**Supplementary Information**

### **[Neuroinflammation and](https://www.sfari.org/funded-project/disrupted-homeostatic-synaptic-plasticity-in-autism-spectrum-disorders/) disrupted synaptic plasticity, the main pathological processes in multiple sclerosis and obsessive-compulsive disorder: an enrichment analysis**

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**Supplementary Tables**

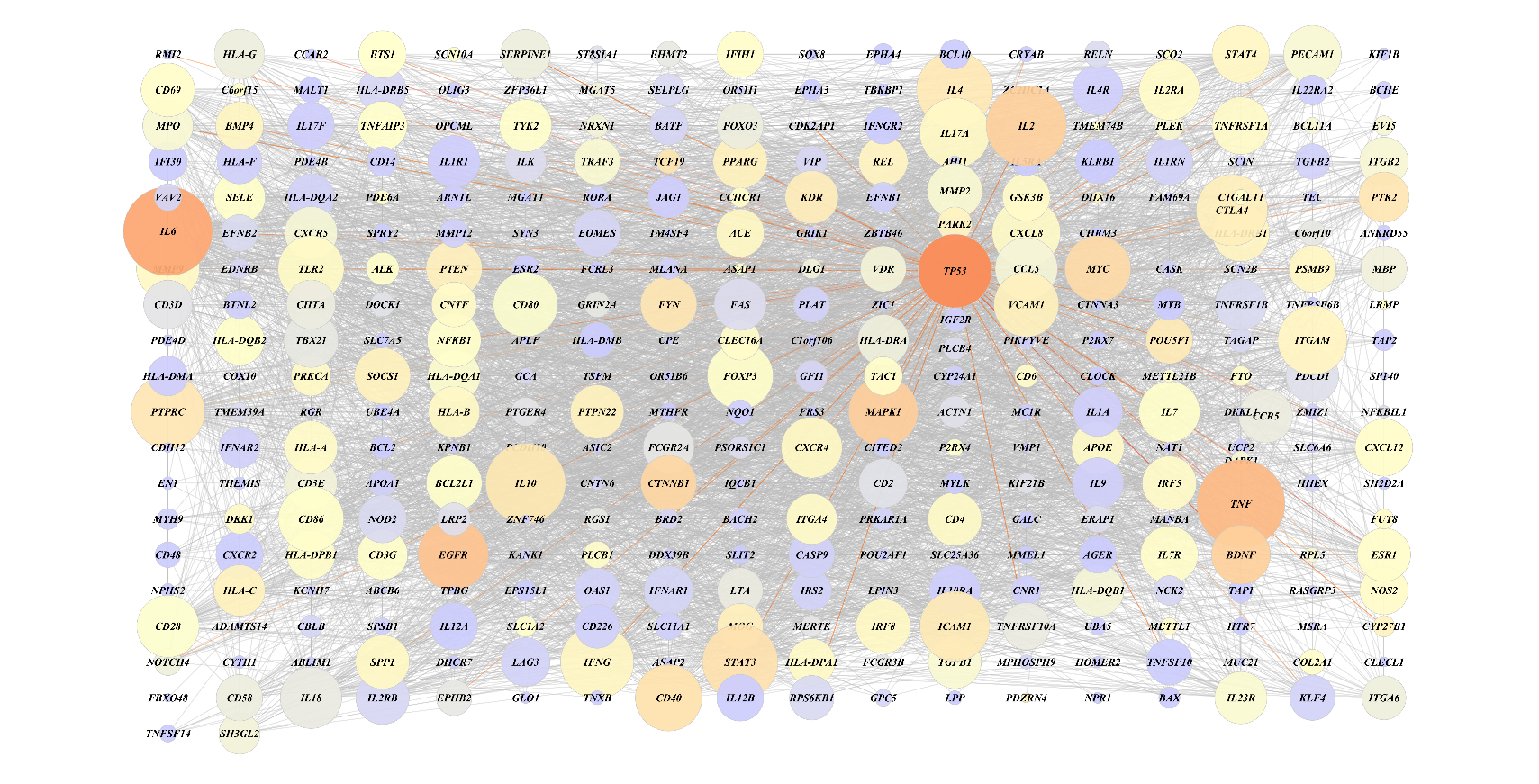
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| --- | --- | --- | --- |
| **Supplementary Table 1. Genes associated to MS** **base on literature review** | | | |
| **Index** | **Official Symbol** | **Official Full Name** | **Ensembl ID** |
|  | **ABCB6** | ATP-binding cassette sub-family B member 6 | ENSG00000115657 |
|  | **ABLIM1** | Actin-binding LIM protein 1 | ENSG00000099204 |
|  | **ACCN1** | Acid sensing ion channel subunit 2 | ENSG00000108684 |
|  | **ACE** | Angiotensin-converting enzyme | ENSG00000159640 |
|  | **ACTN1** | Alpha-actinin-1 | ENSG00000072110 |
|  | **ADAMTS14** | A disintegrin and metalloproteinase with thrombospondin motifs 14 | ENSG00000138316 |
|  | **AHI1** | Involved in vesicle trafficking and required for ciliogenesis | ENSG00000135541 |
|  | **ALK** | ALK tyrosine kinase receptor | ENSG00000171094 |
|  | **ANKRD15** | KN motif and ankyrin repeat domain-containing protein 1 | ENSG00000107104 |
|  | **ANKRD55** | Ankyrin repeat domain-containing protein 55 | ENSG00000164512 |
|  | **APOA1** | Apolipoprotein A-I | ENSG00000118137 |
|  | **APOE** | Apolipoprotein E | ENSG00000130203 |
|  | **ARNTL** | Aryl hydrocarbon receptor nuclear translocator-like protein 1 | ENSG00000133794 |
|  | **ASAP1** | Arf-GAP with SH3 domain | ENSG00000153317 |
|  | **BACH2** | Transcription regulator protein BACH2 | ENSG00000112182 |
|  | **BATF** | Basic leucine zipper transcriptional factor ATF-like | ENSG00000156127 |
|  | **bax** | Apoptosis regulator BAX | ENSG00000087088 |
|  | **BCHE** | Cholinesterase | ENSG00000114200 |
|  | [**BCL10**](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/bcl10) | B-cell lymphoma/leukemia 10 | ENSG00000142867 |
|  | **BCL11A** | B-cell lymphoma/leukemia 11A | ENSG00000119866 |
|  | **bcl2** | Apoptosis regulator Bcl-2 | ENSG00000171791 |
|  | **BCL2L1** | Bcl-2-like protein 1 | ENSG00000171552 |
|  | **BDNF** | Brain-derived neurotrophic factor | ENSG00000176697 |
|  | **BMP4** | Bone morphogenetic protein 4 | ENSG00000125378 |
|  | **BRD2** | Bromodomain-containing protein 2 | ENSG00000204256 |
|  | **BTNL2** | Butyrophilin-like protein 2 | ENSG00000204290 |
|  | **C16orf75** | RecQ-mediated genome instability protein 2 | ENSG00000175643 |
|  | **C1GALT1** | Glycoprotein-N-acetylgalactosamine 3-beta-galactosyltransferase 1 | ENSG00000106392 |
|  | **C1orf106** | Innate immunity activator protein | ENSG00000163362 |
|  | **C20orf46** | Transmembrane protein 74B | ENSG00000125895 |
|  | **C2orf13** | Aprataxin and PNK-like factor | ENSG00000169621 |
|  | **C6ORF10** | Uncharacterized protein C6orf10 | ENSG00000204296 |
|  | **C6orf15** | Uncharacterized protein C6orf15 | ENSG00000204542 |
|  | **CASK** | Peripheral plasma membrane protein CASK | ENSG00000147044 |
|  | **CASP-9** | Caspase-9 | ENSG00000132906 |
|  | **CBLB** | E3 ubiquitin-protein ligase CBL-B | ENSG00000114423 |
|  | **CCHCR1** | Coiled-coil alpha-helical rod protein 1 | ENSG00000204536 |
|  | **CCL5** | C-C motif chemokine 5 | ENSG00000271503 |
|  | **CCR5** | C-C chemokine receptor type 5 | ENSG00000160791 |
|  | **CD14** | Monocyte differentiation antigen CD14 | ENSG00000170458 |
|  | **CD2** | T-cell surface antigen CD2 | ENSG00000116824 |
|  | **CD226** | CD226 antigen | ENSG00000150637 |
|  | **CD25** | interleukin 2 receptor subunit alpha | ENSG00000134460 |
|  | **CD28** | T-cell-specific surface glycoprotein CD28 | ENSG00000178562 |
|  | **CD3D** | T-cell surface glycoprotein CD3 delta chain | ENSG00000167286 |
|  | **CD3E** | T-cell surface glycoprotein CD3 epsilon chain | ENSG00000198851 |
|  | **CD3G** | T-cell surface glycoprotein CD3 gamma chain | ENSG00000160654 |
|  | **CD4** | T-cell surface glycoprotein CD4 | ENSG00000010610 |
|  | **CD40** | Tumor necrosis factor receptor superfamily member 5 | ENSG00000101017 |
|  | **CD45 (PTPRC)** | Receptor-type tyrosine-protein phosphatase C | ENSG00000081237 |
|  | [**CD48**](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/cd48) | CD48 antigen | ENSG00000117091 |
|  | **CD58** | Lymphocyte function-associated antigen 3 | ENSG00000116815 |
|  | **CD6** | T-cell differentiation antigen CD6 | ENSG00000013725 |
|  | **CD69** | Early activation antigen CD69 | ENSG00000110848 |
|  | **CD80** | T-lymphocyte activation antigen CD80 | ENSG00000121594 |
|  | **CD86** | T-lymphocyte activation antigen CD86 | ENSG00000114013 |
|  | **CDH12** | Cadherin-12 | ENSG00000154162 |
|  | **CDK2AP1** | Cyclin-dependent kinase 2-associated protein 1 | ENSG00000111328 |
|  | **CHRM3** | Muscarinic acetylcholine receptor M3 | ENSG00000133019 |
|  | **CHST9** | Carbohydrate sulfotransferase 9 | ENSG00000154080 |
|  | **CIITA** | MHC class II transactivator | ENSG00000179583 |
|  | **CITED2** | Cbp/p300-interacting transactivator 2 | ENSP00000356623 |
|  | **CLEC16A** | Protein CLEC16A | ENSG00000038532 |
|  | **CLECL1** | C-type lectin-like domain family 1 | ENSG00000184293 |
|  | **CLOCK** | Circadian locomoter output cycles protein kaput | ENSG00000134852 |
|  | **CNR1** | Cannabinoid receptor 1 | ENSG00000118432 |
|  | **CNTF** | Ciliary neurotrophic factor | ENSG00000242689 |
|  | **CNTN6** | Contactin-6 | ENSG00000134115 |
|  | **COL2A1** | Collagen alpha-1(II) chain | ENSG00000139219 |
|  | **COX10** | Protoheme IX farnesyltransferase | ENSG00000006695 |
|  | **CPAMD8** | C3 and PZP like, alpha-2-macroglobulin domain containing 8 | ENSG00000160111 |
|  | **CPE** | Carboxypeptidase E | ENSG00000109472 |
|  | **CRYAB** | Alpha-crystallin B chain | ENSG00000109846 |
|  | **CSMD1** | CUB and sushi domain-containing protein 1 | ENSG00000183117 |
|  | [**CTLA4**](https://www.sciencedirect.com/topics/medicine-and-dentistry/ctla-4) | Cytotoxic T-lymphocyte protein 4 | ENSG00000163599 |
|  | **CTNNA3** | Catenin alpha-3 | ENSG00000183230 |
|  | **CTNNB1** | Catenin beta-1 | ENSG00000168036 |
|  | **CXCL12** | Stromal cell-derived factor 1 | ENSG00000107562 |
|  | **CXCR2** | C-X-C chemokine receptor type 2 | ENSG00000180871 |
|  | **CXCR4** | C-X-C chemokine receptor type 4 | ENSG00000121966 |
|  | **CXCR5** | C-X-C chemokine receptor type 5 | ENSG00000160683 |
|  | **CYP24A1** | 1,25-dihydroxyvitamin D(3) 24-hydroxylase, mitochondrial | ENSG00000019186 |
|  | **CYP27B1** | 25-hydroxyvitamin D-1 alpha hydroxylase | ENSG00000111012 |
|  | **DAPK1** | Death-associated protein kinase 1 | ENSG00000196730 |
|  | **DBC1** | Cell cycle and apoptosis regulator protein 2 | ENSG00000158941 |
|  | **DDEF2** | Arf-GAP with SH3 domain | ENSG00000151693 |
|  | **DDX39B** | Spliceosome RNA helicase DDX39B | ENSG00000198563 |
|  | **DHCR7** | 7-dehydrocholesterol reductase | ENSG00000172893 |
|  | **DHX16** | Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16 | ENSG00000204560 |
|  | **DKK1** | Dedicator of cytokinesis protein 1 | ENSG00000107984 |
|  | **DKKL1** | Dickkopf-like protein 1 | ENSG00000104901 |
|  | **DLEU1** | Leukemia-associated protein 1 | ENSG00000176124 |
|  | **DLG1** | Disks large homolog 1 | ENSG00000075711 |
|  | **DOCK1** | Dedicator of cytokinesis protein 1 | ENSG00000150760 |
|  | **EAAT2** | Excitatory amino acid transporter 2 | ENSG00000110436 |
|  | **EDNRB** | Endothelin receptor type B | ENSG00000136160 |
|  | **EFNB1** | Ephrin-B1 | ENSG00000090776 |
|  | **EFNB2** | Ephrin-B2 | ENSG00000125266 |
|  | **EGFR** | Epidermal growth factor receptor | ENSG00000146648 |
|  | **EHMT2** | Histone-lysine N-methyltransferase EHMT2 | ENSG00000204371 |
|  | **EN1** | Homeobox protein engrailed-1 | ENSG00000163064 |
|  | **EOMES** | Eomesodermin homolog | ENSG00000163508 |
|  | **EPHA3** | Ephrin type-A receptor 3 | ENSG00000044524 |
|  | **EPHA4** | Ephrin type-A receptor 4 | ENSG00000116106 |
|  | **EPHB2** | Ephrin type-B receptor 2 | ENSG00000133216 |
|  | **EPS15L1** | Epidermal growth factor receptor substrate 15-like 1 | ENSG00000127527 |
|  | **ERAP1** | Endoplasmic reticulum aminopeptidase 1 | ENSG00000164307 |
|  | **ESR1** | Estrogen receptor | ENSG00000091831 |
|  | **ESR2** | Estrogen receptor beta | ENSG00000140009 |
|  | **ETS1** | Protein C-ets-1 | ENSG00000134954 |
|  | **EVI5** | Ecotropic viral integration site 5 protein homolog | ENSG00000067208 |
|  | **FAM119B** | EEF1A lysine methyltransferase 3 | ENSG00000123427 |
|  | **FAM69** | Protein FAM69A | ENSG00000154511 |
|  | **FAS** | Tumor necrosis factor receptor superfamily member 6 | ENSG00000026103 |
|  | **FBXO48** | F-box protein 48 | ENSG00000204923 |
|  | **FCGR2A** | Low affinity immunoglobulin gamma Fc region receptor II-a | ENSG00000143226 |
|  | **FCGR3B** | Low affinity immunoglobulin gamma Fc region receptor III-B | ENSG00000162747 |
|  | **FCRL3** | Fc receptor-like protein 3 | ENSG00000160856 |
|  | **FOXO3A** | Forkhead box protein O3 | ENSG00000118689 |
|  | **FOXP3** | Forkhead box protein P3 | ENSG00000049768 |
|  | **FRS3** | Fibroblast growth factor receptor substrate 3 | ENSG00000137218 |
|  | **FTO** | Alpha-ketoglutarate-dependent dioxygenase FTO | ENSG00000140718 |
|  | **FUT8** | Alpha-(1,6)-fucosyltransferase | ENSG00000033170 |
|  | **FYN** | Tyrosine-protein kinase Fyn | ENSG00000010810 |
|  | **GALC** | Galactocerebrosidase | ENSG00000054983 |
|  | **GCA** | Grancalcin | ENSG00000115271 |
|  | **GFI1** | Zinc finger protein Gfi-1 | ENSG00000162676 |
|  | **GLO1** | Lactoylglutathione lyase | ENSG00000124767 |
|  | **GPC5** | Glypican-5 | ENSG00000179399 |
|  | **GRIK1** | Glutamate receptor ionotropic, kainate 1 | ENSG00000171189 |
|  | **GRIN2A** | Glutamate receptor ionotropic | ENSG00000183454 |
|  | **GSK3β** | Glycogen synthase kinase-3 beta | ENSG00000082701 |
|  | **HHEX** | Hematopoietically-expressed homeobox protein HHEX | ENSG00000152804 |
|  | **HLA-A** | HLA class I histocompatibility antigen, A-3 alpha chain | ENSG00000206503 |
|  | **HLA-B** | HLA class I histocompatibility antigen, B-7 alpha chain | ENSG00000234745 |
|  | **HLA‐C** | HLA class I histocompatibility antigen | ENSG00000204525 |
|  | **HLA-DMA** | HLA class II histocompatibility antigen | ENSG00000204257 |
|  | **HLA-DMB** | HLA class II histocompatibility antigen | ENSG00000242574 |
|  | **HLA-DPA1** | HLA class II histocompatibility antigen | ENSG00000231389 |
|  | **HLA-DPB1** | HLA class II histocompatibility antigen, DP beta 1 chain | ENSG00000223865 |
|  | **HLA-DQA1** | Major histocompatibility complex, class II, DQ alpha 1 | ENSG00000196735 |
|  | **HLA-DQA2** | HLA class II histocompatibility antigen, DQ alpha 2 chain | ENSG00000237541 |
|  | **HLA-DQB2** | Major histocompatibility complex, class II, DQ beta 2 | ENSG00000232629 |
|  | **HLA-DQβ** | HLA class II histocompatibility antigen, DQ beta 1 chain | ENSG00000179344 |
|  | **HLA-DRA** | HLA class II histocompatibility antigen, DR alpha chain | ENSG00000204287 |
|  | **HLA-DRB5** | HLA class II histocompatibility antigen | ENSG00000198502 |
|  | **HLA‐DRβ** | HLA class II histocompatibility antigen, DRB1-15 beta chain | ENSG00000196126 |
|  | **HLA-F** | HLA class I histocompatibility antigen | ENSG00000204642 |
|  | **HLA-G** | HLA class I histocompatibility antigen, alpha chain G | ENSG00000204632 |
|  | **HOMER2** | Homer protein homolog 2 | ENSG00000103942 |
|  | **HTR7** | 5-hydroxytryptamine receptor 7 | ENSG00000148680 |
|  | **ICAM‐1** | Intercellular adhesion molecule 1 | ENSG00000090339 |
|  | **IFI30** | Gamma-interferon-inducible lysosomal thiol reductase | ENSG00000216490 |
|  | **IFIH1** | Interferon-induced helicase C domain-containing protein 1 | ENSG00000115267 |
|  | **IFNAR1** | Interferon alpha/beta receptor 1 | ENSG00000142166 |
|  | **IFNAR2** | Interferon alpha/beta receptor 2 | ENSG00000159110 |
|  | **IFNG** | Interferon gamma | ENSG00000111537 |
|  | **IFNGR2** | Interferon gamma receptor 2 | ENSG00000159128 |
|  | **IGF2R** | Cation-independent mannose-6-phosphate receptor | ENSG00000197081 |
|  | **IL1** | Interleukin-1 alpha | ENSG00000115008 |
|  | **IL10** | Interleukin-10 | ENSG00000136634 |
|  | **IL10R1** | Interleukin-10 receptor subunit alpha | ENSG00000110324 |
|  | **IL-12** | Interleukin-12 subunit alpha | ENSG00000168811 |
|  | **IL12B** | Interleukin-12 subunit beta | ENSG00000113302 |
|  | **IL17** | Interleukin-17A | ENSG00000112115 |
|  | **IL17F** | Interleukin-17F | ENSG00000112116 |
|  | **IL18** | Interleukin-18 | ENSG00000150782 |
|  | **IL1R** | Interleukin-1 receptor type 1 | ENSG00000115594 |
|  | **IL1RA** | Interleukin-1 receptor antagonist protein | ENSG00000136689 |
|  | **IL2** | Interleukin-2 | ENSG00000109471 |
|  | **IL22RA2** | Interleukin-22 receptor subunit alpha-2 | ENSG00000164485 |
|  | **IL23R** | Interleukin-23 receptor | ENSG00000162594 |
|  | **IL2RB** | Interleukin-2 receptor subunit beta | ENSG00000100385 |
|  | **IL4** | Interleukin-4 | ENSG00000113520 |
|  | **IL4R** | Interleukin-4 receptor subunit alpha | ENSG00000077238 |
|  | **IL5RA** | Interleukin-5 receptor subunit alpha | ENSG00000091181 |
|  | **IL6** | Interleukin-6 | ENSG00000136244 |
|  | **IL7** | Interleukin-7 | ENSG00000104432 |
|  | **IL7RA** | Interleukin-7 receptor subunit alpha | ENSG00000168685 |
|  | **IL8** | Interleukin-8 | ENSG00000169429 |
|  | **IL9** | Interleukin-9 | ENSG00000145839 |
|  | **ILK** | Integrin-linked protein kinase | ENSG00000166333 |
|  | **IQCB1** | IQ calmodulin-binding motif-containing protein1 | ENSG00000173226 |
|  | **IRF5** | Interferon regulatory factor 5 | ENSG00000128604 |
|  | **IRF8** | Interferon regulatory factor 8 | ENSG00000140968 |
|  | **IRS2** | Insulin receptor substrate 2 | ENSG00000185950 |
|  | **ITGA4** | Integrin alpha-4 | ENSG00000115232 |
|  | **ITGA6** | Integrin alpha-6 | ENSG00000091409 |
|  | **ITGAM** | Integrin alpha-M | ENSG00000169896 |
|  | **ITGB2** | Integrin beta-2 | ENSG00000160255 |
|  | **JAG1** | Protein jagged-1 | ENSG00000101384 |
|  | **JRKL** | Jerky protein homolog-like | ENSG00000183340 |
|  | **KCNH7** | Potassium voltage-gated channel subfamily H member 7 | ENSG00000184611 |
|  | **KCNK5** | Potassium channel subfamily K member 5 | ENSG00000164626 |
|  | **KDR** | Vascular endothelial growth factor receptor 2 | ENSG00000128052 |
|  | **KIF1B** | Kinesin-like protein KIF1B | ENSG00000054523 |
|  | **KIF21B** | Kinesin-like protein KIF21B | ENSG00000116852 |
|  | **KLF4** | Krueppel-like factor 4 | ENSG00000136826 |
|  | **KLRB1** | Killer cell lectin-like receptor subfamily B member 1 | ENSG00000111796 |
|  | **KPNB1** | Importin subunit beta-1 | ENSG00000108424 |
|  | **LAG3** | Lymphocyte activation gene 3 protein | ENSG00000089692 |
|  | **LPIN3** | Phosphatidate phosphatase LPIN3 | ENSG00000132793 |
|  | **LPP** | Lipoma-preferred partner | ENSG00000145012 |
|  | **LRMP** | Lymphoid-restricted membrane protein | ENSG00000118308 |
|  | **LRP2** | Low-density lipoprotein receptor-related protein 2 | ENSG00000081479 |
|  | **MALT1** | - Mucosa-associated lymphoid tissue lymphoma translocation protein 1 | ENSG00000172175 |
|  | **MANBA** | Beta-mannosidase | ENSG00000109323 |
|  | **MAPK1** | Mitogen-activated protein kinase 1 | ENSG00000100030 |
|  | [**MBP**](https://www.genecards.org/cgi-bin/carddisp.pl?gene=MBP) | Myelin basic protein | ENSG00000197971 |
|  | **MC1R** | Melanocyte-stimulating hormone receptor | ENSG00000258839 |
|  | **MCTP2** | Multiple C2 and transmembrane domain-containing protein 2; | ENSG00000140563 |
|  | **ME3** | NADP-dependent malic enzyme | ENSG00000151376 |
|  | **MERTK** | Tyrosine-protein kinase Mer | ENSG00000153208 |
|  | **METTL1** | tRNA (guanine-N(7)-)-methyltransferase | ENSG00000037897 |
|  | **MGAT1** | Alpha-1,3-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase | ENSG00000131446 |
|  | **MGAT5** | Alpha-1,6-mannosylglycoprotein 6-beta-N-acetylglucosaminyltransferase A | ENSG00000152127 |
|  | **MIR1204** |  | ENSG00000283710 |
|  | **MIR1208** |  | ENSG00000221261 |
|  | **MLANA** | Melanoma antigen recognized by T-cells 1 | ENSG00000120215 |
|  | **MMEL1** | Membrane metallo-endopeptidase-like 1 | ENSG00000142606 |
|  | **MMP12** | Macrophage metalloelastase | ENSG00000262406 |
|  | **MMP2** | 72 kDa type IV collagenase | ENSG00000087245 |
|  | **MMP9** | Matrix metalloproteinase-9 | ENSG00000100985 |
|  | **MOG** | Myelin-oligodendrocyte glycoprotein | ENSG00000204655 |
|  | **MPHOSPH9** | M-phase phosphoprotein 9 | ENSG00000051825 |
|  | **MPO** | Myeloperoxidase | ENSG00000005381 |
|  | **MPV17L2** | Mpv17-like protein 2 | ENSG00000254858 |
|  | **MSRA** | Mitochondrial peptide methionine sulfoxide reductase | ENSG00000175806 |
|  | **MTHFR** | Methylenetetrahydrofolate reductase | ENSG00000177000 |
|  | **MUC21** | Mucin-21 | ENSG00000204544 |
|  | **MYB** | Transcriptional activator Myb | ENSG00000118513 |
|  | **MYC** | Myc proto-oncogene protein | ENSG00000136997 |
|  | **MYH9** | Myosin-9 | ENSG00000100345 |
|  | **MYLK** | Myosin light chain kinase | ENSG00000065534 |
|  | **NAT1** | Arylamine N-acetyltransferase 1 | ENSG00000171428 |
|  | **NCK2** | Cytoplasmic protein NCK2 | ENSG00000071051 |
|  | **NFKB1** | Nuclear factor NF-kappa-B p105 subunit | ENSG00000109320 |
|  | **NFKBIL1** | NF-kappa-B inhibitor-like protein 1 | ENSG00000204498 |
|  | **NOD2** | Nucleotide-binding oligomerization domain-containing protein 2 | ENSG00000167207 |
|  | **NOS2a** | Nitric oxide synthase, inducible | ENSG00000007171 |
|  | **NOTCH4** | Neurogenic locus notch homolog protein 4 | ENSG00000204301 |
|  | **NPHS2** | Podocin | ENSG00000116218 |
|  | **NPR1** | Atrial natriuretic peptide receptor 1 | ENSG00000169418 |
|  | **NQO1** | NAD(P)H dehydrogenase [quinone] 1 | ENSG00000181019 |
|  | **NRXN1** | Neurexin-1 | ENSG00000179915 |
|  | **OAS1** | 2'-5'-oligoadenylate synthase 1 | ENSG00000089127 |
|  | **OLIG3** | Oligodendrocyte transcription factor 3 | ENSG00000177468 |
|  | **OPCML** | Opioid-binding protein/cell adhesion molecule | ENSG00000183715 |
|  | **OPN** | Osteopontin; Binds tightly to hydroxyapatite | ENSG00000118785 |
|  | **OR51B6** | Olfactory receptor 51B6 | ENSG00000176239 |
|  | **OR51I1** | Olfactory receptor 51I1 | ENSG00000167359 |
|  | **OR51M1** | Olfactory receptor 51M1 | ENSG00000184698 |
|  | **P2RX4** | P2X purinoceptor 4 | ENSG00000135124 |
|  | **P2X7** | P2X purinoceptor 7 | ENSG00000089041 |
|  | **p53** | Cellular tumor antigen p53 | ENSG00000141510 |
|  | **PAI** | Plasminogen activator inhibitor 1 | ENSG00000106366 |
|  | **PARK2** | E3 ubiquitin-protein ligase parkin; | ENSG00000185345 |
|  | **PCDH10** | Protocadherin-10 | ENSG00000138650 |
|  | **PDCD1** | Programmed cell death protein 1 | ENSG00000188389 |
|  | **PDE4B** | cAMP-specific 3',5'-cyclic phosphodiesterase 4B | ENSG00000184588 |
|  | **PDE4D** | cAMP-specific 3',5'-cyclic phosphodiesterase 4D | ENSG00000113448 |
|  | **PDE6A** | Rod cGMP-specific 3',5'-cyclic phosphodiesterase subunit alpha | ENSG00000132915 |
|  | **PDZD8** | PDZ domain-containing protein 8 | ENSG00000165650 |
|  | **PDZRN4** | PDZ domain containing ring finger 4 | ENSG00000165966 |
|  | **PECAM1** | Platelet endothelial cell adhesion molecule | ENSG00000261371 |
|  | **PIP5K3** | 1-phosphatidylinositol 3-phosphate 5-kinase | ENSG00000115020 |
|  | **PITPNM2** | Membrane-associated phosphatidylinositol transfer protein 2 | ENSG00000090975 |
|  | **PLCβ1** | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-1 | ENSG00000182621 |
|  | **PLCβ4** | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-4 | ENSG00000101333 |
|  | **PLEK** | Pleckstrin | ENSG00000115956 |
|  | **POU2AF1** | POU domain class 2-associating factor 1 | ENSG00000110777 |
|  | **POU2F3** | POU domain, class 2, transcription factor 3 | ENSG00000137709 |
|  | **POU5F1** | POU domain, class 5, transcription factor 1 | ENSG00000204531 |
|  | **PPARγ** | Peroxisome proliferator-activated receptor gamma | ENSG00000132170 |
|  | **PPFIBP1** | Liprin-beta-1 | ENSG00000110841 |
|  | **PRKAR1A** | cAMP-dependent protein kinase type I-alpha regulatory subunit | ENSG00000108946 |
|  | **PRKCA** | Protein kinase C alpha type | ENSG00000154229 |
|  | **PSCD1** | Cytohesin-1 | ENSG00000108669 |
|  | **PSGL-1** | P-selectin glycoprotein ligand 1 | ENSG00000110876 |
|  | **PSMB9** | Proteasome subunit beta type-9 | ENSG00000240065 |
|  | **PSORS1C1** | Psoriasis susceptibility 1 candidate 1 | ENSG00000204540 |
|  | **PTEN** | Phosphatase and tensin homolog | ENSG00000171862 |
|  | **PTGER4** | Prostaglandin E2 receptor EP4 subtype | ENSG00000171522 |
|  | **PTK2** | Focal adhesion kinase 1 | ENSG00000169398 |
|  | **PTPN22** | Tyrosine-protein phosphatase non-receptor type 22 | ENSG00000134242 |
|  | **RAB38** | Ras-related protein Rab-38 | ENSG00000123892 |
|  | **RAGE** | Advanced glycosylation end product-specific receptor | ENSG00000204305 |
|  | **RASD2** | GTP-binding protein Rhes; | ENSG00000100302 |
|  | **RASGRP3** | Ras guanyl-releasing protein 3 | ENSG00000152689 |
|  | **RASSF8** | Ras association domain family member 8 | ENSG00000123094 |
|  | **REL** | Proto-oncogene c-Rel; | ENSG00000162924 |
|  | **RELN** | Reelin | ENSG00000189056 |
|  | **RGR** | RPE-retinal G protein-coupled receptor | ENSG00000148604 |
|  | **RGS1** | Regulator of G-protein signaling 1 | ENSG00000090104 |
|  | **RORA** | Nuclear receptor ROR-alpha | ENSG00000069667 |
|  | **RPL5** | 60S ribosomal protein L5 | ENSG00000122406 |
|  | **RPS6KB1** | Ribosomal protein S6 kinase beta-1 | ENSG00000108443 |
|  | **SCIN** | Adseverin | ENSG00000006747 |
|  | **SCN10A** | Sodium channel protein type 10 subunit alpha | ENSG00000185313 |
|  | **SCN2B** | Sodium channel subunit beta-2 | ENSG00000149575 |
|  | **SCO2** | Protein SCO2 homolog, mitochondrial | ENSG00000130489 |
|  | **SELE** | E-selectin; Cell-surface glycoprotein having a role in immunoadhesion | ENSG00000007908 |
|  | **SH2D2A** | SH2 domain-containing protein 2A | ENSG00000027869 |
|  | **SH3GL2** | Endophilin-A1 | ENSG00000107295 |
|  | **SLC11A1** | Natural resistance-associated macrophage protein 1 | ENSG00000018280 |
|  | **SLC25A36** | Solute carrier family 25 member 36 | ENSG00000114120 |
|  | **SLC6A6** | Sodium- and chloride-dependent taurine transporter | ENSG00000131389 |
|  | **SLC7A5** | Large neutral amino acids transporter small subunit 1 | ENSG00000103257 |
|  | **SLIT2** | Slit homolog 2 protein | ENSG00000145147 |
|  | **SOCS1** | Suppressor of cytokine signaling 1 | ENSG00000185338 |
|  | **SOX8** | Transcription factor SOX-8 | ENSG00000005513 |
|  | **SP140** | Nuclear body protein SP140 | ENSG00000079263 |
|  | **SPRY2** | Protein sprouty homolog 2 | ENSG00000136158 |
|  | **SPSB1** | SPRY domain-containing SOCS box protein 1 | ENSG00000171621 |
|  | **ST8SIA1** | Alpha-N-acetylneuraminide alpha-2,8-sialyltransferase | ENSG00000111728 |
|  | [**STAT3**](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/stat3) | Signal transducer and activator of transcription 3 | ENSG00000168610 |
|  | **STAT4** | Signal transducer and activator of transcription 4 | ENSG00000138378 |
|  | **SYN3** | Synapsin-3 | ENSG00000185666 |
|  | **TAC1** | Protachykinin-1 | ENSG00000006128 |
|  | **TAGAP** | T-cell activation Rho GTPase-activating protein | ENSG00000164691 |
|  | **TAP1** | Antigen peptide transporter 1 | ENSG00000168394 |
|  | **TAP2** | Antigen peptide transporter 2 | ENSG00000204267 |
|  | **TBKBP1** | TANK-binding kinase 1-binding protein 1 | ENSG00000198933 |
|  | **TBX21** | T-box transcription factor TBX21 | ENSG00000073861 |
|  | **TCF19** | Transcription factor 19 | ENSG00000137310 |
|  | [**TEC**](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/tec-gene) | Tyrosine-protein kinase Tec | ENSG00000135605 |
|  | **TGF-β** | Transforming growth factor beta-1 | ENSG00000105329 |
|  | **TGF-β2** | Transforming growth factor beta-2 | ENSG00000092969 |
|  | **THEMIS** | Protein THEMIS | ENSG00000172673 |
|  | **TIMMDC1** | Complex I assembly factor TIMMDC1 | ENSG00000113845 |
|  | **TLR2** | Toll-like receptor 2 | ENSG00000137462 |
|  | **TM4SF4** | Transmembrane 4 L6 family member 4 | ENSG00000169903 |
|  | **TMEM39A** | Transmembrane protein 39A | ENSG00000176142 |
|  | **TNFA** | Tumor necrosis factor | ENSG00000232810 |
|  | **TNFAIP3** | Tumor necrosis factor alpha-induced protein 3 | ENSG00000118503 |
|  | **TNFR2** | Tumor necrosis factor receptor superfamily member 1B | ENSG00000028137 |
|  | **TNFRSF10A** | Tumor necrosis factor receptor superfamily member 10A | ENSG00000104689 |
|  | **TNFRSF1A** | Tumor necrosis factor receptor superfamily member 1A | ENSG00000067182 |
|  | **TNFRSF6B** | Tumor necrosis factor receptor superfamily | ENSG00000243509 |
|  | **TNFSF14** | Tumor necrosis factor ligand superfamily member 14 | ENSG00000125735 |
|  | **TNFβ** | Lymphotoxin-alpha | ENSG00000226979 |
|  | **TNXB** | Tenascin-X | ENSG00000168477 |
|  | **TPA** | Tissue-type plasminogen activator | ENSG00000104368 |
|  | **TPBG** | Trophoblast glycoprotein | ENSG00000146242 |
|  | [**TRAF3**](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/traf3) | TNF receptor-associated factor 3 | ENSG00000131323 |
|  | **TRAIL** | Tumor necrosis factor ligand superfamily member 10 | ENSG00000121858 |
|  | **TSFM** | Elongation factor Ts, mitochondrial | ENSG00000123297 |
|  | **TYK2** | Non-receptor tyrosine-protein kinase TYK2 | ENSG00000105397 |
|  | **UBE1DC1** | Ubiquitin-like modifier-activating enzyme 5 | ENSG00000081307 |
|  | **UBE4A** | Ubiquitin conjugation factor E4 A | ENSG00000110344 |
|  | **UCP2** | Mitochondrial uncoupling protein 2 | ENSG00000175567 |
|  | **VAV2** | Guanine nucleotide exchange factor VAV2 | ENSG00000160293 |
|  | **VCAM1** | Vascular cell adhesion protein 1 | ENSG00000162692 |
|  | **VDR** | Vitamin D3 receptor | ENSG00000111424 |
|  | **VIP** | VIP peptides | ENSG00000146469 |
|  | **VMP1** | Vacuole membrane protein 1 | ENSG00000062716 |
|  | **ZBTB46** | Zinc finger and BTB domain-containing protein 46 | ENSG00000130584 |
|  | **ZC2HC1A** | Zinc finger C2HC-type containing 1A | ENSG00000104427 |
|  | **ZFP36L1** | mRNA decay activator protein ZFP36L1 | ENSG00000185650 |
|  | **ZIC1** | Zinc finger protein ZIC 1 | ENSG00000152977 |
|  | **ZMIZ1** | Zinc finger MIZ domain-containing protein 1 | ENSG00000108175 |
|  | **ZNF433** | Zinc finger protein 433 | ENSG00000197647 |
|  | **ZNF746** | Zinc finger protein 746 | ENSG00000181220 |

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| **Supplementary Table 2. Genes associated to OCD base on literature review** | | | |
| **Index** | **Official Symbol** | **Official Full Name** | **Ensembl ID** |
|  | **5HT2C** | 5-hydroxytryptamine receptor 2C | ENSG00000147246 |
|  | **ADCY8** | Adenylate cyclase type 8 | ENSG00000155897 |
|  | **ANKK1** | Ankyrin repeat and kinase domain containing 1 | ENSG00000170209 |
|  | **AQP2** | Aquaporin-2 | ENSG00000167580 |
|  | **AR** | Androgen receptor | ENSG00000169083 |
|  | **ARHGAP6** | Rho GTPase-activating protein 6 | ENSG00000047648 |
|  | **ARX** | Homeobox protein ARX | ENSG00000004848 |
|  | **BCOR** | BCL-6 corepressor | ENSG00000183337 |
|  | **BDKRB2** | B2 bradykinin receptor | ENSG00000168398 |
|  | **BDNF** | Brain-derived neurotrophic factor | ENSG00000176697 |
|  | **BTBD3** | BTB/POZ domain-containing protein 3 | ENSG00000132640 |
|  | **C16orf88** | Lysine rich nucleolar protein 1 | ENSG00000103550 |
|  | **CCKBR** | Gastrin/cholecystokinin type B receptor | ENSG00000110148 |
|  | **CDH10** | Cadherin-10 | ENSG00000040731 |
|  | **CDH2** | Cadherin-2 | ENSG00000170558 |
|  | **CDH9** | Cadherin-9 | ENSG00000113100 |
|  | **CHCHD2** | Coiled-coil-helix-coiled-coil-helix domain-containing protein 2 | ENSG00000106153 |
|  | **CHRNA10** | Neuronal acetylcholine receptor subunit alpha-10 | ENSG00000129749 |
|  | **CLCN5** | H(+)/Cl(-) exchange transporter 5 | ENSG00000171365 |
|  | **CNR1** | Cannabinoid receptor 1 | ENSG00000118432 |
|  | **CNTNAP2** | Contactin-associated protein-like 2 | ENSG00000174469 |
|  | **COL27A1** | Collagen alpha-1(XXVII) chain | ENSG00000196739 |
|  | **COMT** | Catechol O-methyltransferase | ENSG00000093010 |
|  | **CTTNBP2** | Cortactin-binding protein 2 | ENSG00000077063 |
|  | **CYP2C19** | Cytochrome P450 2C19 | ENSG00000165841 |
|  | **CYP2D6** | Cytochrome P450 2D6 | ENSG00000100197 |
|  | **CYP2E1** | Cytochrome P450 2E1 | ENSG00000130649 |
|  | **DACH1** | Dachshund homolog 1 | ENSG00000276644 |
|  | **DLG4** | Disks large homolog 4 | ENSG00000132535 |
|  | **DLGAP1** | Disks large-associated protein 1 | ENSG00000170579 |
|  | **DNM3** | Dynamin-3 | ENSG00000197959 |
|  | **DRD1** | D(1A) dopamine receptor | ENSG00000184845 |
|  | **DRD2** | D(2) dopamine receptor | ENSG00000149295 |
|  | **DRD3** | D(3) dopamine receptor | ENSG00000151577 |
|  | **DRD4** | Dopamine receptor D4 | ENSG00000069696 |
|  | **DUSP9** | Dual specificity protein phosphatase 9 | ENSG00000130829 |
|  | **EAAT3** | Excitatory amino acid transporter 3 | ENSG00000106688 |
|  | **EFNB1** | Ephrin-B1 | ENSG00000090776 |
|  | **ESR1** | Estrogen receptor | ENSG00000091831 |
|  | **ESR2** | Estrogen receptor beta | ENSG00000140009 |
|  | **FAIM2** | Protein lifeguard 2 | ENSG00000135472 |
|  | **FGF13** | Fibroblast growth factor 13 | ENSG00000129682 |
|  | **FKBP5** | Peptidyl-prolyl cis-trans isomerase FKBP5 | ENSG00000096060 |
|  | **FOS** | Proto-oncogene c-Fos | ENSG00000170345 |
|  | **FOXD4** | Forkhead box D4 | ENSG00000170122 |
|  | **FUT2** | Galactoside 2-alpha-L-fucosyltransferase 2 | ENSG00000176920 |
|  | **G6PD** | Glucose-6-phosphate 1-dehydrogenase | ENSG00000160211 |
|  | **GABBR1** | Gamma-aminobutyric acid type B receptor subunit 1 | ENSG00000204681 |
|  | **GABRG2** | Gamma-aminobutyric acid receptor subunit gamma-2 | ENSG00000113327 |
|  | **GAD1** | Glutamate decarboxylase 1 | ENSG00000128683 |
|  | **GAD2** | Glutamate decarboxylase 2 | ENSG00000136750 |
|  | **GPC6** | Glypican-6 | ENSG00000183098 |
|  | **GRIA2** | Glutamate receptor 2 | ENSG00000120251 |
|  | **GRIA4** | Glutamate receptor 4 | ENSG00000152578 |
|  | **GRIK2** | Glutamate receptor ionotropic | ENSG00000164418 |
|  | **GRIK3** | Glutamate receptor ionotropic | ENSG00000163873 |
|  | **GRIN2B** | Glutamate receptor ionotropic | ENSG00000273079 |
|  | **HACE1** | E3 ubiquitin-protein ligase HACE1 | ENSG00000085382 |
|  | **HCN4** | Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 4; | ENSG00000138622 |
|  | **HLA-DRB1** | HLA class II histocompatibility antigen, DRB1-15 beta chain | ENSG00000196126 |
|  | **HTR1A** | 5-hydroxytryptamine receptor 1A | ENSG00000178394 |
|  | **HTR1B** | 5-hydroxytryptamine receptor 1B | ENSG00000135312 |
|  | **HTR1D** | 5-hydroxytryptamine receptor 1D | ENSG00000179546 |
|  | **HTR2A** | 5-hydroxytryptamine receptor 2A | ENSG00000102468 |
|  | **HTR2B** | 5-hydroxytryptamine receptor 2B | ENSG00000135914 |
|  | **HTR3A** | 5-hydroxytryptamine receptor 3A | ENSG00000166736 |
|  | **HTR3B** | 5-hydroxytryptamine receptor 3B | ENSG00000149305 |
|  | **HTR3C** | 5-hydroxytryptamine receptor 3C | ENSG00000178084 |
|  | **HTR3D** | 5-hydroxytryptamine receptor 3D | ENSG00000186090 |
|  | **HTR3E** | 5-hydroxytryptamine receptor 3E | ENSG00000186038 |
|  | **IKBKG** | NF-kappa-B essential modulator | ENSG00000269335 |
|  | **IMMP2L** | Mitochondrial inner membrane protease subunit 2 | ENSG00000184903 |
|  | **IQCK** | IQ motif containing K | ENSG00000174628 |
|  | **ISM1** | Isthmin-1 | ENSG00000101230 |
|  | **KCNH5** | Potassium voltage-gated channel subfamily H member 5 | ENSG00000140015 |
|  | **KCNK10** | Potassium channel subfamily K member 10 | ENSG00000100433 |
|  | **LMX1A** | LIM homeobox transcription factor 1-alpha | ENSG00000162761 |
|  | **LONRF3** | LON peptidase N-terminal domain and ring finger 3 | ENSG00000175556 |
|  | **MAOA** | Amine oxidase A | ENSG00000189221 |
|  | **MAOB** | Amine oxidase | ENSG00000069535 |
|  | **MEIS2** | Homeobox protein Meis2 | ENSG00000134138 |
|  | **MID1IP1** | Mid1-interacting protein 1 | ENSG00000165175 |
|  | **MNDA** | Myeloid cell nuclear differentiation antigen | ENSG00000163563 |
|  | **MOG** | Myelin-oligodendrocyte glycoprotein | ENSG00000204655 |
|  | **mTOR** | Serine/threonine-protein kinase mTOR | ENSG00000198793 |
|  | **MZT1** | Mitotic-spindle organizing protein 1 | ENSG00000204899 |
|  | **NEUROD6** | Neurogenic differentiation factor 6 | ENSG00000164600 |
|  | **NFKBIL1** | NF-kappa-B inhibitor-like protein 1 | ENSG00000204498 |
|  | **NHS** | Nance-Horan syndrome protein | ENSG00000188158 |
|  | **NHSL2** | NHS-like protein 2 | ENSG00000204131 |
|  | **nNOS** | Nitric oxide synthase | ENSG00000089250 |
|  | **NOS1AP** | Carboxyl-terminal PDZ ligand of neuronal nitric oxide synthase protein | ENSG00000198929 |
|  | **NPSR1** | Neuropeptide S receptor | ENSG00000187258 |
|  | **NRCAM** | Neuronal cell adhesion molecule | ENSG00000091129 |
|  | **NRXN1** | Neurexin-1 | ENSG00000179915 |
|  | **NRXN3** | Neurexin-3 | ENSG00000021645 |
|  | **NTRK1** | High affinity nerve growth factor receptor | ENSG00000198400 |
|  | **NTRK2** | BDNF/NT-3 growth factors receptor | ENSG00000148053 |
|  | **NTRK3** | NT-3 growth factor receptor | ENSG00000140538 |
|  | **OFCC1** | Orofacial cleft 1 candidate 1 | ENSG00000181355 |
|  | **OLIG2** | Oligodendrocyte transcription factor 2 | ENSG00000205927 |
|  | **OPRM1** | Mu-type opioid receptor | ENSG00000112038 |
|  | **OXTR** | Oxytocin receptor | ENSG00000180914 |
|  | **PBX1** | Pre-B-cell leukemia transcription factor 1 | ENSG00000185630 |
|  | **PCDH10** | Protocadherin-10 | ENSG00000138650 |
|  | **PKM** | Pyruvate kinase PKM | ENSG00000067225 |
|  | **PQBP1** | Polyglutamine-binding protein 1 | ENSG00000102103 |
|  | **PTPRD** | Receptor-type tyrosine-protein phosphatase delta | ENSG00000153707 |
|  | **REEP3** | Receptor expression-enhancing protein 3 | ENSG00000165476 |
|  | **RGS4** | Regulator of G-protein signaling 4 | ENSG00000117152 |
|  | **RORB** | Nuclear receptor ROR-beta | ENSG00000198963 |
|  | **RYR3** | Ryanodine receptor 3 | ENSG00000198838 |
|  | **SAPAP3** | Disks large-associated protein 3 | ENSG00000116544 |
|  | **SGCE** | Epsilon-sarcoglycan | ENSG00000127990 |
|  | **SLC18A1** | Chromaffin granule amine transporter | ENSG00000036565 |
|  | **SLC1A2** | Excitatory amino acid transporter 2 | ENSG00000110436 |
|  | **SLC22A3** | Solute carrier family 22 member 3 | ENSG00000146477 |
|  | **SLC6A3** | Sodium-dependent dopamine transporter | ENSG00000142319 |
|  | **SLC6A4** | Sodium-dependent serotonin transporter | ENSG00000108576 |
|  | **SLITRK1** | SLIT and NTRK-like protein 1 | ENSG00000178235 |
|  | **SLITRK3** | SLIT and NTRK-like protein 3 | ENSG00000121871 |
|  | **SLITRK5** | SLIT and NTRK-like protein 5 | ENSG00000165300 |
|  | **SV2A** | Synaptic vesicle glycoprotein 2A | ENSG00000159164 |
|  | **TIMM17B** | Translocase of inner mitochondrial membrane 17B | ENSG00000126768 |
|  | **TNFA** | Tumor necrosis factor | ENSG00000232810 |
|  | **TPH1** | Tryptophan hydroxylase 1 | ENSG00000129167 |
|  | **TPH2** | Tryptophan hydroxylase 2 | ENSG00000139287 |
|  | **TSC22D3** | TSC22 domain family protein 3 | ENSG00000157514 |
|  | **UCP2** | Mitochondrial uncoupling protein 2 | ENSG00000175567 |
|  | **ZNF75D** | Zinc finger protein 75D | ENSG00000186376 |

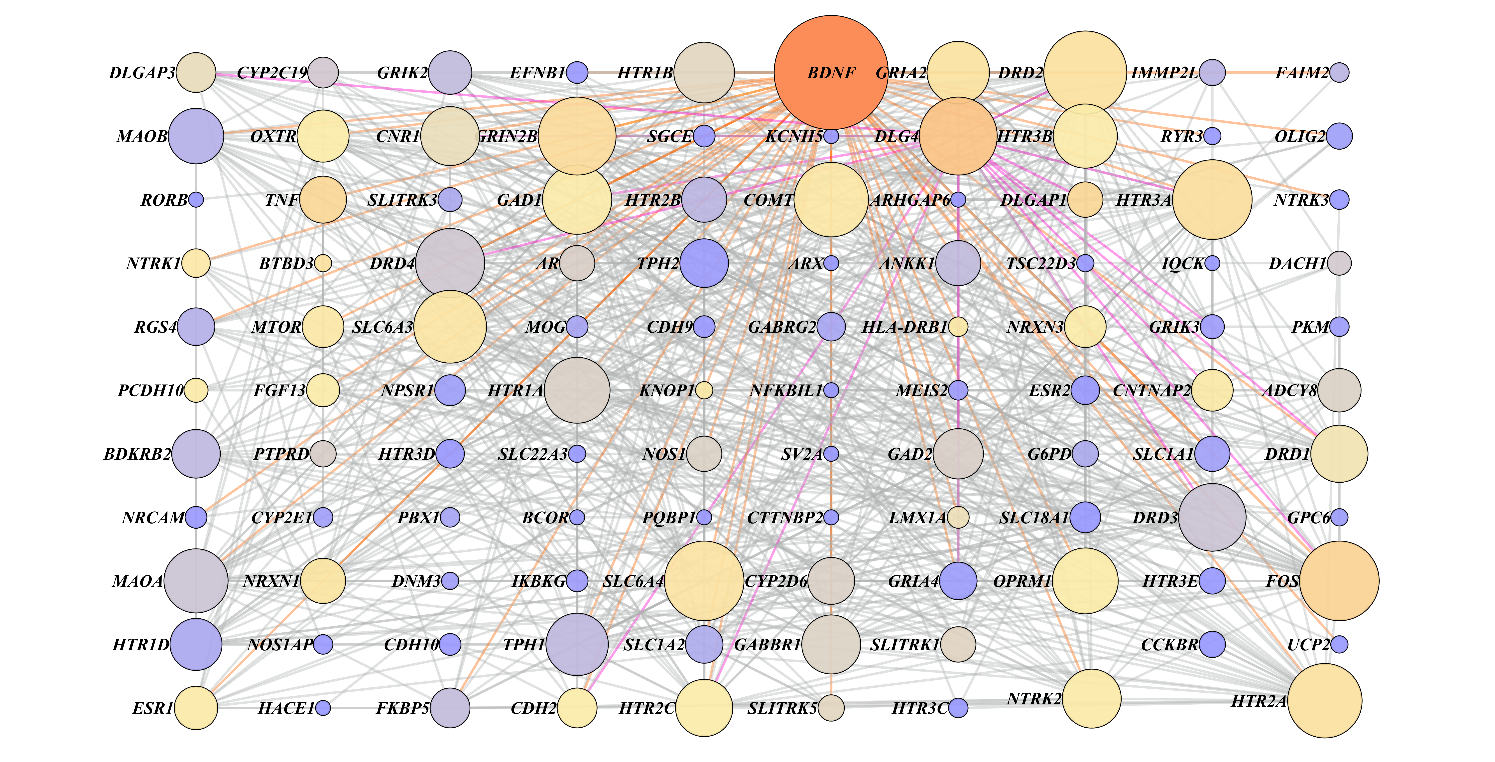
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| **Supplementary Table 3. Biological processes enrichment analysis results for genes related to MS** | |
| **Biological processes enrichment analysis** | **false discovery rate** |
| cell surface receptor signaling pathway | 4.24E-59 |
| immune system process | 3.54E-54 |
| regulation of immune system process | 3.54E-54 |
| positive regulation of immune system process | 2.67E-52 |
| signaling | 2.25E-50 |
| cell communication | 4.04E-50 |
| response to organic substance | 7.98E-49 |
| signal transduction | 8.72E-49 |
| response to cytokine | 4.36E-48 |
| cytokine-mediated signaling pathway | 1.04E-47 |
| regulation of response to stimulus | 9.29E-47 |
| cellular response to organic substance | 5.68E-45 |
| positive regulation of response to stimulus | 1.45E-44 |
| cellular response to cytokine stimulus | 1.45E-44 |
| positive regulation of multicellular organismal process | 2.45E-44 |
| cellular response to stimulus | 2.45E-44 |
| immune response | 3.91E-44 |
| regulation of multicellular organismal process | 1.97E-43 |
| regulation of immune response | 1.04E-42 |
| cellular response to chemical stimulus | 2.18E-42 |
| response to stimulus | 8.57E-39 |
| regulation of cell-cell adhesion | 2.65E-38 |
| positive regulation of biological process | 5.11E-38 |
| response to chemical | 1.70E-37 |
| regulation of cell adhesion | 7.22E-37 |
| regulation of cell activation | 3.00E-35 |
| regulation of leukocyte cell-cell adhesion | 3.00E-35 |
| positive regulation of cellular process | 3.13E-34 |
| positive regulation of immune response | 4.49E-34 |
| regulation of cytokine production | 8.05E-34 |
| regulation of leukocyte activation | 1.72E-33 |
| defense response | 1.21E-32 |
| regulation of lymphocyte activation | 1.56E-32 |
| response to external stimulus | 4.01E-32 |
| regulation of cell population proliferation | 5.32E-32 |
| positive regulation of cell activation | 2.45E-31 |
| positive regulation of developmental process | 2.58E-31 |
| response to oxygen-containing compound | 3.02E-31 |
| positive regulation of cell-cell adhesion | 3.94E-31 |
| regulation of multicellular organismal development | 3.94E-31 |
| positive regulation of leukocyte activation | 4.76E-31 |
| regulation of response to stress | 4.93E-31 |
| positive regulation of leukocyte cell-cell adhesion | 7.86E-31 |
| positive regulation of cytokine production | 1.82E-30 |
| regulation of cell death | 1.93E-30 |
| positive regulation of cell adhesion | 2.27E-30 |
| regulation of T cell activation | 7.06E-30 |
| response to stress | 7.52E-30 |
| regulation of apoptotic process | 1.34E-29 |
| response to molecule of bacterial origin | 5.27E-29 |
| multi-organism process | 6.63E-29 |
| positive regulation of lymphocyte activation | 1.06E-28 |
| regulation of developmental process | 1.76E-28 |
| response to lipid | 5.82E-28 |
| regulation of cellular process | 1.70E-27 |
| positive regulation of T cell activation | 1.89E-27 |
| response to biotic stimulus | 1.25E-26 |
| positive regulation of cellular metabolic process | 2.60E-26 |
| response to other organism | 3.34E-26 |
| regulation of defense response | 4.44E-26 |
| positive regulation of metabolic process | 6.42E-26 |
| regulation of cell communication | 8.25E-26 |
| regulation of response to external stimulus | 9.42E-26 |
| regulation of signal transduction | 1.15E-25 |
| positive regulation of cell differentiation | 1.49E-25 |
| response to lipopolysaccharide | 1.63E-25 |
| regulation of signaling | 2.15E-25 |
| regulation of leukocyte proliferation | 4.83E-25 |
| regulation of biological process | 6.32E-25 |
| negative regulation of biological process | 7.72E-25 |
| positive regulation of nitrogen compound metabolic process | 8.29E-25 |
| regulation of lymphocyte proliferation | 1.27E-24 |
| cell activation | 1.47E-24 |
| negative regulation of response to stimulus | 2.10E-24 |
| positive regulation of cell population proliferation | 2.43E-24 |
| regulation of cell differentiation | 7.24E-24 |
| negative regulation of cellular process | 1.33E-23 |
| positive regulation of macromolecule metabolic process | 1.69E-23 |
| response to bacterium | 1.74E-23 |
| negative regulation of apoptotic process | 1.74E-23 |
| leukocyte activation | 1.50E-22 |
| lymphocyte activation | 1.55E-22 |
| positive regulation of signal transduction | 1.99E-22 |
| negative regulation of cell death | 2.19E-22 |
| positive regulation of cell communication | 3.59E-22 |
| biological regulation | 4.50E-22 |
| positive regulation of signaling | 4.73E-22 |
| cellular response to oxygen-containing compound | 7.52E-22 |
| regulation of T cell proliferation | 1.39E-21 |

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| **Supplementary Table 4. Biological processes enrichment analysis results for genes related to OCD** | |
| **Biological processes enrichment analysis** | **false discovery rate** |
| trans-synaptic signaling | 5.39E-19 |
| regulation of neurotransmitter levels | 4.96E-17 |
| chemical synaptic transmission | 3.00E-16 |
| learning or memory | 9.73E-16 |
| cell-cell signaling | 5.19E-15 |
| regulation of biological quality | 5.19E-15 |
| response to drug | 4.50E-14 |
| response to cocaine | 6.61E-14 |
| ion transport | 1.95E-13 |
| serotonin receptor signaling pathway | 3.10E-13 |
| cell communication | 4.41E-13 |
| system process | 7.47E-13 |
| signaling | 1.83E-12 |
| ion transmembrane transport | 2.97E-12 |
| transmembrane transport | 6.22E-12 |
| response to alkaloid | 8.45E-12 |
| response to ammonium ion | 4.69E-11 |
| response to xenobiotic stimulus | 5.58E-11 |
| response to stimulus | 5.58E-11 |
| cation transmembrane transport | 5.58E-11 |
| cation transport | 9.12E-11 |
| regulation of membrane potential | 9.33E-11 |
| response to organic cyclic compound | 1.03E-10 |
| response to chemical | 2.15E-10 |
| response to oxygen-containing compound | 2.70E-10 |
| nervous system development | 2.86E-10 |
| regulation of multicellular organismal process | 2.97E-10 |
| multi-organism behavior | 3.10E-10 |
| regulation of neurotransmitter transport | 4.07E-10 |
| regulation of ion transport | 4.52E-10 |
| social behavior | 5.75E-10 |
| response to toxic substance | 7.97E-10 |
| regulation of synapse organization | 8.52E-10 |
| phenol-containing compound metabolic process | 1.28E-09 |
| response to ethanol | 1.28E-09 |
| learning | 1.59E-09 |
| adult behavior | 1.59E-09 |
| cellular calcium ion homeostasis | 1.73E-09 |
| memory | 1.85E-09 |
| regulation of synaptic transmission, glutamatergic | 2.54E-09 |
| regulation of nervous system development | 2.76E-09 |
| neurotransmitter metabolic process | 3.05E-09 |
| dopamine metabolic process | 3.69E-09 |
| nervous system process | 3.69E-09 |
| positive regulation of synapse assembly | 3.88E-09 |
| system development | 4.22E-09 |
| modulation of chemical synaptic transmission | 4.26E-09 |
| brain development | 4.82E-09 |

**Supplementary Figures**

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**Supplementary Figure 1.** **This genetic network represents interactions between genes related to MS.** This network is consisted of 363 nodes and 4401 edges. The larger nodes indicate a higher degree and more connections while more orange means greater betweenness centrality.

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**Supplementary Figure 2. This genetic network represents interactions between genes related to OCD.** This network is consisted of 130 nodes and 661 edges. The larger nodes indicate a higher degree and more connections while more orange means greater betweenness centrality.