± 0.13	1.29 ± 0.09	6.55 ± 0.86	5.9 ± 3	16.8 ± 10	3.8 ± 2
Calcarine R	64.4 ± 21	0.17 ± 0.03	1.03 ± 0.13	0.4 ± 0.13	1.1 ± 0.11	1.27 ± 0.13	6.61 ± 0.87	6.4 ± 4	23.2 ± 26	4.2 ± 2
Caudate L	12.1 ± 7	0.31 ± 0.05	0.92 ± 0.2	0.46 ± 0.17	1.11 ± 0.17	1.24 ± 0.13	7.09 ± 0.9	14 ± 18	28.6 ± 18	6.9 ± 8
Caudate R	13.1 ± 7	0.31 ± 0.04	0.89 ± 0.22	0.47 ± 0.15	1.06 ± 0.17	1.25 ± 0.16	7.08 ± 0.84	13.9 ± 19	26.5 ± 24	5.3 ± 3
Cerebellum	395.5 ± 221	0.21 ± 0.02	0.78 ± 0.1	0.35 ± 0.07	0.91 ± 0.09	0.83 ± 0.1	7.1 ± 0.71	5.4 ± 2	14.7 ± 7	2.9 ± 1
Anterior Cingulum L	20.3 ± 17	0.31 ± 0.07	1.04 ± 0.36	0.35 ± 0.21	1.19 ± 0.33	1.15 ± 0.2	7.28 ± 1.01	12.8 ± 11	32.9 ± 34	8 ± 7
Anterior Cingulum R	18.6 ± 15	0.3 ± 0.05	1.07 ± 0.24	0.37 ± 0.18	1.2 ± 0.27	1.15 ± 0.15	6.82 ± 0.95	10.8 ± 6	32.9 ± 30	6.5 ± 4
Middle Cingulum L	78.1 ± 19	0.23 ± 0.03	1.13 ± 0.13	0.39 ± 0.12	1.2 ± 0.14	1.21 ± 0.1	6.29 ± 0.64	6.9 ± 8	22.7 ± 22	4.7 ± 5
Middle Cingulum R	68.1 ± 16	0.23 ± 0.03	1.16 ± 0.13	0.41 ± 0.07	1.2 ± 0.11	1.23 ± 0.1	6.31 ± 0.82	6.1 ± 5	21.2 ± 20	4.5 ± 5
Posterior Cingulum L	15.4 ± 4	0.22 ± 0.03	1.15 ± 0.17	0.38 ± 0.16	1.27 ± 0.17	1.32 ± 0.13	6.13 ± 0.86	6.9 ± 2	29.4 ± 23	4.3 ± 2
Posterior Cingulum R	20.5 ± 5	0.21 ± 0.03	1.11 ± 0.2	0.47 ± 0.16	1.22 ± 0.2	1.28 ± 0.1	6.15 ± 0.97	6.9 ± 4	22.5 ± 20	4.3 ± 2
Cuneus L	33.4 ± 13	0.17 ± 0.03	1.05 ± 0.14	0.41 ± 0.13	1.13 ± 0.13	1.26 ± 0.12	6.86 ± 1.08	7.4 ± 4	23.4 ± 14	4.7 ± 3
Cuneus R	31.7 ± 13	0.16 ± 0.03	1.06 ± 0.2	0.39 ± 0.18	1.16 ± 0.18	1.25 ± 0.14	6.88 ± 1.24	9.2 ± 14	30.8 ± 31	4.6 ± 4
Frontal L	191.2 ± 115	0.23 ± 0.02	1.14 ± 0.14	0.44 ± 0.1	1.2 ± 0.14	1.26 ± 0.13	7.03 ± 0.73	5.7 ± 2	18.7 ± 11	3.9 ± 2
Frontal R	211.5 ± 115	0.23 ± 0.02	1.15 ± 0.12	0.43 ± 0.09	1.2 ± 0.16	1.23 ± 0.12	7.12 ± 0.8	5.2 ± 2	17.7 ± 12	3.6 ± 2
Fusiform L	53.9 ± 22	0.22 ± 0.04	0.97 ± 0.1	0.42 ± 0.12	1.06 ± 0.1	1.15 ± 0.14	7.07 ± 0.71	5.8 ± 2	18.3 ± 14	3.4 ± 1
Fusiform R	46.9 ± 21	0.23 ± 0.03	0.99 ± 0.15	0.38 ± 0.1	1.06 ± 0.15	1.13 ± 0.16	7.2 ± 0.73	6 ± 3	20.4 ± 18	3.6 ± 1
Hippocampus L	18.8 ± 10	0.32 ± 0.04	0.95 ± 0.2	0.39 ± 0.15	1.05 ± 0.21	1.1 ± 0.16	7.23 ± 0.72	8.9 ± 5	27.3 ± 18	5.3 ± 4
Hippocampus R	16.2 ± 8	0.32 ± 0.04	0.91 ± 0.14	0.4 ± 0.15	0.99 ± 0.15	1.13 ± 0.15	7.35 ± 1.05	8 ± 3	24.1 ± 18	4.7 ± 2
Insula L	53.9 ± 18	0.27 ± 0.03	1.16 ± 0.13	0.43 ± 0.11	1.2 ± 0.13	1.23 ± 0.12	6.7 ± 0.92	5.1 ± 2	16 ± 5	3.4 ± 2
Insula R	60.3 ± 25	0.27 ± 0.03	1.06 ± 0.13	0.39 ± 0.1	1.12 ± 0.15	1.25 ± 0.13	6.96 ± 1.18	6.1 ± 4	20.9 ± 16	3.7 ± 2
Lingual L	80.3 ± 23	0.18 ± 0.03	1.01 ± 0.1	0.43 ± 0.1	1.12 ± 0.1	1.22 ± 0.11	6.58 ± 0.72	5.2 ± 2	17.1 ± 18	3.3 ± 1
Lingual R	74 ± 23	0.18 ± 0.02	1 ± 0.12	0.41 ± 0.09	1.07 ± 0.12	1.18 ± 0.14	6.64 ± 0.72	5.8 ± 3	16.4 ± 9	3.8 ± 2
Occipital L	76 ± 41	0.19 ± 0.02	1.1 ± 0.12	0.39 ± 0.13	1.15 ± 0.13	1.25 ± 0.13	7.1 ± 0.81	5.9 ± 5	21.4 ± 19	3.9 ± 3
Occipital R	84.2 ± 38	0.19 ± 0.02	1.08 ± 0.11	0.37 ± 0.12	1.14 ± 0.12	1.28 ± 0.13	7.26 ± 0.8	6.8 ± 7	25.2 ± 25	3.8 ± 3
Pallidum L	4.1 ± 4	0.25 ± 0.05	0.89 ± 0.13	0.32 ± 0.24	1.01 ± 0.12	1.14 ± 0.11	7.71 ± 0.88	13.6 ± 12	37.5 ± 34	6 ± 3
Pallidum R	4.3 ± 4	0.26 ± 0.05	0.81 ± 0.23	0.38 ± 0.2	1.01 ± 0.16	1.21 ± 0.15	7.69 ± 0.9	14.9 ± 20	36.2 ± 22	5.6 ± 2
Paracentral Lobule L	7.2 ± 4	0.19 ± 0.05	1.47 ± 0.51	0.44 ± 0.29	1.72 ± 1.42	1.43 ± 0.34	6.81 ± 1.34	13.6 ± 15	39.1 ± 34	8.5 ± 10
Paracentral Lobule R	11.5 ± 8	0.17 ± 0.04	1.47 ± 0.71	0.65 ± 0.43	1.81 ± 0.69	1.53 ± 0.25	7.32 ± 1.34	11.6 ± 8	36.7 ± 27	5.1 ± 2
Parietal L	104.8 ± 57	0.2 ± 0.02	1.12 ± 0.16	0.38 ± 0.12	1.19 ± 0.16	1.24 ± 0.13	6.72 ± 0.86	6.2 ± 4	25.7 ± 23	4 ± 3
Parietal R	113 ± 61	0.2 ± 0.02	1.08 ± 0.18	0.36 ± 0.13	1.15 ± 0.17	1.25 ± 0.13	6.92 ± 0.92	6.4 ± 4	28.7 ± 29	4.2 ± 3
Postcentral L	50 ± 26	0.2 ± 0.02	1.15 ± 0.23	0.48 ± 0.12	1.19 ± 0.2	1.3 ± 0.16	7.03 ± 0.81	7.3 ± 7	20.6 ± 16	4.3 ± 4
Postcentral R	53.8 ± 32	0.2 ± 0.02	1.11 ± 0.18	0.47 ± 0.18	1.17 ± 0.2	1.29 ± 0.15	7.09 ± 1.01	6.6 ± 4	22 ± 21	4.3 ± 3
Precentral L	38.8 ± 25	0.2 ± 0.02	1.13 ± 0.24	0.43 ± 0.14	1.27 ± 0.23	1.35 ± 0.18	7.1 ± 0.88	7.7 ± 6	25.5 ± 21	4.5 ± 3
Precentral R	46 ± 31	0.21 ± 0.02	1.16 ± 0.23	0.43 ± 0.2	1.25 ± 0.35	1.39 ± 0.38	7.16 ± 1.06	8.5 ± 11	28.2 ± 26	4.6 ± 3
Precuneus L	85.8 ± 22	0.19 ± 0.03	1.08 ± 0.16	0.4 ± 0.14	1.18 ± 0.16	1.26 ± 0.11	6.22 ± 0.91	6.4 ± 4	23.7 ± 24	3.9 ± 2
Precuneus R	79.4 ± 21	0.18 ± 0.03	1.09 ± 0.17	0.39 ± 0.1	1.18 ± 0.19	1.25 ± 0.08	6.37 ± 0.84	6.5 ± 4	22.8 ± 17	4.3 ± 3
Putamen L	28.2 ± 13	0.27 ± 0.03	0.92 ± 0.16	0.39 ± 0.1	1.06 ± 0.11	1.16 ± 0.11	7.12 ± 0.83	8.9 ± 9	24 ± 17	4.2 ± 2
Putamen R	25.9 ± 13	0.28 ± 0.08	1.1 ± 1.03	0.6 ± 1	1.34 ± 1.57	1.11 ± 0.24	7.45 ± 1.27	8.3 ± 5	22.2 ± 14	4.2 ± 2
Rolandic Operculum L	48.4 ± 13	0.23 ± 0.03	1.18 ± 0.14	0.45 ± 0.14	1.22 ± 0.18	1.3 ± 0.13	6.73 ± 1	4.8 ± 2	17.5 ± 18	3.3 ± 2
Rolandic Operculum R	37.6 ± 12	0.24 ± 0.03	1.1 ± 0.14	0.41 ± 0.11	1.14 ± 0.15	1.3 ± 0.12	6.66 ± 1.01	5.2 ± 2	17.1 ± 8	3.5 ± 1
Superior Motor Area L	26.6 ± 21	0.21 ± 0.05	1.31 ± 0.35	0.4 ± 0.24	1.46 ± 0.29	1.36 ± 0.23	6.94 ± 1	10.4 ± 7	37.1 ± 34	6.3 ± 4
Superior Motor Area R	19.9 ± 16	0.23 ± 0.04	1.21 ± 0.24	0.58 ± 0.3	1.34 ± 0.3	1.33 ± 0.22	6.93 ± 1.16	9.5 ± 5	27.7 ± 19	6.1 ± 4
Temporal L	198.4 ± 76	0.22 ± 0.02	1.11 ± 0.1	0.37 ± 0.08	1.18 ± 0.11	1.23 ± 0.12	7.03 ± 0.68	4.6 ± 1	17.5 ± 7	3 ± 1
Temporal R	160 ± 71	0.23 ± 0.02	1.08 ± 0.14	0.38 ± 0.08	1.16 ± 0.14	1.22 ± 0.1	7.21 ± 0.78	5.1 ± 2	18.3 ± 8	3.2 ± 1
Thalamus L	29.3 ± 12	0.29 ± 0.04	0.99 ± 0.14	0.38 ± 0.17	1.09 ± 0.14	1.16 ± 0.12	7.3 ± 0.87	10.2 ± 13	30.6 ± 26	6.3 ± 8
Thalamus R	30.3 ± 12	0.29 ± 0.04	0.97 ± 0.15	0.37 ± 0.15	1.04 ± 0.14	1.19 ± 0.08	7.2 ± 0.97	8.5 ± 4	31 ± 22	5 ± 2

Supplementary Table 4: Mean Regional Improvement in Spectral Fitting of Glx for the AAL Atlas.

AAL Atlas Region	Mean CRLB of Glx for Spectral Fitting of Integrated Spectra (%) (A)	Mean CRLB of Glx for Spectral Fitting of Individual Spectra (%) (B)	Improvement Factor (IF) (B/A)	Glx/Cr from Spectral Fitting of Integrated Spectra Mean $\pm$ Std. Dev. (C)	Glx/Cr from Spectral Fitting of Individual Spectra Mean $\pm$ Std. Dev. (D)	%Difference ((C-D)/C) *100
Calcarine L	3.8	13.9	3.66	1.1 $\pm$ 0.13	0.87 $\pm$ 0.1	21.03
Calcarine R	4.2	15.4	3.67	1.1 $\pm$ 0.11	0.82 $\pm$ 0.12	25.69
Caudate L	6.9	22.5	3.26	1.11 $\pm$ 0.17	0.96 $\pm$ 0.57	13.27
Caudate R	5.3	21.1	3.98	1.06 $\pm$ 0.17	0.92 $\pm$ 0.4	13.24
Cerebellum	2.9	12.3	4.24	0.91 $\pm$ 0.09	0.73 $\pm$ 0.06	20.17
Anterior Cingulum L	8	21.9	2.74	1.19 $\pm$ 0.33	0.92 $\pm$ 0.17	22.31
Anterior Cingulum R	6.5	19	2.92	1.2 $\pm$ 0.27	0.97 $\pm$ 0.16	19.52
Middle Cingulum L	4.7	18	3.83	1.2 $\pm$ 0.14	0.92 $\pm$ 0.13	22.82
Middle Cingulum R	4.5	16.9	3.76	1.2 $\pm$ 0.11	0.95 $\pm$ 0.1	20.80
Posterior Cingulum L	4.3	15.3	3.56	1.27 $\pm$ 0.17	0.89 $\pm$ 0.17	29.89
Posterior Cingulum R	4.3	14.1	3.28	1.22 $\pm$ 0.2	0.92 $\pm$ 0.15	24.99
Cuneus L	4.7	17.7	3.77	1.13 $\pm$ 0.13	0.8 $\pm$ 0.15	29.26
Cuneus R	4.6	16.5	3.59	1.16 $\pm$ 0.18	0.84 $\pm$ 0.18	27.93
Frontal L	3.9	24.4	6.26	1.2 $\pm$ 0.14	0.99 $\pm$ 0.31	18.06
Frontal R	3.6	20.4	5.67	1.2 $\pm$ 0.16	0.97 $\pm$ 0.25	18.55
Fusiform L	3.4	13.7	4.03	1.06 $\pm$ 0.1	0.81 $\pm$ 0.16	23.96
Fusiform R	3.6	12.9	3.58	1.06 $\pm$ 0.15	0.78 $\pm$ 0.17	26.78
Hippocampus L	5.3	16	3.02	1.05 $\pm$ 0.21	0.86 $\pm$ 0.18	18.38
Hippocampus R	4.7	16.6	3.53	0.99 $\pm$ 0.15	0.77 $\pm$ 0.25	22.28
Insula L	3.4	14	4.12	1.2 $\pm$ 0.13	0.91 $\pm$ 0.14	24.31
Insula R	3.7	14.6	3.95	1.12 $\pm$ 0.15	0.95 $\pm$ 0.49	15.44
Lingual L	3.3	14.7	4.45	1.12 $\pm$ 0.1	0.86 $\pm$ 0.16	23.48
Lingual R	3.8	13.6	3.58	1.07 $\pm$ 0.12	0.8 $\pm$ 0.14	25.45
Occipital L	3.9	16.3	4.18	1.15 $\pm$ 0.13	0.89 $\pm$ 0.11	22.98
Occipital R	3.8	14.4	3.79	1.14 $\pm$ 0.12	0.87 $\pm$ 0.11	24.29
Pallidum L	6	13.1	2.18	1.01 $\pm$ 0.12	0.83 $\pm$ 0.29	18.57
Pallidum R	5.6	14.8	2.64	1.01 $\pm$ 0.16	0.67 $\pm$ 0.15	34.25
Paracentral Lobule L	8.5	21.1	2.48	1.72 $\pm$ 1.42	1.17 $\pm$ 0.35	31.88
Paracentral Lobule R	5.1	19.3	3.78	1.81 $\pm$ 0.69	1.2 $\pm$ 0.55	33.64
Parietal L	4	15.6	3.9	1.19 $\pm$ 0.16	0.94 $\pm$ 0.09	21.04
Parietal R	4.2	15.9	3.79	1.15 $\pm$ 0.17	0.91 $\pm$ 0.13	20.98
Postcentral L	4.3	18.5	4.3	1.19 $\pm$ 0.2	0.89 $\pm$ 0.15	25.05
Postcentral R	4.3	15.4	3.58	1.17 $\pm$ 0.2	0.88 $\pm$ 0.16	24.96
Precentral L	4.5	19	4.22	1.27 $\pm$ 0.23	0.96 $\pm$ 0.2	24.25
Precentral R	4.6	16.6	3.61	1.25 $\pm$ 0.35	1.11 $\pm$ 0.5	11.16
Precuneus L	3.9	15.3	3.92	1.18 $\pm$ 0.16	0.91 $\pm$ 0.16	22.82
Precuneus R	4.3	16.2	3.77	1.18 $\pm$ 0.19	0.94 $\pm$ 0.13	20.42
Putamen L	4.2	15	3.57	1.06 $\pm$ 0.11	0.79 $\pm$ 0.15	25.43
Putamen R	4.2	13.2	3.14	1.34 $\pm$ 1.57	1.08 $\pm$ 1.22	18.95
Rolandic Operculum L	3.3	11.7	3.55	1.22 $\pm$ 0.18	0.93 $\pm$ 0.12	23.69
Rolandic Operculum R	3.5	12.9	3.69	1.14 $\pm$ 0.15	0.83 $\pm$ 0.12	27.50
Superior Motor Area L	6.3	26.5	4.21	1.46 $\pm$ 0.29	1.02 $\pm$ 0.23	29.77
Superior Motor Area R	6.1	23.1	3.79	1.34 $\pm$ 0.3	1.12 $\pm$ 0.23	16.39
Temporal L	3	10.9	3.63	1.18 $\pm$ 0.11	0.96 $\pm$ 0.09	19.03
Temporal R	3.2	11.3	3.53	1.16 $\pm$ 0.14	0.88 $\pm$ 0.11	24.01
Thalamus L	6.3	18.1	2.87	1.09 $\pm$ 0.14	0.8 $\pm$ 0.21	26.05
Thalamus R	5	17.6	3.52	1.04 $\pm$ 0.14	0.77 $\pm$ 0.14	26.53
Mean $\pm$ Std. Dev.	16.5 $\pm$ 3	4.5 $\pm$ 1.3	3.7 $\pm$ 0.7			23.0 $\pm$ 5.0



Supplementary Figure 1:

Detailed fitting results for ROI averaged spectra of the left calcarine region in Figure 1(c) showing individual basis fits. (a) Original ROI average spectra shown with fitted spectra and baseline of the fit. (b) Individual basis fitting results for NAA, Cr, Cho, myo-inositol, Glu and Gln. (c) Individual basis function fitting results focused to show details of Glu and Gln fitting. (d) Residual of the spectral fitting process.