

Supplementary Table 7. Heritability enrichment in tissues and cell types for MS severity

Tissue	Tissue category	Coefficient	Coefficient (s.e)	Coefficient P	FDR
Brain_Hypothalamus	CNS	4.9E-08	1.3E-08	4.7E-05	5.9E-03
Brain_Substantia_nigra	CNS	4.9E-08	1.3E-08	5.7E-05	5.9E-03
A08.186.211.464.Limbic.System	CNS	5.2E-08	1.4E-08	1.2E-04	8.2E-03
A08.186.211.464.710.225.Entorhinal.Cortex	CNS	4.7E-08	1.4E-08	4.0E-04	0.017
A08.186.211.730.885.287.500.571.735.Visual.Cortex	CNS	4.6E-08	1.4E-08	4.1E-04	0.017
Brain_Spinal_cord_(cervical_c-1)	CNS	4.1E-08	1.2E-08	5.5E-04	0.018
A08.186.211.730.885.287.500.Cerebral.Cortex	CNS	4.6E-08	1.4E-08	6.2E-04	0.018
Brain_Amygdala	CNS	3.9E-08	1.2E-08	7.6E-04	0.019
A08.186.211.464.405.Hippocampus	CNS	4.3E-08	1.4E-08	8.2E-04	0.019
Brain_Hippocampus	CNS	3.9E-08	1.2E-08	9.6E-04	0.020
A08.186.211.Brain	CNS	3.8E-08	1.3E-08	2.4E-03	0.044
Brain_Cortex	CNS	3.4E-08	1.2E-08	2.9E-03	0.050
Brain_Nucleus_accumbens_(basal_ganglia)	CNS	3.3E-08	1.3E-08	4.5E-03	0.067
Brain_Anterior_cingulate_cortex_(BA24)	CNS	3.2E-08	1.2E-08	4.6E-03	0.067
Brain_Putamen_(basal_ganglia)	CNS	3.2E-08	1.2E-08	5.2E-03	0.071
Brain_Frontal_Cortex_(BA9)	CNS	3.0E-08	1.2E-08	7.1E-03	0.086
A08.186.211.730.885.287.500.270.Frontal.Lobe	CNS	3.5E-08	1.5E-08	7.4E-03	0.086
Brain_Cerebellar_Hemisphere	CNS	3.2E-08	1.3E-08	7.6E-03	0.086
Brain_Caudate_(basal_ganglia)	CNS	2.9E-08	1.2E-08	8.6E-03	0.093
A08.186.211.730.885.287.500.670.Parietal.Lobe	CNS	3.2E-08	1.4E-08	0.011	0.107
A11.872.580.Mesenchymal.Stem.Cells	Other	3.3E-08	1.4E-08	0.011	0.107
A07.541.358.Heart.Atria	Cardiovascular	3.1E-08	1.4E-08	0.012	0.109
A08.186.211.132.Brain.Stem	CNS	3.1E-08	1.4E-08	0.012	0.109
A07.541.358.100.Atrial.Appendage	Cardiovascular	3.1E-08	1.4E-08	0.014	0.120
A08.186.211.730.885.287.249.Basal.Ganglia	CNS	3.1E-08	1.4E-08	0.015	0.121
Brain_Cerebellum	CNS	2.7E-08	1.3E-08	0.015	0.121
Artery_Coronary	Cardiovascular	3.0E-08	1.5E-08	0.023	0.172
A08.186.211.730.885.287.249.487.Corpus.Striatum	CNS	2.6E-08	1.4E-08	0.034	0.245
A11.436.294.064.Glucagon.Secreting.Cells	Other	3.0E-08	1.6E-08	0.035	0.245
A11.329.629.Osteoblasts	Musculoskeletal-connective	2.8E-08	1.6E-08	0.042	0.289
A03.556.249.124.Ileum	Digestive	3.0E-08	1.8E-08	0.049	0.322
A02.165.Cartilage	Musculoskeletal-connective	2.3E-08	1.5E-08	0.068	0.428
A15.382.520.604.700.Spleen	Blood or Immune	2.3E-08	1.6E-08	0.069	0.428
A11.118.637.555.567.562.B.Lymphocytes	Blood or Immune	2.2E-08	1.5E-08	0.079	0.474
A15.145.229.637.555.567.562.725.Plasma.Cells	Blood or Immune	2.1E-08	1.5E-08	0.087	0.496
A08.186.211.865.428.Metencephalon	CNS	1.9E-08	1.4E-08	0.090	0.496
Spleen	Blood or Immune	2.0E-08	1.5E-08	0.090	0.496
A03.734.414.Islets.of.Langerhans	Other	2.2E-08	1.6E-08	0.092	0.496
A15.145.229.637.555.Leukocytes.Mononuclear	Blood or Immune	2.2E-08	1.7E-08	0.101	0.529
A10.615.789.Serous.Membrane	Other	1.8E-08	1.5E-08	0.109	0.546
Breast_Mammary_Tissue	Other	1.8E-08	1.5E-08	0.109	0.546
A15.382.490.555.567.Lymphocytes	Blood or Immune	1.8E-08	1.5E-08	0.116	0.567
A03.556.124.684.Intestine..Small	Digestive	2.1E-08	1.8E-08	0.120	0.572
A02.835.232.834.151.Cervical.Vertebrae	Musculoskeletal-connective	1.8E-08	1.6E-08	0.126	0.589
Pancreas	Other	1.7E-08	1.5E-08	0.138	0.629
A08.186.211.132.810.428.200.Cerebellum	CNS	1.4E-08	1.4E-08	0.151	0.673
A10.690.467.Muscle..Smooth	Musculoskeletal-connective	1.6E-08	1.6E-08	0.157	0.682
Heart_Left_Ventricle	Cardiovascular	1.4E-08	1.4E-08	0.160	0.682
A10.549.Lymphoid.Tissue	Blood or Immune	1.6E-08	1.7E-08	0.163	0.682
Cells_Transformed_fibroblasts	Other	1.4E-08	1.5E-08	0.173	0.708
A05.360.319.887.Vulva	Other	1.4E-08	1.5E-08	0.178	0.709
A08.186.211.653.Mesencephalon	CNS	1.4E-08	1.6E-08	0.187	0.709
A02.835.583.443.800.800.Synovial.Fluid	Blood or Immune	1.6E-08	1.9E-08	0.191	0.709
A11.872.190.Embryonic.Stem.Cells	Other	1.4E-08	1.6E-08	0.191	0.709
Cells_EBV-transformed_lymphocytes	Blood or Immune	1.5E-08	1.7E-08	0.192	0.709
A11.329.228.Fibroblasts	Musculoskeletal-connective	1.4E-08	1.6E-08	0.198	0.709
A15.145.229.637.555.567.569.200.CD4.Positive.T.Lymphocytes	Blood or Immune	1.5E-08	1.7E-08	0.200	0.709
A07.541.Heart	Cardiovascular	1.1E-08	1.3E-08	0.201	0.709
Stomach	Digestive	1.2E-08	1.5E-08	0.212	0.736
A10.165.450.300.Cicatrix	Musculoskeletal-connective	1.1E-08	1.4E-08	0.218	0.742
A03.734.Pancreas	Other	1.1E-08	1.5E-08	0.221	0.742
A03.556.875.875.Stomach	Digestive	1.2E-08	1.6E-08	0.225	0.744
A11.872.378.590.635.Granulocyte.Macrophage.Progenitor.Cells	Blood or Immune	1.1E-08	1.5E-08	0.234	0.760
Small_Intestine_Terminal_Ileum	Digestive	1.0E-08	1.5E-08	0.239	0.766
A15.382.490.555.567.622.Lymphocytes..Null	Blood or Immune	1.1E-08	1.7E-08	0.256	0.791

A10.549.400.Lymph.Nodes	Blood or Immune	1.0E-08	1.6E-08	0.256	0.791
Colon_Sigmoid	Digestive	1.0E-08	1.6E-08	0.259	0.791
A14.724.Pharynx	Other	8.9E-09	1.4E-08	0.264	0.793
A11.118.637.555.567.562.440.Precursor.Cells..B.Lymphoid	Blood or Immune	9.0E-09	1.5E-08	0.271	0.793
Artery_Tibial	Cardiovascular	8.5E-09	1.4E-08	0.271	0.793
A06.407.900.Thyroid.Gland	Endocrine	8.5E-09	1.5E-08	0.281	0.798
A11.436.Epithelial.Cells	Other	8.5E-09	1.5E-08	0.285	0.798
A10.615.284.473.Chorion	Other	8.4E-09	1.5E-08	0.288	0.798
A10.336.707.Prostate	Endocrine	7.5E-09	1.4E-08	0.293	0.798
A07.541.560.Heart.Ventricles	Cardiovascular	7.1E-09	1.3E-08	0.295	0.798
Uterus	Other	8.1E-09	1.5E-08	0.298	0.798
A15.382.490.315.583.Neutrophils	Blood or Immune	8.9E-09	1.7E-08	0.301	0.798
A09.371.729.Retina	CNS	7.1E-09	1.4E-08	0.304	0.798
A15.382.520.604.800.Palatine.Tonsil	Blood or Immune	7.3E-09	1.5E-08	0.316	0.819
A10.165.450.300.425.Keloid	Musculoskeletal-connective	6.2E-09	1.4E-08	0.329	0.844
A11.118.637.555.567.569.200.700.T.Lymphocytes..Regulatory	Blood or Immune	7.5E-09	1.8E-08	0.339	0.846
A11.118.637.Leukocytes	Blood or Immune	7.7E-09	1.9E-08	0.342	0.846
Thyroid	Endocrine	5.6E-09	1.4E-08	0.346	0.846
A07.231.908.670.874.Umbilical.Veins	Cardiovascular	6.4E-09	1.6E-08	0.347	0.846
A11.436.275.Endothelial.Cells	Other	6.0E-09	1.7E-08	0.359	0.863
A17.815.Skin	Other	5.6E-09	1.6E-08	0.364	0.863
Nerve_Tibial	Other	4.4E-09	1.3E-08	0.366	0.863
A07.231.Blood.Vessels	Cardiovascular	4.9E-09	1.6E-08	0.379	0.883
A05.360.319.679.690.Myometrium	Musculoskeletal-connective	3.4E-09	1.4E-08	0.403	0.905
Colon_Transverse	Digestive	3.8E-09	1.6E-08	0.404	0.905
Lung	Other	3.7E-09	1.5E-08	0.406	0.905
Testis	Endocrine	2.9E-09	1.3E-08	0.407	0.905
A11.329.830.Stromal.Cells	Musculoskeletal-connective	3.6E-09	1.6E-08	0.411	0.905
A08.186.211.730.317.Diencephalon	CNS	3.8E-09	1.8E-08	0.415	0.905
Artery_Aorta	Cardiovascular	2.7E-09	1.3E-08	0.420	0.906
A10.690.Muscles	Musculoskeletal-connective	2.4E-09	1.5E-08	0.438	0.934
Cervix_Ectocervix	Other	1.5E-09	1.4E-08	0.457	0.954
A11.872.700.500.Induced.Pluripotent.Stem.Cells	Other	1.7E-09	1.7E-08	0.460	0.954
A08.186.211.730.317.357.352.435.Hypothalamo.Hypophyseal.System	CNS	1.5E-09	1.7E-08	0.464	0.954
A07.231.908.Veins	Cardiovascular	1.4E-09	1.6E-08	0.465	0.954
A15.145.846.Serum	Blood or Immune	1.1E-09	1.5E-08	0.471	0.955
A07.541.510.110.Aortic.Valve	Cardiovascular	6.0E-10	1.5E-08	0.484	0.972
Adipose_Visceral_(Omentum)	Adipose	3.8E-10	1.3E-08	0.488	0.972
A11.620.520.Myocytes..Smooth.Muscle	Musculoskeletal-connective	7.6E-11	1.6E-08	0.498	0.973
A05.810.453.324.Kidney.Cortex	Other	7.1E-11	1.5E-08	0.498	0.973
A05.810.890.Urinary.Bladder	Other	-7.6E-10	1.8E-08	0.517	0.977
A03.556.500.760.Salivary.Glands	Digestive	-7.0E-10	1.6E-08	0.518	0.977
A03.556.124.369.Intestinal.Mucosa	Digestive	-7.4E-10	1.6E-08	0.518	0.977
Heart_Atrial_Appendage	Cardiovascular	-7.5E-10	1.4E-08	0.521	0.977
A11.443.Erythroid.Cells	Blood or Immune	-1.8E-09	1.8E-08	0.541	0.977
A15.145.229.Blood.Cells	Blood or Immune	-1.9E-09	1.8E-08	0.543	0.977
A15.382.812.Mononuclear.Phagocyte.System	Blood or Immune	-2.0E-09	1.6E-08	0.550	0.977
A06.407.071.Adrenal.Glands	Endocrine	-2.1E-09	1.4E-08	0.558	0.977
A05.360.444.Genitalia..Male	Other	-1.9E-09	1.3E-08	0.558	0.977
A11.329.171.Chondrocytes	Musculoskeletal-connective	-2.4E-09	1.5E-08	0.563	0.977
Ovary	Other	-2.3E-09	1.4E-08	0.563	0.977
A11.872.040.Adult.Stem.Cells	Other	-2.7E-09	1.6E-08	0.565	0.977
Esophagus_Mucosa	Digestive	-2.7E-09	1.5E-08	0.573	0.977
Esophagus_Gastroesophageal_Junction	Digestive	-2.6E-09	1.4E-08	0.574	0.977
A11.627.624.249.Monocyte.Macrophage.Precursor.Cells	Blood or Immune	-2.9E-09	1.5E-08	0.579	0.977
A14.549.885.Tongue	Other	-3.3E-09	1.6E-08	0.584	0.977
A04.411.Lung	Other	-3.1E-09	1.5E-08	0.584	0.977
A15.378.316.Bone.Marrow.Cells	Blood or Immune	-3.8E-09	1.8E-08	0.586	0.977
A09.371.Eye	Other	-3.8E-09	1.6E-08	0.597	0.987
Adipose_Subcutaneous	Adipose	-3.7E-09	1.2E-08	0.618	0.993
A03.556.Gastrointestinal.Tract	Digestive	-4.9E-09	1.6E-08	0.619	0.993
A15.145.229.188.Blood.Platelets	Blood or Immune	-5.4E-09	1.7E-08	0.625	0.993
A11.872.Stem.Cells	Other	-5.5E-09	1.6E-08	0.635	0.993
A05.360.319.679.256.Cervix.Uteri	Other	-5.9E-09	1.5E-08	0.652	0.993
A03.556.249.249.356.668.Colon..Sigmoid	Digestive	-6.4E-09	1.5E-08	0.661	0.993
A11.627.635.Myeloid.Progenitor.Cells	Blood or Immune	-6.7E-09	1.6E-08	0.665	0.993
Pituitary	Endocrine	-6.2E-09	1.5E-08	0.666	0.993
A03.556.500.760.464.Parotid.Gland	Digestive	-7.3E-09	1.5E-08	0.681	0.993

A06.407.Endocrine.Glands	Endocrine	-6.7E-09	1.4E-08	0.689	0.993
A11.872.378.Hematopoietic.Stem.Cells	Blood or Immune	-7.6E-09	1.5E-08	0.690	0.993
A05.360.319.114.373.Fallopian.Tubes	Other	-7.8E-09	1.5E-08	0.693	0.993
A15.382.Immune.System	Blood or Immune	-8.8E-09	1.7E-08	0.697	0.993
Esophagus_Muscularis	Digestive	-6.8E-09	1.3E-08	0.698	0.993
A10.165.114.830.750.Subcutaneous.Fat	Adipose	-7.7E-09	1.5E-08	0.698	0.993
A15.378.316.580.Monocytes	Blood or Immune	-9.6E-09	1.8E-08	0.706	0.993
A11.329.372.600.Macrophages..Alveolar	Blood or Immune	-7.6E-09	1.4E-08	0.708	0.993
A15.382.490.555.567.537.Killer.Cells..Natural	Blood or Immune	-8.4E-09	1.5E-08	0.711	0.993
A14.724.557.Nasopharynx	Other	-9.0E-09	1.6E-08	0.714	0.993
A05.360.319.Genitalia..Female	Other	-8.3E-09	1.4E-08	0.719	0.993
A03.556.249.249.356.Colon	Digestive	-9.5E-09	1.6E-08	0.725	0.993
A11.872.653.Neural.Stem.Cells	CNS	-8.7E-09	1.4E-08	0.727	0.993
A15.382.812.522.Macrophages	Blood or Immune	-1.0E-08	1.6E-08	0.735	0.993
Kidney_Cortex	Other	-9.8E-09	1.5E-08	0.741	0.993
A11.872.190.260.Embryoid.Bodies	Other	-1.0E-08	1.6E-08	0.743	0.993
A11.118.637.555.567.569.T.Lymphocytes	Blood or Immune	-1.0E-08	1.6E-08	0.746	0.993
A15.145.Blood	Blood or Immune	-1.1E-08	1.7E-08	0.747	0.993
Prostate	Other	-1.0E-08	1.5E-08	0.748	0.993
A10.165.114.830.500.750.Subcutaneous.Fat..Abdominal	Adipose	-1.0E-08	1.5E-08	0.752	0.993
A07.231.114.Arteries	Cardiovascular	-1.0E-08	1.5E-08	0.753	0.993
A03.556.875.500.Esophagus	Digestive	-1.1E-08	1.6E-08	0.755	0.993
A06.407.312.Gonads	Endocrine	-1.0E-08	1.4E-08	0.768	0.993
A02.633.567.850.Quadriceps.Muscle	Musculoskeletal-connective	-1.2E-08	1.6E-08	0.778	0.993
A03.556.124.Intestines	Digestive	-1.3E-08	1.6E-08	0.782	0.993
A11.627.340.360.Granulocyte.Precursor.Cells	Blood or Immune	-1.3E-08	1.6E-08	0.788	0.993
A11.872.378.590.817.Megakaryocyte.Erythroid.Progenitor.Cells	Blood or Immune	-1.4E-08	1.8E-08	0.790	0.993
Adrenal_Gland	Endocrine	-1.1E-08	1.4E-08	0.795	0.993
A11.382.Endocrine.Cells	Endocrine	-1.2E-08	1.4E-08	0.800	0.993
Whole_Blood	Blood or Immune	-1.4E-08	1.6E-08	0.800	0.993
Skin_Sun_Exposed_(Lower_leg)	Other	-1.2E-08	1.4E-08	0.802	0.993
A06.407.071.140.Adrenal.Cortex	Endocrine	-1.2E-08	1.4E-08	0.805	0.993
Muscle_Skeletal	Musculoskeletal-connective	-1.2E-08	1.3E-08	0.822	0.993
A03.556.124.526.767.Rectum	Digestive	-1.6E-08	1.7E-08	0.825	0.993
Minor_Salivary_Gland	Other	-1.4E-08	1.5E-08	0.825	0.993
A08.186.211.730.317.357.Hypothalamus	CNS	-1.5E-08	1.5E-08	0.828	0.993
A05.360.Genitalia	Other	-1.4E-08	1.5E-08	0.831	0.993
A03.556.249.249.209.Cecum	Digestive	-1.4E-08	1.4E-08	0.838	0.993
A11.436.348.Hepatocytes	Liver	-1.7E-08	1.7E-08	0.840	0.993
A05.810.453.Kidney	Other	-1.5E-08	1.5E-08	0.843	0.993
Vagina	Other	-1.4E-08	1.4E-08	0.848	0.993
A03.556.875.Upper.Gastrointestinal.Tract	Digestive	-1.7E-08	1.7E-08	0.853	0.993
Bladder	Other	-1.4E-08	1.4E-08	0.854	0.993
A03.620.Liver	Liver	-1.7E-08	1.5E-08	0.867	0.993
A10.615.550.599.Mouth.Mucosa	Other	-1.7E-08	1.5E-08	0.867	0.993
Cervix_Endocervix	Other	-1.5E-08	1.4E-08	0.869	0.993
A05.360.319.114.630.Ovary	Other	-1.7E-08	1.4E-08	0.880	0.993
A11.329.114.Adipocytes	Adipose	-1.8E-08	1.5E-08	0.882	0.993
A14.549.Mouth	Other	-1.9E-08	1.5E-08	0.898	0.993
A05.360.444.492.362.Foreskin	Other	-1.8E-08	1.4E-08	0.900	0.993
A14.549.167.646.Periodontium	Other	-2.1E-08	1.6E-08	0.902	0.993
Fallopian_Tube	Other	-1.9E-08	1.4E-08	0.920	0.993
A05.360.319.679.Uterus	Other	-2.0E-08	1.4E-08	0.921	0.993
Skin_Not_Sun_Exposed_(Suprapubic)	Other	-2.2E-08	1.5E-08	0.932	0.993
A02.835.583.443.800.Synovial.Membrane	Musculoskeletal-connective	-1.9E-08	1.3E-08	0.933	0.993
A15.382.680.Phagocytes	Blood or Immune	-2.7E-08	1.7E-08	0.936	0.993
A15.382.812.260.Dendritic.Cells	Blood or Immune	-2.2E-08	1.5E-08	0.937	0.993
A15.145.300.Fetal.Blood	Blood or Immune	-3.0E-08	1.9E-08	0.941	0.993
A10.615.550.Mucous.Membrane	Other	-2.5E-08	1.6E-08	0.942	0.993
A10.272.497.Epidermis	Other	-2.5E-08	1.5E-08	0.947	0.993
A10.615.Membranes	Other	-2.6E-08	1.6E-08	0.948	0.993
Liver	Liver	-2.2E-08	1.3E-08	0.949	0.993
A05.360.319.679.490.Endometrium	Other	-2.3E-08	1.4E-08	0.951	0.993
A05.360.490.Germ.Cells	Other	-2.2E-08	1.3E-08	0.959	0.993
A11.329.Connective.Tissue.Cells	Musculoskeletal-connective	-2.5E-08	1.4E-08	0.964	0.993
A11.436.329.Granulosa.Cells	Endocrine	-2.3E-08	1.3E-08	0.964	0.993
A11.497.497.600.Oocytes	Other	-2.7E-08	1.2E-08	0.985	1.000
A11.436.397.Keratinocytes	Other	-3.3E-08	1.5E-08	0.988	1.000

A14.549.167.Dentition	Other	-4.1E-08	1.6E-08	0.996	1.000
A04.531.520.Nasal.Mucosa	Other	-4.4E-08	1.6E-08	0.997	1.000
A10.272.Epithelium	Other	-4.5E-08	1.6E-08	0.998	1.000
A06.407.312.782.Testis	Endocrine	-4.0E-08	1.2E-08	1.000	1.000

Tissue type groups correspond to the legend of Figure 1. FDR column contains the adjusted coefficient p-value using the Benjamini-Hochberg procedure
CNS, central nervous system; s.e. standard error