Appendix

Tables 1 and 2 summarize the main results obtained from the GO enrichment on underexpressed and overexpressed genes, respectively. GO terms relating to a similar biological process have been grouped together, indicating the name of the genes involved in each process. As often similar GO terms share genes, duplicated genes have been removed.

Table 1 Underexpressed Genes

Biological Processes	GOBPID terms	n° genes	Genes included[a]
Cell surface receptors pathways	GO:0007166	29	ACTR2, LILRB1, CYLD, ATP6V0E2, EFNB2, CCNY, PEG10, NPB, ADGRD1, TMEM145, IFNGR1, ITGB8, KRAS, NCK1, PDPK1, PRKACB, BIRC6, CEACAM1, RGS18, BMP2, TIAM1, CA2, CPEB4, DYRK2, CBL, KAT2B, ACVR1B, USP34, P2RY14
Negative regulation of cell cycle, proliferation & apoptosis	GO:0051726, GO:0008285, GO:0097190	23	TMOD3, FABP7, LILRB1,TOM1L1, CD33, PRPF40A, DYRK2, NCK1, PRKACB, CYLD, EFNB2, PDPK1, NACC2, ARL6IP5, BIRC6, RBL2, CCNY, TIAM1, SF1, KAT2B, CTBP1, ACVR1B , BMP2
Immune response & Cell Adhesion	GO:0045088, GO:0051249, GO:0002684, GO:0006955, GO:1903037, GO:0034110	15	PDPK1, CYLD, SUSD4, TLR5, CA2, ACTR2, SPPL2A, LST1, HAMP, LILRB1, PRKACB, IFNGR1, ACVR1B, SASH3, NCK
Regulation of hydrolase activity	GO:0051336	14	ARL6IP5, CST3, ITSN2, ASAP1, PDPK1, SERPINB6, PRKACB, BIRC6, ARHGAP9, RGS18, BMP2, WNK1, TIAM1, DENND1C
RNA processing	GO:0006396	9	SRRM1, PAPD4, DHX36, HNRNPA2B1, PRPF40A, RP9, SF1, SLBP, SCAF11
Axon Guidance	GO:0007411	7	ACTR2, EFNB2, KIF5C, KRAS, NCK1, TIAM1, ZIC2
Negative regulation of protein transport	GO:0051224	5	LYPLA1, LILRB1, CYLD, RHBDF2, DYRK2
Activation of protein kinase activity	GO:0032147	5	TOM1L1, KRAS, PDPK1, PRKACB, BMP2

[a] Genes can overlap between Biological processes.

Table 2 Overexpressed Genes

Biological Processes	GOBPID terms	nº genes	Genes included[a]
Metabolic Processes	GO:1903050 GO:0042180 GO:0045862 GO:0034655 GO:0005996 GO:0006066 GO:0044265 GO:0043085, GO:0043170	82	RPP30, ASB1, RTCB, ZNF397, NRBP1, U2AF1, PIGC, CYR61, FUCA1, CFH, FBXW7, PCMTD1, PSMD4, CCL5, MAN1B1, PRMT1, MYDGF, COL12A1, SEC31A, PSMC1, DRG1, RPL27A, ATG10, ZNF554, PSMD3, APOL2, TRAPPC2, GSTP1, CYR61, PMVK, WDR46, FUCA1, CCNB1IP1, BAX, DIS3, STX12, ZNF426, APOL3, SLC35D2, PTGER3, SLC35B4, CTNNB1, RETSAT, RPS9, POLR3GL, RGS4, FBXW7, SAMD4B, NPY1R, EIF6, USP7, USP7 , INPPL1, TRIP6, PPAP2A, SEC31A, LIG4, POLR3C, ZCCHC11, ATF5, MFAP4, TOB2, OGT, PDE10A,TIMM17A, OSR2, ZBTB26, CCS, ZNF791, PIN1, NUDT4, CTSD, DPH5, COPS6, CCL8, RPE65, SNF8, ZNF496, MAN1B1, OBFC1, APOBEC3F, RPA2
Cell structure organization	GO:0043062, GO:0044419, GO:0051234, GO:0051640	54	APOL2, NUDT4, CALU, SLC39A7, CCL8, COL12A1, USP7, EIF6, TMED9, ECM2, BAX, CYR61, ABI3BP, ATG10, CCS, APOL3, SEC31A, ANTXR2, TRAPPC2, CCL5, TRIP6, HNMT, SLC35B4, INPPL1, TIMM17A, TMEM63A, NRBP1, COPS6, PSMC1, SNF8, FBXW7, HOMER3, MCOLN2, STX12, PTGER3, SYTL5, PSMD3, SNCAIP, PSMD4, RPL27A, CTNNB1, CTSD, RPS9, PEX16, RIMS4, WDR46, U2AF1, SLC26A7, ARF5, LIG4, SLC35D2, MFAP4, APOBEC3F
Transport and Homeostasis	GO:0006887, GO:0016482, GO:0006816, GO:0072511, GO:0060249, GO:0051650, GO:0044765	40	SLC35B4, TMEM63A, U2AF1, HOMER3, SLC39A7, MCOLN2, WDR46, OBFC1, SLC26A7, CCS , TMED9, EIF6, COPA, NRBP1, TIMM17A, APOL2, CALU, SYTL5, NUDT4, SLC35D2, SNCAIP, SNF8, SEC31A, RPL27A, BAX, SYTL5 TIMM17A, STX12, RPS9, CCL5, APOL3, HNMT, CTNNB1, CCL8, TRAPPC2, TRIP6, RPA2, RPE65, RIMS4, PEX16, PTGER3
DNA & Protein Modification	GO:1903322, GO:0032259, GO:0031400, GO:0006605, GO:0032446, GO:0051338	30	ATG10, SNF8, RPS9, BAX, TIMM17A, PRMT1, PIN1, OGT, PSMD4, FBXW7, PSMC1, HNMT, RPL27A, DPH5, CYR61, GSTP1, PCMTD1, PSMD3, CTNNB1, ASB1, PEX16, SEC31A, PIN1, RGS4, MYDGF, TRIP6, HOMER3, CCL5 , WDR46, CCNB1IP1
Immune Response & Inflamation	GO:0002478, GO:0019882, GO:0016032, GO:0001817, GO:0006954	27	CFH, PSMD3, GSTP1, FBXW7, RPS9, COPS6, PSMC1, POLR3GL, APOL2, ASB1, SNF8, APOBEC3F, PSMD4, CTSD, BAX, ZCCHC11, RPL27A, POLR3C, LIG4, PTGER3, APOL3, USP7, PIN1, SEC31A, CTNNB1, CCL8, CCL5
Negative regulation of apoptosis & cell death	GO:0030111, GO:0060548, GO:0043066	13	MYDGF, CYR61, WIF1, CCL5, PSMC1, ATF5, BAX, PSMD3, CTNNB1, GSTP1, PSMD4, LIG4, ATF5

[a] Genes can overlap between Biological processes.