Supplementary Material 1. Immunostains.

Antigen	Pre-treatment	Dilution	Primary antibody incubation	Secondary antibody 1:200		Target	Source
				Swine αrabbit DakoE0353	*Rabbit αmouse DakoE0354*		
NF200	Protease 1 4’	1:200	32min		32min	Neurofilaments	Sigma N5389
SMI94	Extended CC1	1:500	32min		32min	Myelin basic protein	Covance SMI94-R
CD68	Standard Ribo CC	1:100	1h		32min	Lysosome-associated membrane protein	Dako PG-M1
CD20	Mild Ribo CC	1:200	1h		32min	Clusters of differentiation of B cells	Dako 7D1
CD3	Standard CC1	1:100	1h		32min	Clusters of differentiation of T cells	Leica PA0122
CD8	Standard CC1	1:100	1h		32min	Clusters of differentiation of cytotoxic T cells	Dako M7103
IBA1	Standard CC1	1:250	1h	32min		Ionizing calcium-binding adaptor molecule 1	Wako 019-19741
GFAP	Protease 1 4’	1:1000	32min	32min		Glial fibrillary acidic protein	Dako Z0334
COX4	Standard CC1	1:100	1h		32min	Mitochondrial inner membrane protein	Abcam ab14744
VDAC	Standard CC1	1:100	1h	32min	32min	Mitochondrial outer membrane protein	Abcam ab15895

The table shows details of immunostains with antibodies, targets and processing.

*1Ribo CC: citrate-based buffer and ProClin 300.

**CC1: cell conditioning 1.

Supplementary Material 2. Differences in CD20, CD3 and CD8 immunostaining intensity between ROIs.

When comparing immunostaining intensity between MS regions, CD20 immunostaining intensity was higher in WM lesions (Intensity=0.954±0.947; Coeff=0.374; 95%CI=0.151, 0.598; p=0.001), lower in cortical NAGM (Intensity=0.316±0.322; Coeff=-0.165; 95%CI=-0.298, -0.031; p=0.015), and not different in GM lesions (Intensity=0.379±0.371; Coeff=-0.092; 95%CI=-0.292, 0.108; p=0.368), when compared with NAWM (Intensity=0.531±0.582, statistical reference). CD3 immunostaining intensity was lower in cortical NAGM (Intensity=0.319±0.624; Coeff=-0.277; 95%CI=-0.519, -0.036; p=0.024), and not different in WM lesions (Intensity=0.442±0.411; Coeff=-0.210; 95%CI=-0.578, 0.157; p=0.262), and GM lesions (Intensity=0.559±0.536; Coeff=-0.168; 95%CI=-0.564, 0.227; p=0.404), when compared with NAWM (Intensity=0.495±0.713, statistical reference). CD8 immunostaining intensity was higher in WM lesions (Intensity=1.070±1.251; Coeff=5.674; 95%CI=2.014, 9.334; p=0.002), and not different in cortical NAGM (Intensity=0.756±1.059; Coeff=-0.097; 95%CI=-2.684, 2.489; p=0.941), and GM lesions (Intensity=0.821±1.180; Coeff=0.115; 95%CI=-3.779, 4.009; p=0.954), when compared with NAWM (Intensity=0.748±1.103, statistical reference),.

Active WM lesions (n=5) presented with higher immunostaining intensity for CD20 (Intensity=0.998±0.912; Coeff=0.979; 95%CI=0.502, 1.455; p<0.001), CD3 (Intensity=0.457±0.422; Coeff=0.473; 95%CI=0.269, 0.677; p<0.001), and CD8 (Intensity=1.556±1.543; Coeff=0.876; 95%CI=0.486,

1.266; p<0.001), when compared with inactive WM lesions (n=23) (Intensity=0.948±0.975, 0.400±0.411, and 0.955±1.225, respectively). Active cortical GM lesions (n=2) presented with higher immunostaining intensity for CD20 (Intensity=0.741±0.366; Coeff=0.394; 95%CI=0.236, 0.551; p<0.001), CD3 (Intensity=0.583±0.561; Coeff=0.499; 95%CI=0.241, 0.757; p<0.001), and CD8 (Intensity=0.927±1.118; Coeff=0.843; 95%CI=0.274, 1.413; p=0.004), when compared with inactive cortical GM lesions (n=31) (Intensity=0.316±0.380, 0.303±0.254, and 0.703±0.964, respectively).