Supplemental Materials

In Silico Analysis Reveals Overlapping Molecular Mechanisms Between COVID-19 and Attention-Deficit/Hyperactivity Disorder

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Supplementary Tables 1-4

Supplementry Table 1. List of genes for each enrichment term in GO Molecular Function pathways.

Enrichment terms	List of genes
Growth factor activity	*AMH, HGF, IL2, IL5, REG1A, PSPN, FGF2, EGF, CSF2, AGT, NGF, IGF1, IL6, IL10, BDNF*
Hormone activity	*SCT, AMH, GAST, PMCH, AGT, AVP, IGF1, INS, POMC, ADIPOQ, PTH, ADM, HAMP*
Growth factor receptor binding	*IL2, IL5, PSPN, IL1RN, IL1A, IL1B, FGF2, EGF, APP, CSF2, IL6, IL10*
1-phosphatidylinositol-3-kinase activity	*PIK3CA, ATM, PIK3CD, PIK3CG, PIK3CB*
Monooxygenase activity	*CYP4F3, CYP27B1, CYP2B6, DBH, TBXAS1, PAH, NOS1, CYP2D6, CYP3A4*
1-phosphatidylinositol-4-phosphate 3-kinase activity	*PIK3CA, PIK3CD, PIK3CG, PIK3CB*
Phosphatidylinositol-4,5-bisphosphate 3-kinase activity	*PIK3CA, PIK3CD, PIK3CG, PIK3CB*
Copper ion binding	*IL1A, SOD1, ALB, MT-CO2, DBH, HAMP, SNCA*
Phosphatidylinositol-3,4-bisphosphate 5-kinase activity	*PIK3CA, PIK3CD, PIK3CG, PIK3CB*
Anandamide 8,9 epoxidase activity	*CYP2B6, CYP2D6, CYP3A4*
Anandamide 11,12 epoxidase activity	*CYP2B6, CYP2D6, CYP3A4*
Antioxidant activity	*CAT, APOE, SOD1, ALB, TPO, HP, TXN*
Anandamide 14,15 epoxidase activity	*CYP2B6, CYP2D6, CYP3A4*
Oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen, NAD(P)H as one donor, and incorporation of one atom of oxygen	*CYP27B1, CYP2B6, NOS1, CYP2D6, CYP3A4*
Death receptor binding	*CASP3, NGF, EDA, BDNF*
Tau protein binding	*STUB1, APOE, S100B, GSK3B, SNCA*
Low-density lipoprotein particle receptor binding	*APOE, CRP, APP, HSPG2*
Insulin receptor substrate binding	*PIK3CA, INSRR, PIK3CB*
Neurotrophin receptor binding	*NGF, BDNF, NTRK1*
Death receptor agonist activity	*NGF, EDA*

Supplementry Table 2. List of genes for each enrichment term in GO Cellular Component pathways.

Enrichment terms	List of genes
Secretory granule lumen	*MAPK1, HGF, NFKB1, CAT, CFP, EGF, APP, ALB, SERPINF2, FN1, HP, IGF1, DBH, INS, POMC, SERPINA1, PPIA*
Axon	*SNAP25, NRP1, SOD1, SLC6A3, APP, BCR, USP9X, GSK3B, SCN8A, COMT, CNTNAP2, DMD, INSRR, CNR1, NGF, OPRM1, DDC, GABRG2, BDNF, NTRK1, ADORA2A, SLC6A1, PRKCB, SNCA*
Endoplasmic reticulum lumen	*MAPK1, STS, PROC, CFP, APOE, HRC, BCHE, MFGE8, APP, ALB, FN1, COL18A1, COL11A2, INS, IL6, SERPINA1*
Platelet alpha granule lumen	*HGF, EGF, APP, ALB, SERPINF2, FN1, IGF1, SERPINA1*
Membrane raft	*MAPK1, SLC6A3, APP, CASP3, F2R, ADCY2, DMD, CNR1, ADRA1A, OPRM1, PTPRC, SLC2A1, NOS1, HK1, FAS*
Phosphatidylinositol 3-kinase complex, class IA	*PIK3CA, PIK3CD, PIK3CG, PIK3CB*
Blood microparticle	*PON1, APOE, BCHE, ALB, SERPINF2, FN1, HP, AGT, SLC2A1*
Synaptic membrane	*CLTA, SNAP25, NRP1, SLC6A3, F2R, HTR3A, DMD, CNR1, SRPX2, ADRA1A, NLGN1, OPRM1, GABRG2, ADORA2A, SLC6A1*
Integral component of postsynaptic membrane	*NRP1, SLC6A3, ADRA1A, NLGN1, OPRM1, GABRG2, ADORA2A, SLC6A1*
Integral component of synaptic membrane	*NRP1, SLC6A3, CNR1, ADRA1A, NLGN1, OPRM1, GABRG2, ADORA2A, SLC6A1*
Organelle envelope lumen	*CAT, HTRA2, BCHE, SOD1, APP, PANK2, COA7*
Postsynaptic membrane	*NRP1, SLC6A3, F2R, HTR3A, DMD, ADRA1A, NLGN1, OPRM1, GABRG2, ADORA2A, SLC6A1*
Integral component of presynaptic membrane	*SLC6A3, CNR1, ADRA1A, OPRM1, ADORA2A, SLC6A1*
Presynaptic membrane	*CLTA, SNAP25, SLC6A3, CNR1, ADRA1A, OPRM1, ADORA2A, SLC6A1*
Exocytic vesicle	*CLTA, SNAP25, APP, DMD, NGF, IGF1, DDC, BDNF, RAB40B, SNCA*

Synaptic vesicle	*CLTA, SNAP25, APP, DMD, NGF, DDC, BDNF, RAB40B, SNCA*
Phosphatidylinositol 3-kinase complex, class IB	*PIK3CA, PIK3CG*
GABA-ergic synapse	*CNR1, ADRA1A, NLGN1, GABRG2, SLC6A1*
Caveola	*MAPK1, SLC6A3, F2R, ADRA1A, SLC2A1*
Cytoplasmic side of membrane	*EEF1A2, SNAP25, KRAS, HTRA2, GNAS, PTEN, PTPRC, AKT1*

Supplementry Table 3. List of genes for each enrichment term in GO Biological Processe pathways.

Enrichment terms	List of genes
Dopamine catabolic process	*SLC6A3, MAOA, COMT, MAOB, DBH*
Regulation of calcidiol 1-monooxygenase activity	*NFKB1, CYP27B1, IFNG, IL1B*
Alkaloid metabolic process	*BCHE, DDC, CYP2D6, CYP3A4*
Maintenance of blood vessel diameter homeostasis by renin-angiotensin	*SERPINF2, AGT, AGTR2*
Brain renin-angiotensin system	*TACR1, AGT, AGTR2*
G protein-coupled receptor signaling pathway coupled to cGMP nucleotide second messenger	*AGT, AGTR2*
Superior temporal gyrus development	*GSK3B, CNTNAP2*
Regulation of Golgi lumen acidification	*SLC9A7, UBE3A*
Fever generation	*IL1A, IL1B*
Angiotensin-mediated drinking behavior	*TACR1, AGT*
Alkaloid catabolic process	*CYP2D6, CYP3A4*
Negative regulation of calcidiol 1-monooxygenase activity	*NFKB1, CYP27B1*
Isoquinoline alkaloid metabolic process	*DDC, CYP2D6*
Natural killer cell chemotaxis	*PIK3CD, PIK3CG*
Negative regulation of serotonin uptake	*NOS1, SNCA*
Positive regulation of calcidiol 1-monooxygenase activity	*IFNG, IL1B*
Trans-synaptic signaling by endocannabinoid, modulating synaptic transmission	*F2R, CNR1*
Positive regulation of plasma cell differentiation	*IL2, IL10*
Response to melanocyte-stimulating hormone	*MC4R, POMC*
Regulation of hydrogen peroxide catabolic process	*HP, SNCA*

Supplementry Table 4. List of genes for each enrichment term in KEGG pathway.

Enrichment terms	List of genes
EGFR tyrosine kinase inhibitor resistance	*MAPK1, HGF, KRAS, PIK3CA, FGF2, EGF, ERBB2, GSK3B, EIF4EBP1, PTEN, PIK3CD, IGF1, IL6, AKT1, PRKCB, PIK3CB*
Prostate cancer	*MAPK1, NFKB1, KRAS, PIK3CA, EGF, ERBB2, KLK3, GSK3B, INSRR, PTEN, PIK3CD, IGF1, INS, AKT1, IKBKG, PIK3CB*
HIF-1 signaling pathway	*MAPK1, NFKB1, IFNG, PIK3CA, EGF, ERBB2, EIF4EBP1, PIK3CD, IGF1, INS, IL6, SLC2A1, AKT1, HK1, PRKCB, PIK3CB*
T cell receptor signaling pathway	*MAPK1, NFKB1, IL2, IFNG, IL5, KRAS, PIK3CA, CSF2, GSK3B, PIK3CD, PTPRC, IL10, AKT1, IKBKG, PIK3CB*
Acute myeloid leukemia	*MAPK1, NFKB1, RARA, KRAS, PIK3CA, CSF2, EIF4EBP1, PIK3CD, AKT1, IKBKG, PIK3CB*
Central carbon metabolism in cancer	*MAPK1, KRAS, PIK3CA, ERBB2, PTEN, PIK3CD, SLC2A1, NTRK1, AKT1, HK1, PIK3CB*
Pancreatic cancer	*MAPK1, NFKB1, KRAS, PIK3CA, EGF, ERBB2, PIK3CD, BRCA2, AKT1, IKBKG, PIK3CB*
Aldosterone-regulated sodium reabsorption	*MAPK1, KRAS, PIK3CA, NR3C2, PIK3CD, IGF1, INS, PRKCB, PIK3CB*
Melanoma	*MAPK1, HGF, KRAS, PIK3CA, FGF2, EGF, PTEN, PIK3CD, IGF1, AKT1, PIK3CB*
Endometrial cancer	*MAPK1, KRAS, PIK3CA, EGF, ERBB2, GSK3B, PTEN, PIK3CD, AKT1, PIK3CB*
Longevity regulating pathway – multiple species	*CAT, KRAS, PIK3CA, SOD1, ADCY2, PIK3CD, IGF1, INS, AKT1, PIK3CB*
Allograft rejection	*IL2, IFNG, IL5, CD40, IL10, LOC102723407, FAS*
African trypanosomiasis	*IFNG, IL1B, IL6, IL10, LOC102723407, PRKCB, FAS*
Type II diabetes mellitus	*MAPK1, PIK3CA, PIK3CD, INS, ADIPOQ, HK1, PIK3CB*
Malaria	*HGF, IFNG, IL1B, GYPA, CD40, IL6, IL10*
Tyrosine metabolism	*TPO, MAOA, COMT, MAOB, DBH, DDC*
Graft-versus-host disease	*IL2, IFNG, IL1A, IL1B, IL6, FAS*
Type I diabetes mellitus	*IL2, IFNG, IL1A, IL1B, INS, FAS*
Asthma	*IL5, CCL11, CD40, IL10, LOC102723407*
Phenylalanine metabolism	*MAOA, MAOB, DDC, PAH*