

Supplementary Table: Details of disease and brain tissue pathology

	ID	Age	Sex	Autolysis time (hrs)	Stains: structures	Microscopic exam findings
MS	2639	72	F	11.0	H&E : FC, PC, PV WM, Hip, TC. LFB: PV WM	PVWM shows moderately-well demarcated plaque consisting of decreased staining, extensive oligodendrocyte loss, and prominent gliosis. The myelin stain shows varying amounts of residual myelination with complete sparing of the subcortical U-fibers. There is mild focal perivascular cuffing by lymphocytes. Adjacent, uninvolved white matter shows mild thickening of the small vascular structures. The neocortex is normal. There is no hypercellularity and microglial nodules are not identified. Sections of FC show extensive necrosis, hemorrhage, perivascular lymphocytic infiltration and gliosis. The hippocampus shows rare neurofibrillary tangles and granulovacuolar degeneration. There is no evidence of neuritic plaque formation.
	2660	50	F	17.0	H&E : WM, FC, Hip, CB, pons, thalamus, corpus striatum. LFB: WM	WM shows moderately well demarcated plaques consisting of complete demyelination and variable oligodendrocyte loss. The density of axons in these areas is decreased by 90%. There is no axonal hypertrophy and peripheral hypercellularity is not present. There is moderate associated gliosis. There are numerous examples of perivascular cuffing by lymphocytes. Adjacent WM shows rarefaction and significant gliosis. An area of TC adjacent to the Hip shows numerous hyperchromatic, pyknotic neurons in a background of spongiosis and endothelial proliferation. There

						is a clear demarcation with adjacent, normal appearing cortex. The remaining sections are unremarkable.
	3250	75	M	17.3	H&E & LFB: PV WM, BG	BG show a small focal region of minimal pathology in the transcapsular caudato-lenticular grey stria. The area is slightly rarefied, has minimal gliosis, and minimal lymphocytic infiltration. The area is difficult to see with the LFB myelin stain. The PVWM is unremarkable.
	3289	54	F	29.0	H&E : PV WM	Demyelinating plaque formation with complete demyelination and axonal loss. There is near complete loss of oligodendrocytes. Scattered astrocytes are also present in the plaque with focal areas of very reactive gliosis at the plaque margin. Macrophages are generally absent although numerous examples of perivascular hemosiderin laden macrophages are present. Significant inflammation is not present. The adjacent WM shows a slight increase in cellularity with mild perivascular inflammation and perivascular hemosiderin laden macrophages.
	3737	76	F	12.8	H&E & LFB: subcortical WM, posterior occipital	Partial periventricular rarefaction with 40% associated axonal loss, moderate demyelination, and mild oligodendrocyte loss. There is no evidence of macrophage activity or perivascular lymphocytic infiltration.

					WM	
	383 5	65	M	29.4	H&E & LFB: PV WM	The section shows plaque formation with up to 90% axonal loss and 75% demyelination. There is a prominent decrease in oligodendrocyte density and associated gliosis is mild. There are numerous examples of macrophage activity and perivascular lymphocytic cuffing.
	421 2	50	F	18.9	H&E : PV WM, Hip, TC. LFB: PV WM	PVWM sections show demyelinating plaque formation with up to 100% axonal loss and 100% demyelination. There is near-complete oligodendrocyte loss and prominent associated gliosis. There is no evidence of macrophage activity or perivascular lymphocytic cuffing. The TC shows normal neuronal cellularity. The Hip shows no evidence of neurodegenerative disease or hypoxia.
	499 5	63	F	35.5	H&E : BS WM, Hip, TC. LFB: BS WM	CB shows a small focus of subcortical demyelinating plaque formation with up to 40% axonal loss and 60% demyelination. There is a mild decrease in oligodendrocyte density and minimal associated gliosis. There is no evidence of macrophage activity or perivascular lymphocytic cuffing. TC is normal. Hip is normal without evidence of neurodegeneration or hypoxia.

502 2	71	M	6.0	Neur ofila ment /CD6 8 IHC & LFB- PAS: pons CB WM	Sections from the pons and cerebral WM confirm the presence of multiple, predominantly inactive MS plaques. There is evidence of focal myelin loss with relative preservation of axons, gliosis, and relatively scant, chronic inflammation.
502 4	67	F	11.8	Neur ofila ment /CD6 8 IHC & LFB: FC, BG, Hip, Midb rain, pons, med ulla/s pinal cord, CB, front al WM, WM plaq ue	Sections show evidence of mild cerebral arteriosclerosis. Sections also show multiple inactive multiple sclerosis plaques. There is evidence of focal myelin loss with relative preservation of axons and gliosis. There is only very mild focal chronic inflammation.
502 5	73	M	3.4	Neur ofila ment /CD6 8 IHC & LFB: PV WM, FC, BG, Hip/	Sections show evidence of cerebral arteriosclerosis and MS. Sampled plaques show myelin loss, gliosis, relative preservation of axons and only moderate macrophagic infiltration at the margin of some of the lesion.

					WM plaque, midbrain, pons, medulla/spinal cord, CB	
	5068	62	M	10.7	H&E : PV WM, Hip, TC. LFB: PV WM	PVWM shows plaque formation with up to 90% axonal loss and 100% demyelination. There is 100% oligodendrocyte loss and associated gliosis. There is no evidence of macrophage activity or perivascular lymphocytic cuffing. The neocortex contains normal neuronal cellularity and normal subcortical WM. Hip is also normal without evidence of neurodegeneration or hypoxia.
	5090	65	M	26.9	H&E : PV WM, Hip. LFB: PV WM	PVWM shows an irregular area of extensive myelin loss with relative axonal preservation. There is associated gliosis and occasional macrophages. There is no perivascular lymphocytic cuffing. Hip displays well populated pyramidal and granular cell layers without evidence of neurodegeneration or acute hypoxic/ischemic change.
	5093	74	M	8.5	H&E : PV WM, Amy. LFB: PV WM	PVWM shows small fairly well-defined foci of myelin loss with comparative preservation of axons and occasional reactive astrocytes. Those areas are highlighted by LFB stain and could be consistent with the clinical diagnosis of MS. Amy and adjacent TC show no significant neuropathologic changes on H&E.
	5102	60	F	14.7	H&E : PV WM,	PVWM shows fairly well defined area of demyelination and relative preservation of axons with scattered

					Hip. LFB: PV WM	macrophages. Pathologically similar lesion is present in the PVWM in Hip section. Hip displays well-populated pyramidal and granular cell layers without evidence of neurodegeneration or acute hypoxic/ischemic change
	5115	68	F	24.0	H&E : FC, PV WM, Hip. LFB: PV WM	Sections of neocortex show normal neuronal laminations and populations without significant hypoxic/ischemic neuron loss or fibrous gliosis. Section of the PVWM shows a large fairly well defined area of demyelination with comparative axonal preservation. Occasional foamy macrophages, hyperplastic astrocytes, and scant perivascular small lymphocytes are noted. LFB stain highlights area of myelin loss. These findings are consistent with a chronic plaque or MS. Section of the Hip shows well-populated pyramidal and granular cell layers without acute hypoxic/ischemic changes or Hip sclerosis. In the adjacent temporal PVWM there is a well-defined area of myelin loss similar to the one in the frontal WM.
	512 3	79	F	24.8	H&E : FC, PV WM, Hip. LFB: PV WM	Neocortex shows well preserved neuronal laminations and populations without significant hypoxic/ischemic neuron loss or fibrous gliosis. The Hip shows granulovacuolar degeneration and occasional, intraneuronal and "ghost", neurofibrillary tangles in the pyramidal cell layer and entorhinal cortex. There also is focal myelin pallor of the adjacent PVWM. PVWM displays somewhat ill-defined areas of myelin pallor with relative axonal preservation which are highlighted by the LFB special stain.

5268	66	M	16.8	H&E : FC, posterior cingulate gyru s, occipital WM, pons	Neocortex shows normal neuronal laminations and populations. There are arteriosclerotic changes with microhemorrhages, could be consistent with hypertension. Posterior cingulate gyrus, occipital WM, and pons clearly show old demyelination [sic] plaques.
5292	70	F	16.0	H&E & LFB: BG, parietal PV WM, pons	Old demyelination [sic] plaques are seen in BG and PVWM. The loss of myelin is supported by the loss of blue stain using LFB.
5308	54	F	9.3	H&E & LFB: frontal WM, thalamus, pons tegmentum	Old demyelination [sic] plaques are seen in all sections. The LFB stain confirmed the loss of myelin. Some WM blood vessels show a mild degree of perivascular lymphocytic infiltrate. The CB cortex is normal.
5320	74	F	14.9	H&E : pons tegmentum, CB WM, frontal PV WM, parietal gray matt	Old demyelination [sic] plaques are seen in CB WM and PVWM. A CD68 stain of the frontal PVWM highlights the macrophages in the demyelination [sic] lesion.

					er. CD68 IHC: PV WM	
MS+S	296 6	55	F	15.0	PV WM (stains not indicated)	Section of the parietal PVWM shows extensive demyelination and axonal loss, reactive astrocytes, rare lipid-laden macrophages and sparse chronic perivascular inflammation consistent with MS.
	326 0	47	F	11.5	H&E & LFB: PV WM, CB	PVWM shows demyelinating plaque formation with extensively decreased intra-plaque oligodendrocyte cellularity (90-100%), extensive axonal loss, and extensive adjacent associated gliosis. Macrophages and perivascular lymphocytic cuffing are not found. The LFB stain shows complete demyelination. The adjacent cortex and WM are unremarkable. The section of CB is also unremarkable.
	350 2	78	M	15.5	H&E : periventricular plaque, BG, occipital subcortex . LFB: periventricular plaque	The demyelinating plaque shows complete oligodendrocyte loss, complete axonal dropout, and complete demyelination. There is moderate associated gliosis. There is minimal perivascular cuffing but macrophage activity is not observed. Adjacent cortex and WM are unremarkable. The occipital cortical sections show small areas of subcortical pallor. The section of BG shows no evidence of demyelination, infarction, or necrosis. Scattered small vascular structures show medial thickening.

454 6	59	M	38.5	H&E : WM plaq ue, TC, Hip, thala mus. LFB: WM plaq ue	WM plaque shows irregular foci of demyelination with up to 80% axonal loss and 100% demyelination. There is a marked decrease in oligodendrocyte density with moderate associated gliosis and scattered corpora amylacea. Significant macrophage activity and perivascular lymphocytic cuffing are absent. The adjacent uninvolved WM also shows scattered corpora amylacea but is otherwise normal. Thalamus shows a similar process but with less axonal loss and demyelination. Hip and TC are normal
475 0	83	F	19.4	H&E : PV WM, Hip, TC, Pu, centr um semi ovali , pons. LFB: PV WM	PVWM shows a small area of demyelination with up to 50% axonal loss, 50% demyelination, and scattered corpora amylacea. Oligodendrocyte loss and gliosis are minimal and there is no associated macrophage activity or perivascular lymphocytic cuffing. The section of right centrum semiovali shows a very small focus of demyelination with up to 75% axonal loss, vacuolization, oligodendrocyte loss, and gliosis. An LFB myelin stain was not done on this section but demyelination appears from the H&E to be prominent. There is also associated macrophage activity and perivascular lymphocytic cuffing. The section of Left Pu contains an area of cavity formation secondary to liquefactive necrosis with scattered residual macrophages and adjacent gliosis. The section of pons is unremarkable. The section of TC shows normal neocortical neuronal cellularity and normal subcortical WM. The Hip is normal without evidence of

						neurodegeneration or hypoxia.
	480 3	57	M	29.7	H&E : PV WM, Hip, TC. LFB: PV WM	PVWM shows demyelinating plaque formation with up to 50% axonal loss and 50% demyelination. There is a variable decrease in oligodendrocyte density. There is minimal associated gliosis. There are scattered distended macrophages and examples of perivascular lymphocytic cuffing. The neocortex contains normal neuronal cellularity. Hip contains scattered shrunken and hyperchromatic neurons.
	486 9	54	F	12.3	H&E : PV WM, FC, Hip, TC. LFB: PV WM	PVWM shows mild periventricular demyelinating plaque formation with up to 50% axonal loss and 50% demyelination. There is a variable decrease in oligodendrocyte density. Associated gliosis is mild. There is scattered evidence of macrophage activity and minimal perivascular lymphocytic cuffing. The neocortex shows normal neuronal cellularity and normal subcortical WM. The Hip is also normal without evidence of neurodegeneration or hypoxia.
<p>AD = Alzheimer's disease; Amy = amygdala; BG = basal ganglia; BS = brain stem; CA = cancer; CB = cerebellum; COPD = chronic obstructive pulmonary disease; CVA = cerebrovascular accident; FC = frontal cortex; H&E = hematoxylin & eosin stain; Hip = hippocampus; LFB = Luxol Fast Blue Stain; MS = multiple sclerosis; PAS = Periodic acid-Schiff; PC = parietal cortex; Pu = putamen; PVWM = periventricular white matter; RRMS = relapsing-remitting MS; SPMS = secondary progressive MS; TC = temporal cortex; UTI = urinary tract infection; WM = white matter</p>						