

# Supplementary Tables

**Table S1. Results of the voxel-based comparisons of apparent MWF among the three participant groups.**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>CN&gt;AD</b>	259548	Rt Limbic Posterior Congulate		5.52, -52.25, 2014	65535
		Lt Parietal Precuneus		-14.17, -66.42, 36.03	7.88
		Lt Parietal Supramarginal Gyrus		-44.59, -53.04, 30.03	7.171
<b>MCI&gt;AD</b>	154712	Lt Sub-lobar Insula GM	13	-36.06, -35.13, 19.71	6.777
		Lt Temporal Sub-Gyrus		-37.34, -56.31, 5.52	6.765
		Lt Limbic Posterior Cingulate		-12.43, -48.71, 13.42	6.652
	4600	Rt Pons		-9.08, -19.09, -30.71	4.983
		Rt Posterior Cerebellar Tonsil GM		25.76, -43.68, -39.51	4.358
				14.75, -27.85, -42.25	4.244
	548	Lt Posterior Cerebellar Tonsil GM		-28.38, -44.79, -40.53	3.998

This table is listed in the result of the voxel-based full factorial ANCOVA test of apparent myelin water fraction (MWF) maps among the three subject groups. Participant's age was used as covariate. We did not find any significant differences of apparent MWF values for the following tests: CN <AD, CN>MCI and CN <MCI, and MCI<AD.

CN, cognitively normal; MCI, mild cognitive impairment; AD, Alzheimer's disease; Rt, right; Lt, left; BA, Brodmann area

**Table S2. Results of the voxel-based comparisons of GMV among the three participant groups**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>CN&gt;MCI</b>					
	789	Rt limbic cingulate gyrus	24	4.04, -17.77, 37.8	6.267
		Rt frontal paracentral lobule	31	5.32, -26.81, 43.72	4.722
	2664	Rt temporal fusiform gyrus	20	43.73, 0.49, -20.61	6.225
		Rt temporal middle temporal gyrus	21	49.22, -5.53, 17.03	5.941
		Rt temporal inferior temporal gyrus	20	53.44, -10.61, -22.85	5.165
	917	Rt limbic uncus	38	23.1, 4.69, -34.07	5.501
	201	Rt frontal superior frontal gyrus	9	11.48, 55.81, 20.57	5.038
	271	Lt temporal superior temporal gyrus	38	-39.5, 6.77, -24.13	5.028
	248	Rt cerebellum anterior lobe culmen		7.17, -67.23, -4.67	5.011
		Rt occipital lingual gyrus	19	12.68, -63.45, -0.17	4.803
	355	Rt limbic parahippocampal gyrus		26.98, -17.99, -18.59	4.933
	105	Rt frontal middle frontal gyrus	6	24.67, -12.46, 54.86	4.600
		Rt frontal precentral gyrus	6	24.72, -17.52, 48.98	4.536
<b>CN&gt;AD</b>					
	180927	Rt sub-lobar claustrum		37.93, -16.43, -6.1	65535
		Rt limbic parahippocampal gyrus	28	24.2, -17.97, -18.64	65535
		Rt temporal middle temporal gyrus	21	50.59, -7.06, -15.81	65535
	726	Rt cerebellum posterior pyramis		31.14, -72.86, -34.53	3.971
		Rt cerebellum posterior uvula		30.99, -76.7, -24.09	3.480
	454	Lt cerebellum posterior inferior semi-lunar lobule		-27.12, -70.9, -38.03	3.864
		Lt cerebellum posterior cerebellar tonsil		-38.09, -52.02, -43.19	3.549
<b>MCI&gt;AD</b>					
	18772	Rt limbic parahippocampal gyrus	28	21.41, -18.09, 17.34	6.264
		Rt sub-lobar claustrum		37.93, -16.43, -6.1	6.093
		Rt sub-lobar lentiform nucleus		31.05, -6.35, -7.96	6.018
	1644	Lt frontal medial frontal gyrus	10	-13.23, 36.07, -7.39	5.461
		Rt limbic anterior cingulate	24	6.14, 31.38, -3.46	5.049
		Lt frontal middle frontal gyrus	11	-21.58, 38.64, -4.59	4.976
	477	Rt limbic parahippocampal gyrus	30	11.29, -37.42, 7.68	5.276
	3296	Lt sub-lobar insula		-31.47, 19.61, 2.9	5.224
		Lt temporal sub-gyral	21	-39.77, -10.3, -8.18	5.062
		Lt frontal precentral gyrus	44	-41.29, 7.96, 7.04	4.898
	183	Lt limbic parahippocampal gyrus	36	-36.99, -29.49, -14.01	5.048
		Lt temporal fusiform gyrus	20	-45.36, 31.1, -11.6	4.889
	262	Lt temporal middle temporal gyrus	21	-56.41, -18.34, -11.93	4.834
	256	Lt temporal middle temporal gyrus	22	-47.07, -40.3, 10.47	4.789
		Lt temporal superior temporal gyrus	22	-46.98, 32.79, 5.78	4.281
	504	Lt cerebellum posterior cerebellar tonsil		-35.3, -54.7, -44.74	4.646
		Lt cerebellum posterior inferior semi-lunar lobule		-34.01, -65.01, -40.29	4.077
	182	Rt limbic anterior cingulate	10,32	11.75, 50.92, -1.51	4.569
	181	Lt limbic parahippocampal gyrus	35	-23.11, -29.56, -13.78	4.449
	114	Lt occipital cuneus	18	-11.2, -68.22, 20.6	4.274

Subject's total intracranial volume (TIV), age, and gender were used as covariates. The gray matter volume (GMV) was not significantly different to the following tests: CN<AD, CN<MCI, and MCI<AD.

CN, cognitively normal; MCI, mild cognitive impairment; AD, Alzheimer's disease; Rt, right; Lt, left; BA, Brodmann area

**Table S3. Results of the voxel-based comparisons of WMV among the three participant groups**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>CN&gt;MCI</b>					
	16133	Lt parietal precuneus		-18.37, -54.77, 42.02	6.892
		Rt limbic cingulate gyrus		8.21, -20.45, 36.26	6.124
	5899	Rt temporal sub-gyral		40.59, -26.87, -0.28	6.031
		Rt frontal inferior frontal gyrus	47	25.66, 8.57, -16.1	5.190
	5735	Lt frontal sub-gyral		-34.49, 24.66, 23.6	5.826
		Rt sub-lobar extra nuclear		6.08, 21.34, -1.71	5.097
		Lt frontal sub-gyral		-30.13, 26.07, 8.94	5.040
	415	Rt temporal superior temporal gyrus		43.02, -47.28, 20.8	5.735
	436	Rt occipital lobe		12.73, -67.26, -4.58	5.345
	3564	Lt temporal sub-gyral		-36.74, 1.16, -24.61	5.141
		Lt limbic parahippocampal gyrus		-37, -24.03, -12.14	5.137
	498	Rt sub-lobar extra-nuclear		29.5, 18.51, 11.94	5.126
		Rt frontal sub-gyral		33.54, 23.04, 23.24	4.940
	496	Rt frontal medial frontal gyrus		14.29, 53.27, 17.67	4.913
	290	Rt parietal precuneus		13.59, -56.07, 39.73	4.634
	106	Rt frontal superior frontal gyrus		20.73, 15.29, 45.26	4.633
	210	Rt frontal medial frontal gyrus	10	17.31, 46.83, -3.16	4.595
	283	Rt occipital cuneus		17.91, -80.95, 19.88	4.541
		Rt occipital precuneus	31	27.66, -75.28, 19.23	4.342
		Rt temporal sub-gyral		27.63, -68.68, 23.91	4.033
	111	Rt limbic parahippocampal gyrus		9.94, -42.61, 3.11	4.201
<b>CN&gt;AD</b>					
	262457	Lt limbic anterior cingulate		-16.28, 33.99, 13.98	65535
		Rt sub-lobar extra-nuclear		37.56, -12.31, 24.02	65535
		Rt limbic lobe cingulate gyrus		10.96, -30.25, 35.38	65535
<b>MCI&gt;AD</b>					
	83376	Rt sub-lobar extra nuclear		37.58, -12.18, 22.68	7.572
		Lt limbic anterior cingulate		-16.28, 33.99, 13.98	7.471
		Lt frontal lobe sub-gyral		-28.85, 18.42, 14.99	6.415

Subject's total intracranial volume (TIV), age, and gender were used as covariates. The white matter volume (WMV) was not significantly different to the following tests: CN<AD, CN<MCI, and MCI<AD.

CN, cognitively normal; MCI, mild cognitive impairment; AD, Alzheimer's disease; Rt, right; Lt, left; BA, Brodmann area

**Table S4. Results of the voxel-based multiple regression analyses between apparent myelin water fraction (MWF) and ages in all participant groups**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>All Group: (-) Age</b>					
	226682	Lt frontal sub-gyral		-25.19, -20.51, 42.9	6.444
		Lt parietal sub-gyral		-25.24, -37.28, 41.31	6.423
		Rt frontal sub-gyral		24.85, -18.85, 38.5	6.382

(-) indicates the negative correlation. We did not find any positive correlation between MWF and age. There were no correlations between MWF and Mini-Mental State Examination (MMSE) scores.

Rt, right; Lt, left; BA, Brodmann area

**Table S5. Results of the voxel-based multiple regression analyses between gray matter volume (GMV) and ages in all participant groups**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>All Group: (-) Age</b>					
	143802	Lt limbic parahippocampal gyrus	34	-14.64, -13.45, -20.22	6.499
		Lt temporal fusiform gyrus	20	-40.98, -6.19, -21.33	6.447
		Lt temporal sub-gyral	20	-42.47, -13.83, -15.32	6.416
	102	Lt cerebellum posterior cerebellar tonsil		-6.13, -38.21, -41.34	4.153
	145	Lt sub-lobar thalamus		-17.77, -11.98, 8.25	4.141
	293	Rt frontal superior frontal gyrus	9	18.21, 39.1, 32.61	4.075
		Rt frontal middle frontal gyrus	8	22.28, 30.17, 37.24	3.759

(-) indicates the negative correlation. We did not find any positive correlation between GMV and age. There were no correlations between GMV and Mini-Mental State Examination (MMSE) scores.

Rt, right; Lt, left; BA, Brodmann area

**Table S6. Results of the voxel-based multiple regression analyses between white matter volume (WMV) and ages in all participant groups**

Group analysis	Cluster size	Cluster location	BA	Talairach coordinates	Z score
<b>All Group: (-) Age</b>					
	122989	Lt limbic anterior cingulate		-9.18, 37.93, 2.31	6.011
		Lt frontal sub-gyral		-23.09, 37.74, 4.76	5.974
		Rt frontal sub-gyral		26.92, 35.07, 1.3	5.890
	183	Rt occipital lingual gyrus		28.02, -78.12, -9.41	4.040

(-) indicates the negative correlation. We did not find any positive correlation between WMV and age. There were no correlations between WMV and Mini-Mental State Examination (MMSE) scores.

Rt, right; Lt, left; BA, Brodmann area

**Table S7. Results of a receiver operating characteristic (ROC) curve analysis of MRI measures at the specific brain areas.**

ROI	MRI measures	CN vs MCI				CN vs AD				MCI vs AD			
		SE	SP	AUC	p	SE	SP	AUC	p	SE	SP	AUC	p
Corpus Callosum	MWF	75.00	41.38	0.517	0.8222	86.21	67.74	<b>0.799</b>	<0.0001	70.97	84.37	<b>0.779</b>	<0.0001
	GMV	81.25	48.28	0.653	0.0329	86.21	41.94	0.641	0.0493	35.48	84.37	0.509	0.9112
	WMV	87.50	41.38	0.627	0.0858	75.86	70.97	0.775	<0.0001	48.39	90.62	0.709	0.0018
Cingulate gyrus	MWF	62.50	55.17	0.536	0.6381	68.97	74.19	0.734	0.0004	74.19	62.50	0.700	0.0029
	GMV	56.25	72.41	0.666	0.0177	82.76	58.06	0.729	0.0005	29.03	90.62	0.583	0.2592
	WMV	90.62	37.93	0.660	0.0251	89.66	61.29	0.808	<0.0001	61.29	81.25	0.702	0.0030
Cingulum	MWF	59.38	58.62	0.543	0.5689	62.07	74.19	0.685	0.0087	35.48	93.75	0.655	0.0268
	GMV	65.62	68.97	0.680	0.0101	86.21	64.52	0.773	<0.0001	64.52	65.62	0.653	0.0329
	WMV	75.00	55.17	0.660	0.0253	93.10	61.29	0.820	<0.0001	61.29	81.25	0.703	0.0028
Hippocampus	MWF	56.25	65.52	0.572	0.3331	68.97	77.42	0.769	<0.0001	61.29	71.87	0.667	0.0154
	GMV	50.00	82.76	0.691	0.0058	86.21	80.65	<b>0.883</b>	<0.0001	61.29	84.37	<b>0.771</b>	<0.0001
	WMV	71.87	65.52	0.659	0.0260	93.10	70.97	<b>0.860</b>	<0.0001	77.42	68.75	<b>0.740</b>	0.0001
Middle temporal gyrus	MWF	53.13	75.86	0.597	0.1944	72.41	80.65	0.751	0.0001	77.42	68.75	0.719	0.0009
	GMV	46.88	86.21	0.666	0.0191	82.76	80.65	0.829	<0.0001	51.61	90.62	0.720	0.0008
	WMV	81.25	58.62	0.673	0.0171	75.86	77.42	0.816	<0.0001	48.39	90.62	0.701	0.0030
Parahippocampal gyrus	MWF	75.00	48.28	0.592	0.2183	86.21	64.52	0.771	<0.0001	58.06	81.25	0.684	0.0070
	GMV	68.75	65.52	0.687	0.0070	86.21	83.87	0.872	<0.0001	77.42	71.87	0.754	0.0001
	WMV	71.87	62.07	0.666	0.0187	75.86	77.42	0.840	<0.0001	87.10	53.13	0.734	0.0002
Pons	MWF	90.62	27.59	0.533	0.6614	72.41	74.19	0.733	0.0004	74.19	71.87	0.726	0.0007
	GMV	34.38	89.66	0.572	0.3375	96.55	48.39	0.740	0.0002	80.65	53.13	0.685	0.0065
	WMV	71.87	51.72	0.594	0.2072	75.86	61.29	0.720	0.0010	58.06	71.87	0.641	0.0450
Precuneus	MWF	62.50	65.52	0.615	0.1163	93.10	54.84	0.770	<0.0001	77.42	59.38	0.679	0.0092
	GMV	84.37	48.28	0.645	0.0431	89.66	58.06	0.746	0.0001	58.06	84.37	0.649	0.0385
	WMV	75.00	62.07	0.693	0.0048	79.31	70.97	0.819	<0.0001	74.19	56.25	0.678	0.0093
Thalamus	MWF	75.00	44.83	0.550	0.5113	62.07	83.87	0.734	0.0005	83.87	56.25	0.709	0.0018
	GMV	18.75	93.10	0.510	0.8981	93.10	38.71	0.679	0.0105	70.97	62.50	0.672	0.0123
	WMV	46.88	82.76	0.650	0.0385	68.97	74.19	0.722	0.0015	83.87	40.63	0.584	0.2563

CN, cognitively normal; MCI, mild cognitive impairment; AD, Alzheimer's disease; ROI, regions-of-interest; SE, Sensitivity; SP, Specificity; AUC, Area under the ROC curve; MWF, myelin water fraction; GMV, gray matter volume; WMV, white matter volume