

Supplementary Table 1. Summary of demographics and baseline characteristics of the cross-sectional MRI multiple sclerosis cohorts stratified by African Americans and Caucasians Americans.

Cross-sectional cohort	African Americans	Caucasian Americans	p-value
	n=32	n=64	
Average age, years (SD)	33.7 (13.4)	37.5 (11.0)	0.261 ^a
Female, n (%)	25 (78.1%)	50 (78.1%)	1 ^b
MS subtype:			0.496 ^c
RRMS, n (%)	29 (90.6%)	53 (82.8%)	
PPMS, n (%)	2 (6.3%)	5 (7.8%)	
SPMS, n (%)	1 (3.1%)	6 (9.4%)	
History of optic neuritis, n (%)	23 (71.9%)	39 (60.9%)	0.291 ^b
Disease duration, years (mean, SD)	5.34 (4.7%)	5.88 (6.4%)	0.938 ^a
On DMT (at baseline), n (%)	22 (68.8%)	35 (54.7%)	0.186 ^b
Acute optic neuritis within 6 months of baseline MRI, n (%)	10 (31.3%)	22 (34.4%)	0.759 ^b
EDSS, median (Q1-Q3)	3 (1.50-3.75)	2 (1.25-3.50)	0.161 ^a

^aWilcoxon rank-sum test; ^bChi2 test; ^c Fisher's exact test

AA=African Americans, CA=Caucasian Americans, MRI = magnetic resonance imaging, SD= standard deviation, RRMS = relapsing-remitting multiple sclerosis, PPMS= primary progressive multiple sclerosis, SPMS= secondary progressive multiple sclerosis, EDSS=expanded disability status scale, Q1 = first quartile, Q3 = third quartile.

Supplementary Table 2. Demographics of the OCT healthy control cohorts.

	African Americans	Caucasian Americans	p-value
Cross-sectional cohort	n=31	n=61	
Female, n (%)	25 (80.7%)	49 (80.3%)	0.971 ^a
Average age, years (SD)	34.6 (11.0)	34.5 (10.6)	0.996 ^b
Longitudinal cohort	n=17	n=33	
Female, n (%)	16 (94.1)	31 (93.9)	0.980 ^a
Average age, years (SD)	31.2 (9.0)	31.1 (8.6)	0.949 ^b
Follow-up duration, years (SD)	1.9 (1.4)	2.8 (2.4)	0.104 ^b

^aChi2 test; ^bWilcoxon rank-sum test;

OCT = optical coherence tomography, SD= standard deviation

Supplementary Table 3. Comparisons of regional (substructure) atrophy (percentage change/year)¹ of the brain in multiple sclerosis patients including effect estimates and corresponding confidence intervals from models 2-4.

	African American (n=22)		Caucasian Americans (n=60)		AA vs. CA
	%/year	(95 % CI)	%/year	(95 % CI)	p-value
Model 2¹					
Whole Brain	-0.53%	(-0.76% to -0.30%)	-0.30%	(-0.39% to -0.21%)	0.083
Cortical GM	-0.87%	(-1.16% to -0.58%)	-0.46%	(-0.58% to -0.34%)	0.012
Cerebral WM	-0.69%	(-0.96% to -0.41%)	-0.34%	(-0.46% to -0.22%)	0.038
Whole Thalamus	-1.08%	(-1.59% to -0.57%)	-0.71%	(-0.96% to -0.45%)	0.292
Nuclear Thalamus	-1.50%	(-2.03% to -0.97%)	-0.66%	(-0.92% to -0.41%)	0.021
Deep GM	-0.95%	(-1.27% to -0.63%)	-0.62%	(-0.77% to -0.48%)	0.104
T2 Lesion	10.96%	(4.01% to 18.37%)	4.67%	(1.64% to 7.77%)	0.006
Model 3²					
Whole Brain	-0.53%	(-0.76% to -0.30%)	-0.30%	(-0.39% to -0.21%)	0.080
Cortical GM	-0.87%	(-1.16% to -0.58%)	-0.46%	(-0.58% to -0.34%)	0.012

Cerebral WM	-0.69%	(-0.96% to -0.41%)	-0.34%	(-0.47% to -0.22%)	0.039
Whole Thalamus	-1.08%	(-1.59% to -0.57%)	-0.70%	(-0.96% to -0.45%)	0.283
Nuclear Thalamus	-1.50%	(-2.03% to -0.97%)	-0.66%	(-0.91% to -0.41%)	0.020
Deep GM	-0.95%	(-1.27% to -0.63%)	-0.63%	(-0.78% to -0.48%)	0.120
T2 Lesion	NA	NA	NA	NA	NA
Model 4³					
Whole Brain	-0.53%	(-0.76% to -0.30%)	-0.30%	(-0.39% to -0.21%)	0.084
Cortical GM	-0.87%	(-1.16% to -0.58%)	-0.46%	(-0.58% to -0.34%)	0.012
Cerebral WM	-0.69%	(-0.96% to -0.41%)	-0.34%	(-0.46% to -0.22%)	0.038
Whole Thalamus	-1.08%	(-1.59% to -0.57%)	-0.71%	(-0.96% to -0.45%)	0.292
Nuclear Thalamus	-1.50%	(-2.03% to -0.97%)	-0.66%	(-0.92% to -0.41%)	0.021
Deep GM	-0.95%	(-1.27% to -0.63%)	-0.62%	(-0.77% to -0.48%)	0.104
T2 Lesion	10.96%	(4.02% to 18.37%)	4.65%	(1.65% to 7.70%)	0.006

¹ Models adjusted for sex, age at baseline, disease duration and history of optic neuritis. ² Models adjusted for sex, age at baseline, disease duration, history optic neuritis and rates of lesion accumulation. ³ Models adjusted for sex, age at baseline, disease duration, history of optic neuritis and time since acute optic neuritis (if within 6 months of the baseline MRI).

AA= African Americans, CA= Caucasian Americans, CI= confidence interval, GM=gray matter, WM=white matter.

Supplementary Table 4. Comparisons of regional substructure atrophy coefficients [volume fractions (normalized to intracranial volume) /year]¹ of the brain over time.

Substructure volume atrophy (cerebral volume fraction/year)					
	African Americans n=22		Caucasian Americans n=60		AA vs CA patients
	Coefficient	95% CI	Coefficient	95% CI	p-value ¹
Whole brain	-0.0042	(-0.0060 to -0.0023)	-0.0024	(-0.0032 to -0.0017)	0.091
Cortical GM	-0.0032	(-0.0042 to -0.0021)	-0.0017	(-0.0022 to -0.0013)	0.015
Cerebral WM	-0.0018	(-0.0026 to -0.0011)	-0.0010	(-0.0013 to -0.0006)	0.039
Whole thalamus	-0.0001	(-0.0002 to -0.0001)	-0.0001	(-0.0001 to -0.0001)	0.290
Nucleus thalamus	-0.0001	(-0.0002 to -0.0001)	-0.0001	(-0.0001 to -0.00003)	0.021
Deep GM	-0.0003	(-0.0004 to -0.0002)	-0.0002	(-0.0002 to -0.0002)	0.102
T2 Lesion	0.0006	(0.0003 to 0.0008)	0.0002	(0.0001 to 0.0003)	0.006

¹ Models adjusted for sex and age at baseline.

AA= African Americans, CA= Caucasian Americans, CI= confidence interval, GM=gray matter, WM=white matter.

Supplementary Table 5. Comparisons of retinal layer atrophy (percentage change/year) for Model 2 including effect estimates and confidence intervals in patients with multiple sclerosis

	African Americans (n=116)		Caucasian Americans (n=116)		AA vs. CA
	%/year	95 % CI	%/year	95 % CI	p-value
p-RNFL	-1.09%	(-1.30% to -0.88%)	-0.75%	(-0.93% to -0.56%)	0.018
GCIP	-0.76%	(-0.94% to -0.59%)	-0.40%	(-0.56% to -0.24%)	0.009
INL	-0.29%	(-0.37% to -0.22%)	-0.32%	(-0.38% to -0.26%)	0.439
ONL	-0.27%	(-0.36% to -0.18%)	-0.16%	(-0.23% to -0.08%)	0.076
AMT	-0.29%	(-0.37% to -0.23%)	-0.15%	(-0.21% to -0.09%)	0.018

¹Percentage of change derived by the natural logarithm of each variable and adjusted for sex, age at baseline, disease duration and history of optic neuritis.

Supplementary Table 6. Comparisons of retinal layer atrophy ($\mu\text{m}/\text{year}$).

Retinal layer atrophy ($\mu\text{m}/\text{year}$)							
	African Americans			Caucasian Americans			AA vs CA
	$\mu\text{m}/\text{year}$	95% CI	p-value	$\mu\text{m}/\text{year}$	95% CI	p-value	p-value ¹
Healthy controls	n=17			n=33			
p-RNFL	-0.48	(-1.02 to 0.06)	0.080	-0.34	(-0.62 to -0.06)	0.017	0.648
GCIP	-0.28	(-0.55 to -0.01)	0.043	-0.10	(-0.26 to 0.06)	0.211	0.272
INL	-0.15	(-0.27 to -0.03)	0.019	-0.09	(-0.16 to -0.01)	0.020	0.383
ONL	-0.12	(-0.31 to 0.06)	0.184	-0.12	(-0.21 to 0.02)	0.019	0.927
AMT	-0.42	(-1.04 to 0.19)	0.181	-0.25	(-0.61 to 0.11)	0.172	0.632
Multiple sclerosis	n=116			n=116			
p-RNFL	-0.90	(-1.07 to -0.73)	<0.001	-0.63	(-0.78 to -0.49)	<0.001	0.019
GCIP	-0.48	(-0.59 to -0.37)	<0.001	-0.28	(-0.38 to -0.18)	<0.001	0.009
INL	-0.13	(-0.16 to -0.09)	<0.001	-0.14	(-0.17 to -0.11)	<0.001	0.444
ONL	-0.18	(-0.24 to -0.12)	<0.001	-0.10	(-0.16 to -0.05)	<0.001	0.076
AMT	-0.87	(-1.08 to -0.66)	<0.001	-0.45	(-0.64 to -0.26)	<0.001	0.003

¹ Models adjusted for sex and age at baseline

AA=African Americans, CA=Caucasian Americans, CI= confidence interval, p-RNFL=peripapillary retinal nerve fiber layer, GCIP =ganglion cell + inner plexiform layer, INL =inner nuclear layer, ONL =outer nuclear layer, AMT =average macular thickness

Supplementary figure 1. Segmentation results of a macular B-scan acquired with Cirrus-HD OCT device. This technique detects the boundaries between the layers and identifies the different retinal layers: Retinal nerve fiber layer (RNFL), ganglion cell layer + inner plexiform layer (GCIP), inner nuclear layer (INL), outer plexiform layer (OPL), outer nuclear layer (ONL), inner photoreceptor segment (IPS), outer photoreceptor segment (OPS), retinal pigment epithelium (RPE).

