

Supplementary Materials

Legends for Supplementary Figures

Figure S1 OVOL2 is highly expressed in most tumors.

Compared with normal tissue, expression level of OVOL2 was significantly higher in breast tumor. Compared with Her2⁺ and Luminal subtype, expression level of OVOL2 was lower in basal breast tumor. The statistical significance computed by the Wilcoxon test is annotated by the number of stars (*: p-value < 0.05; **: p-value <0.01; ***: p-value <0.001).

Figure S2 OVOL2 was significantly lower in basal/TNBC subtype.

Expression level of OVOL2 was significantly lower in basal-like (A), TNBC (B) and basal-like & TNBC (C) subtype based on RNA-seq of bc-GenExMiner v4.8 database. (Figures were automatically generated from the database. The ‘*’ represents the values of samples. p-value < 0.0001)

Figure S3 OVOL2 was correlated with various immune cells infiltration.

Expression of OVOL2 was significantly negatively correlated with infiltration of non-regulatory CD4⁺ T cell (A), naïve CD4⁺ T cell (B, C), Neutrophil (D, E), Macrophage M2 (F,G), Myeloid dendritic cell (H), Cancer associated fibroblast (I), Endothelial cell (J, K, L), NK T cell (M) and Monocyte (N), while positively correlated with infiltration of Eosinophil (O) and MDSC (P).

OVOL2 Expression Level (log2 TPM)

Figure S1

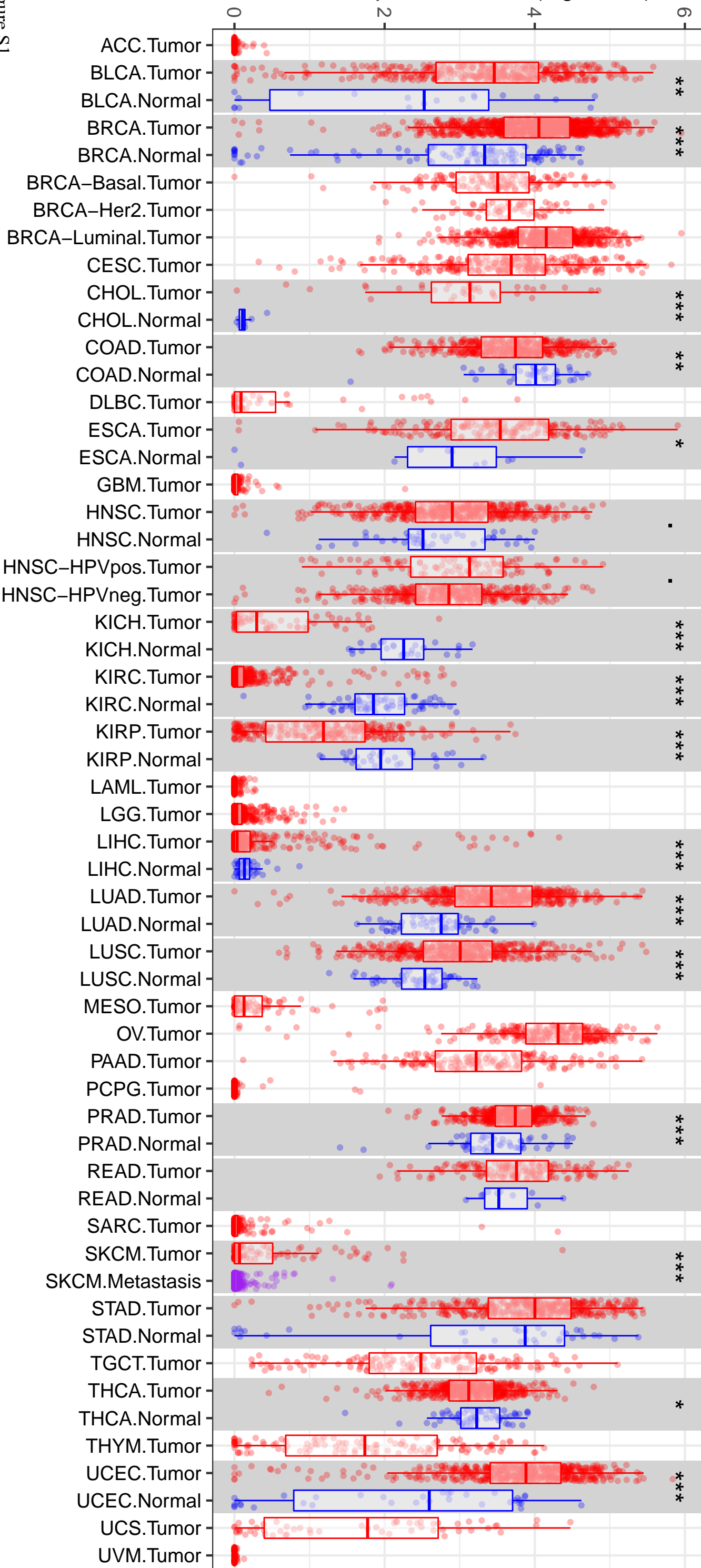
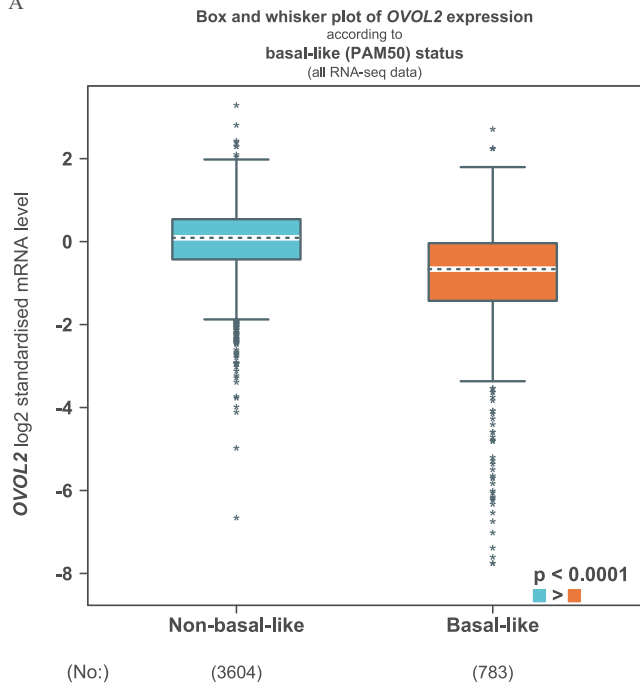
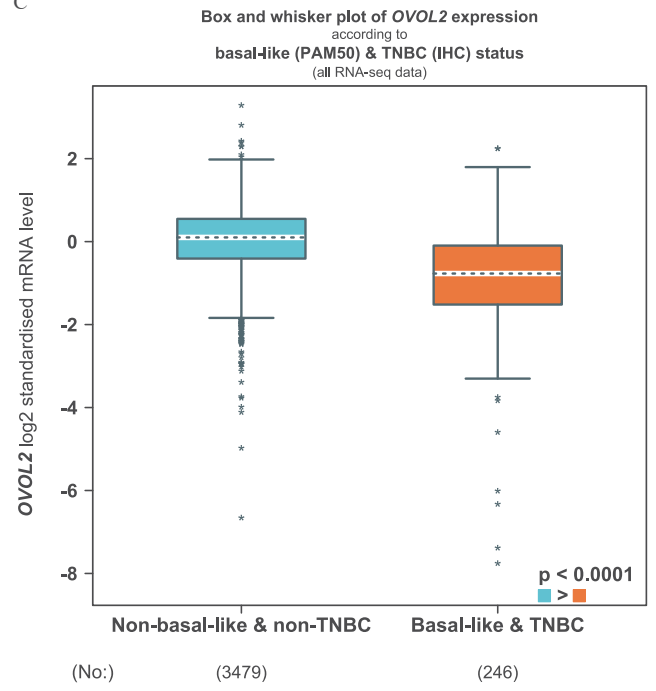


Figure S2

A



C



B

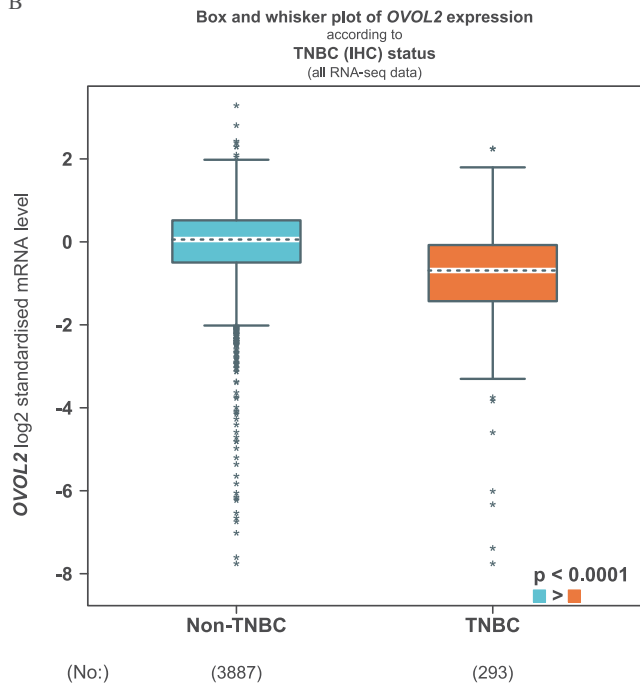
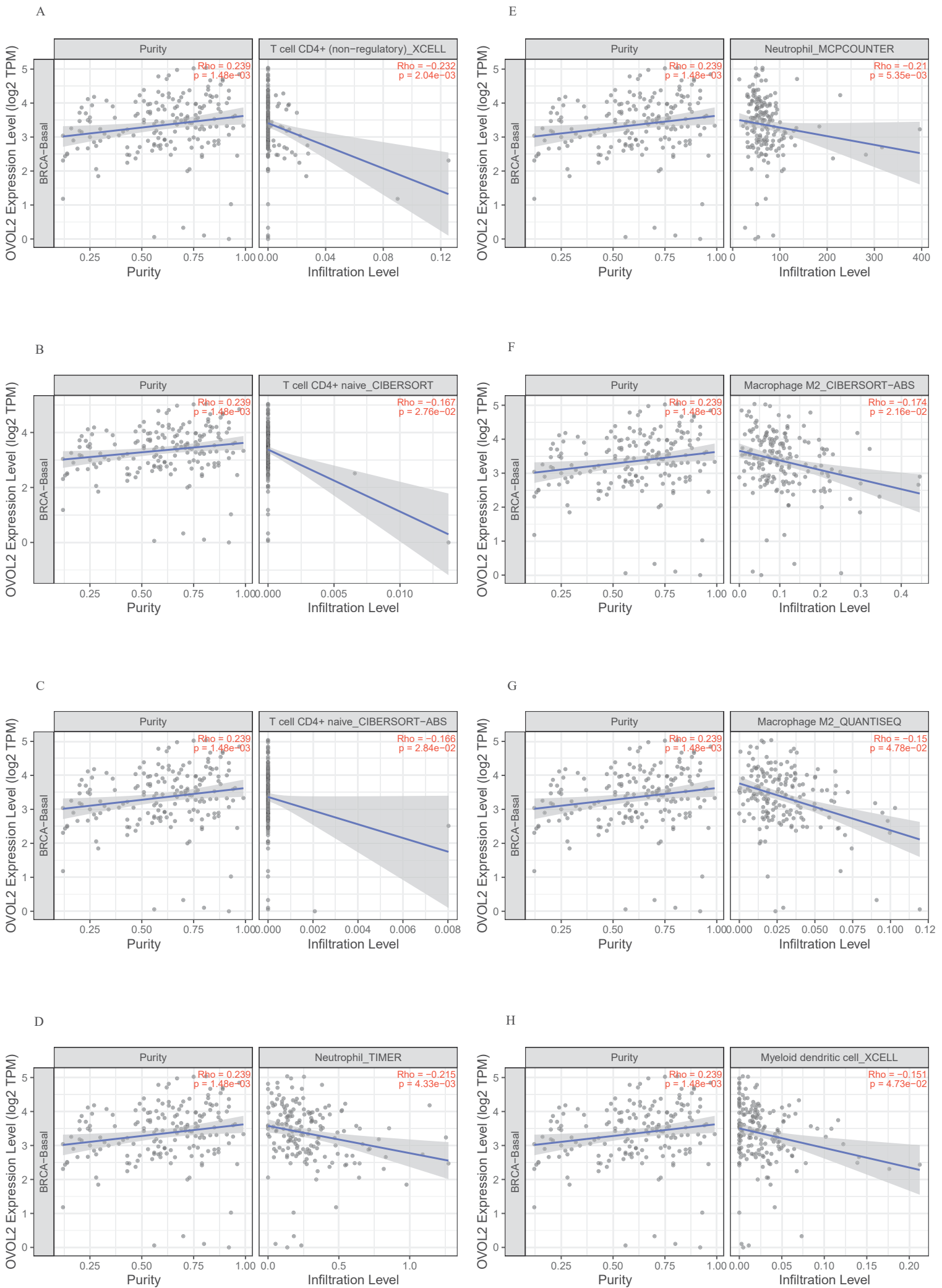


Figure S3



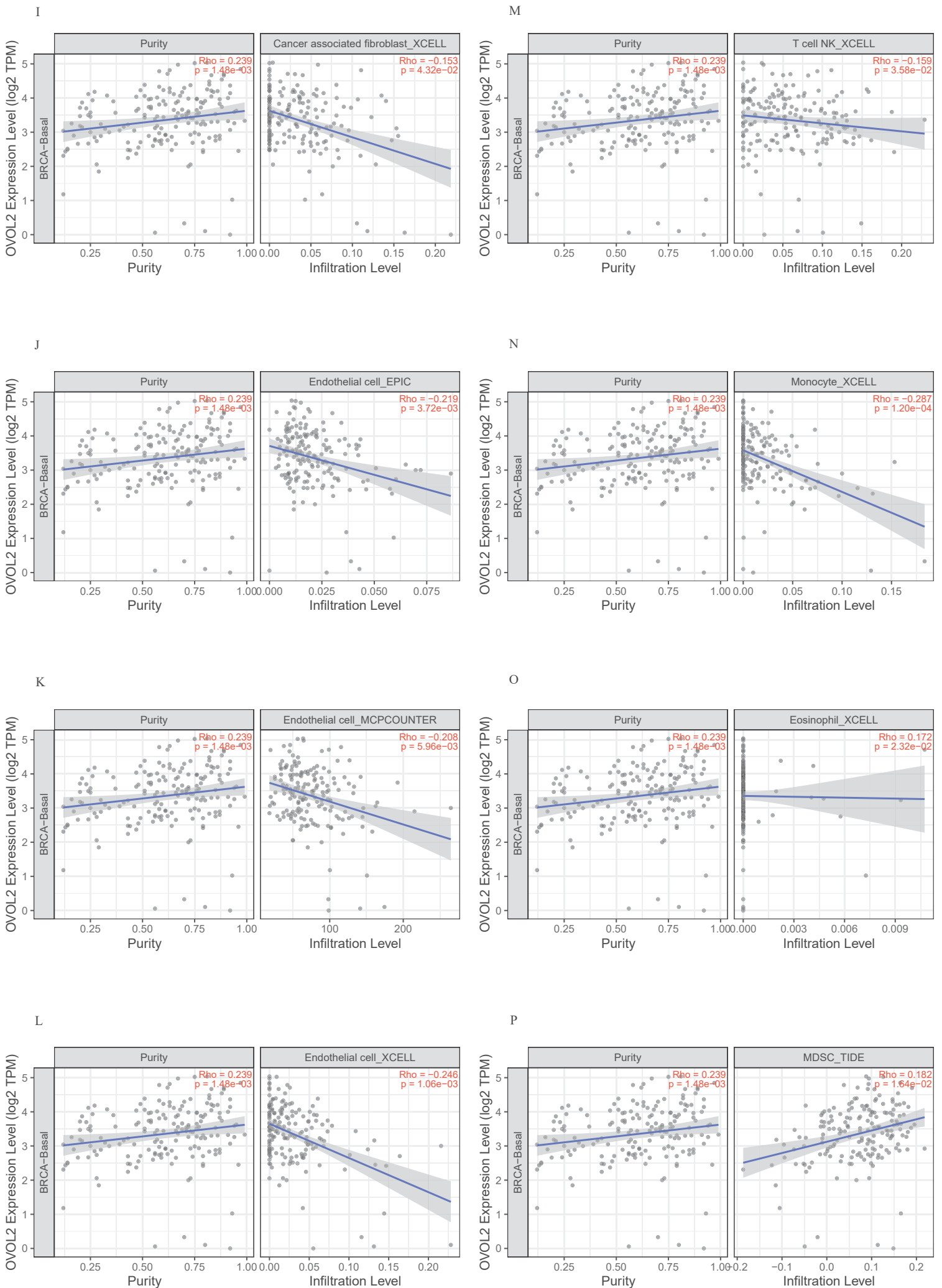


Table S1 Sequences of specific primers for RT-PCR

Gene	Forward primer	Reverse primer
GAPDH	TGGCACCGTCAAGGCTGAGAAC	TGGTGGTGAAGACGCCAGTGGGA
OVOL2	GTCTGCGAGGATTGCGGCTAC	GTATTCTCCTGGTGTGCGGATGTC
OCT	AGGTATTCAGCCAAACGACCATCT	GCCTCTCACTCGGTTCTCGATACT
SOX2	GGTTACCTCTTCCTCCCACTCC	ACATGTGTGAGAGGGGCAGTGT
NANOG	TGCTGAGATGCCTCACACGG	GGGACCTTGTCTTCCTTTTTTGC
18S rRNA	GTCTGTGATGCCCTTAGATG	AGCTTATGACCCGCACTTAC

Table S2 Gene list of downregulated DEGs between GSE7515 and GSE15192

Names	Total	Genes
GSE15192 GSE7515	148	COBL1 ERBB4 MPZL2 EHF STYK1 TC2N C15orf48 TMCC3 XK RAB3IP MREG NOSTRIN AGR3 CXADR RPS6KA5 ST6GALNAC5 SAMD12 MPP7 APOL6 SMIM22 HS3ST1 DOCK8 C3 LAMP3 ARFGEF3 CDS1 PPP1R9A CXorf56 FYB EPHA1-AS1 PRRG4 GCA MIS18BP1 DSC2 CXCL11 SYNE4 RASEF PRR5-ARHGAP8//ARHGAP8 GRHL2 ELOVL7 TFECC KIAA1217 GRIP1 GRHL1 HLA-DPA1 PLS1 EFNA1 KRT8 SYDE2 SVIP MAP7 MARVELD3 MYCT1 LOC100507516 PRR15L CHDH ZNF818P ESR1 OVOL2 NPNT PER2 RAB25 TRIM14 AIF1L GIMAP6 KANK4 GRB14 BCL11B S100A8 MAP3K1 EPCAM NUP210 CD14 HBA2//HBA1 TPD52 JAG2 BLNK RLN2 EPPK1 NCKAP5 ANKEF1 CD24 INHBA KRTCAP3 EPN3 OCLN GALNT6 TBC1D30 KDF1 DENND1B EXPH5 ERBB3 SYK TMRSS3 CLEC7A LOC100505984//ITGB6 LOC100505938 RBM47 STRBP SYTL2 CASZ1 SORD CNTNAP2 MACC1 PDZD2 TNFRSF11A TGFA KIAA0895 PADI2 TTC22 CADM1 ESRP1 CXCL10 CCDC88C ZDHHC21 CCL5 PTAFR RAPGEF5 MIR205HG PPP1R16B COBL PLEKHS1 PATJ HOOK1 NMU IFIH1 LINC00944 KMO CGN ST6GAL1 F11R SCNN1G SLC26A7 ITGB2-AS1 MARVELD2 GATM TMEM56 EPB41L5 VAV3 SCML4 GJA5 ATP8B1 MAL2 EAF2 AGR2 FRMD4B BIRC3
GSE7515	898	PLCE1 SLC30A9 E2F8 UGCG PTN LPP KLHL13 TESMIN FAM65A NBN CXCR4 SOX7 FGL2 CEP70 CXCL14 IGF1 MPPED2 GALNT3 ADCY7 TAF4B LINC01279 TPX2 EPB41L4B SLC28A3 HIST1H4J DEPDC1B C1QC CENPQ PAIP1 DCK CCNB1 CLGN ERG HCP5 FLJ41455 AATK C16orf54 SLC16A14 SEMA4D MMRN2 DOCK2 IRF1 INIP SYNPO2 IGSF3 SH2D1A FLVCR1 GIMAP8 ALOX5 LOC100509445//LOC728715//OVOS//OVOS2 SORL1 GINS3 RNASE6 LEP RC3H1 CYP3R DKK2 EPT1 KIAA2022 RCF3 PTPN22 CMPK2 GEN1 AKAP7 NAPS8 GINS1 CDC14A SNX16 TEK CPNE5 C16orf59 CYP2U1 RNF32 ZNF702P SLC8A1 AP1S2 PHOSPHO2-KLHL23//KLHL23 C1QTNF3 DACH1 ANLN CARD11 CALML4 BIRC5 SELL GNAS TSPAN13 BCLAF1 PHF3 MIS18A STAU2 WASIR2 SERPINB9 IKZF1 LPGAT1 CNTN4 WHSC1L1 GIMAP1 FOXM1 MYO6 CORO2A EZH2 ARL5B FBXO11 ST8SIA4 ATP1B1 NRARP SLCO2A1 FPGT CDK1 POU2AF1 LDLRAD4 MZB1 BTN3A1 TNFSF10 RARRES3 KBTBD3 SAMD13 TMEM255A GMCL1 ZSCAN16 RFX3 LRRC58 SCIN CPEB3 KIF11 PCDH7 C8orf4 SAMS1 KIAA1324 RACGAP1 CENPH OTUD6B FAM110C CARD8 BCAM CD6 TOX3 HLA-DRA MYEF2 USP42 SPOPL RCSI1 ABCB4//ABCB1 ARHGAP45 PPFIA3 TSPAN7 RHOH LY86 PIK3AP1 KLHDC7B C3orf52 CYAT1//IGLV1-44//IGLC1 KIF16B CDC25C ZNF670 SUV39H2 NRIP1 N4BP2 IKZF3 PTPRB NUDT12 ZNF382 EZR DEGS2 FGFR3 ERMP1 FERMT3 MIR15A//DLEU2L//DLEU2 HINT3 LOC102724156 GPR171 NCEH1 DSG2 APLNR TFAP2B IGLL3P INPP5J ARL6IP6 CENPU GPATCH2 DIDO1 MCOLN2 MPV17L PLCXD2 HLF PPIG MIR8071-2//MIR8071-1//IGHV4-31//IGHM//IGHG2//IGHG1 MRE11A PKIB SLAIN1 ZNF765 APOBEC3B SLC9A3R1 GNB4 FCGR1B FOXO6 HLA-DQB1 AURKA ZNF366 ZNF138 ESRRG GZMK C1orf21 KISS1R METTL15 MNDA KIF14 IL18BP SELE IGLV1-44 AHR FAM126B MAD2L1 UHMK1 TRAT1 MLIP SORBS2 MS4A6A FAM169A NKG7 IFI27 BTK TAGAP MAGOHB PVRIG HID1 MAP4K1 CCDC138 LOC101928666 PPM1H UBD//GABBR1 KIN SYNGR2 ZNF738 WT1 BICDL1 CHAF1A IGHG C4orf19 GJA4 CCM2L PIEZO2 ZNF107 IGHM OMD POC1A GSTO2 LCK SLA TTC30B KIR3DX1 EGF GAS2L3 CENPL RSPH1 PAWR IGLJ3 PREX2 RIF1 P115 KLF2 SLC1A2 LOC100506538//NDUF66 KIAA1107 KIF4A ANKRD22 CSPP1 NAIP LTB LPCAT2 NCAPG2 TLR8 HLA-DOA FGFR2 HLA-DMB GDAP1 CCL15-CCL14//CCL14 SAMD9L LMO2 KIT NTN4 DDX60 PEX13 TNFRSF17 ZNF518A C1orf115 UBXLN10 CASP1 RAD54B CD8A CD2AP ZNF792 SDR16C5 BARD1 PARBP IGFLR1 CRISPLD1 SPIN4 MYH11 ZBED6CL MATN3 H1FXA1 CEP83 PKP4 OLR1 HBD ALG10B//ALG10 BCL7A CD2 ZNF614 TMEM176A TCF19 MCM10 FBXO5 PAK3 SOX17 IL20RA TLR5 TTC32 GBP2 IGLL5 VWF CD200 IMPACT ITGA6 TM4SF18 DHTKD1 ZNF468 PTER CD300LG WDFY4 CD93 CCL4 IL15 NET1 TOX GCNT2 LOC100996809//HLA-DRB5//HLA-DRB4//HLA-DRB3//HLA-DRB1 LST1 RUNDC3B LRRC15 SFRP4 VSIG4 DCAF7 TCF15 FBXO3 RNFT2 TPPP3 FL11 FAM72A//FAM72D//FAM72B//FAM72C FAM199X ZNF750 TMEM106C GALNT7 ANKRD36BP2 MELK PODXL CYR1 MDM1 SRGN CLIC5 LOC101928361//ARHGAP15 DLEU2 ASRGL1 EPST11 PRKACB RBP7 RNF43 CDC20 LOC101060835//HLA-DQB1 FOLR2 STYX RIMS1 ADRB2 DEF6 CD3D ZWINT ZNRF2 NDC80 DOCK4 TADA2A ZNF713 TES SNX20 BCOR PLK4 OIP5 GPR18 CCNA2 FMO1 LOC101060835//LOC100996809//HLA-DRB4//HLA-DRB3//HLA-DRB1//HLA-DQB1 NELL2 PLEKHF2 ZG16B LOC101927137//SCLT1 BUB1 RNF138 AIF1 GPR160 PBK SCGB1D2 MB21D1 CD86 TSTD1 RGS18 SP4 DNLZ//CARD9 ORAOV1 ZNF184 RAPGEF4 ZNF813 GBP4 PRR11 IBSP PDIK1L CRISP3 TRIP13 LOC101060835//LOC100996809//HLA-DRB6//HLA-DRB5//HLA-DRB4//HLADR3//HLA-DRB1//HLA-DQB1 HLA-DQA1 FAM26F ALDH5A1 HMGB2 EPHB1 USP37 CREB3L4 CDCA5 CDC7 STMN1 UBE2T TRIM58 LOC439911 GIMAP1-GIMAP5//GIMAP5 CHMP4C CCR7 WEE1 TRIM6 RGS1 FAM84B UCP2 RAB39B P2RY14 TRIM24 HLA-DRB6 CACNA2D2 ECT2 ADGRG6 DEPDC1 KIF23 ASPN PTPRC DHX9 GNLY ITGA4 MCF2L PLPP4 LGALS2 NCAPH MYBL1 MTF2 IQGAP3 SDS EMCN GPR82 VASH2 SLC25A40 P2RY13 TK1 ZBTB42 DIAPH3 PRKAA2 VPS35 GIMAP2 KDR RGS5 TSPDAP1 FAM13C PHIP GPR65 KIF26A SMC2 RMI1 SHCBP1 PECAM1 ABHD5 LOC105376379 EBAG9 MTRF2 BATF2 EIF5B CENPE MB MARCKS ASPM LMNB1 TSPAN12 BPNT1 F13A1 GATA3 PNRC2 GIPC2 PLK2 ARHGAP18 CAPN13 CCR1 PLCH1 TCEAL2 BST2 ESAM INS-IGF2//IGF2 FAM105A LYN INPP4B FAAH2 B3GALNT1 CEP78 CDCA3 SP110 TRIM6- TRIM34//TRIM34 PLCB4 PLCB1 PPEF1 SDPR CNIH2 KNL1 ATAD2 FAM65B CHD7 LOC100996579 EXOSC7//CLEC3B BRIP1 RASGRP1 CFI LOC100507291 UGGT2 GZMA IGKC PIK3CG LY75 COL4A4 GUCY1A2 SASS6 LOC101060835//LOC100996809//HLADR3//HLA-DRB4//HLA-DRB1//HLA-DQB1 PACSIN1 STIL MB UBE2C TMSB15B//TMSB15A MND1 ZC3H12D ZNF268 LSM5 CHML LOC101927027 GIMAP7 CXCR3 CYSLTR1 NLRP2 CHD2 CCNB2 TTC39A KDM4C PLA2G2D POLE2 FOXA1 PRC1 TLR7 SERPINB1 SMAD1 IFI44L STAB1 GIMAP4 LOC100509457//HLA-DQA1 FIGNL1 IFIT1 LIMCH1 TNFSF13B LOC100509457//HLA-DQA2//HLA-DQA1 CD28 SELPLG SLC18A2 CENPW CCDC80 GBP1 CKAP2 CEP55 SPOCK2 MPHOSPH6 SPDF HLADBP1 GPR34 IPCEF1 TET2 EPYC HBG2//HBG1 BIN2 CD74 CORO1A ANAPC16 RRM2 TBL1XR1 LOC101927933//LRRC8C ANKRD36 TMEM71 DDIAS APOLD1 TNFSF8 SLC35F6//CENPA IGLC1 CD52 TOP2A CARD16//CASP1 NCKAP1L MAPK8 LDB2 PRR15 ELOVL2 ATP8A1 CALCRL CXCL9 ESCO1 TMEM52B EGF6 SUZ12P1//SUZ12 HELLS FANCI KLRC2//KLRC1 NSUN6 GZMB FCGR3B CCL28 SHROOM3 LINC01094 ZNF367 CCNE2 CDC45 SMPD3 PDE7A MBTD1 RGS13 USP33 LTF PRSS23 FAM172A RSNB1 RALGPS2 APLN SPC25 WDHD1 RASGRP3 ST6GAL2 TMC01 CD247 SEL1L2//GPR37 MCM4 SMIM14 ZBTB10 SERHL2 SUSD4 TRAC EP300-AS1 GUSBP11 KIF15 ADH1A P2RY10 PRLR MIR155//MIR155HG VMO1 RTP4 NFATC2 LOC101930349//

		<p>LOC101930344///CGNL1 IFNLR1 CD48 CCDC85C HBB ITM2A TARP///TRGV9///TRGC2 SBK1 MGAT4A BUB1B SLAMF7 PDE4B 1-Mar WDR76 DLGAP5 PCDH17 ZFYVE16 MECOM HJURP RAD51AP1 E2F2 AQP1 CARD8-AS1 KLHDC10 PLEKHA2 SYCP2 IL7R LRRRC1 ESCO2 ZNF100 C1orf226 TSPAN18 ATF6 YLPM1 CRIP1 C2orf34 LCP2 SLF1 CA8 IL10RA CKAP2L AKAP5 MKI67 VCAM1 CAP2 FBXO4 DTL REL FAM83D SPAG1 PTTG3P RSAD2 SHANK2 MX1 IL33 VASP HLA-DMA PDK1 SULF1 PPP4R2 ZNF680 CDCA2 ZNF93 ACP1 SLC35A3 MIPOL1 PALD1 TRAF3IP3 MPHOSPH9 MYO1F HMMR TTC6 CD84 HEY2 PIP LAPTM5 NREP NCOA2 GATA2 EXO1 CELSR2 CFB DDX58 LRG1 KLRK4-KLRK1///KLRK1 PRKCH GRP MPEG1 FRZB RHPN2 CENPI ADCY2 CCNF DNAJC3-AS1 GPRIN3 FZD6 ERCC6L SHTN1 KIF20A SHISA2 HLA-DQB2 CLEC4A UCHL5 MIR675///HI9 ICOS IRF8 IGKV1OR2-118 GFRA1 CENPK SLFN5 SOX11 TCEA3 APOC4-APOC2///APOC4///APOC2 FAM46C PREX1 NEURL1B KCND2 CXCR6 NSUN7 IGSF6 HPSE SLC05A1 COL10A1 SETSIP///SETP4///SET PFDN4 BCL11A SLC24A3 MMRN1 TRBC1 GKAP1 FAM117B PLAC8 ZNF823 C1QA ALMS1 HAMP PMPA1 PLVAP CERS6 COL11A1 PEG10 HAUS3 GBP5 CD69 CX3CR1 NORAD CCP110 TRIM59 CEP128 UHRF1 FAM111B GGTA1P SGO2 CHAC2 KIAA0101 RASGRF2 TRPS1 LOC100996809///HLA-DRB4///HLA-DRB1 NRK PAPP9 IGH2A2///IGHA1///IGH LGR4 KLHDC9 TTK TFF1 FSD1L CDKN3 CISH IKGK///IGKC HEATR3 SPINT2 NCAPG RASSF6 LOC283713///OTUD7A TIFA ZNF682 GCNT1 AMIGO2 C21orf58 TRIM36 RMR2 CDH5 HSD17B6 COL6A6 PIM2 VRK1 ZNF678 KLRD1 NEK2 PARD6B TMEM37 USP1 IL7 CENPM THEMIS BEX5 ECSCR JCHAIN RBL1 GINS2 CSF2RB MNX1 IFI44 FAM64A PDLIM5 SPC24 CENPF NUSAP1 KBTBD7 PLGLB1///PLGLB2 CNST NLR3 FANCD2 TMTC2 ACTR2 MEF2C ZNF652 DHRS2 EXOC6 AFF3 ACTR3C C8orf44-SGK3///SGK3 MYB CDC25A CEP295 CDCA8 MIR366///SRSF2 BAIAP2L1 ESM1</p>
GSE15192	826	<p>RIT2 CD44 TNIP3 ALPL2///ALPP C1orf106 BBOX1 CCNA1 THEM6 CADM4 CRTAM ZNF837 LOC100127940 LOC101930363///LOC101928349///LOC100507387///FAM153C///FAM153A/// FAM153B SACS-AS1 TMEM139 EPB41L4A FRAS1 KLK6 COL22A1 CNGB1 MMP7 FAM134B GUCY1A3 KRT17///JUP SIRPB2 LOC105370424 MATR3 S100P PON3 PRKAG2-AS1 ENPP4 FOXQ1 ERV3-1 HLA-DRB4 LOC100129518///SOD2 PDE1C SLC15A2 ESX1 DSP SNHG4 SLC01B3 RHOF PROM2 PAX4 LOC101930241///ARHGFE4 BIK TP53AIP1 LOC284009///METTL16 VEPH1 GPNMB IRX5 CYP2F1 HSD11B2 LINC01360 BASP1 EFN1 DPP10-AS3 CLDN4 NOXO1 DEFB1 ARHGFE7 ARL14 FAM46B YBX2 TIMP3 LOC101927610 PHACTR3 HRK ANXA3 ARL11 TRPM6 SP6 ARHGFE12 PLN FGGY ACAT1 LOC101559451 PDCD4 ATF3 OR6B1 LOC150051 LOC101927668 TAS2R39 BTG1 SIAH3 TMEM30B RIPK4 CAMSAP3 KLK8 A2ML1 GRAMD2 ATP11A MUC16 WDR1 NUP62CL HSPD1 ADGRF1 POLR1E FRMD5 SLC38A10 TFCP2L1 DNMI1 PAK6 SEMA3E LLGL2 FAM98B CD82 LOC100996782///MED18 MBOAT1 MUC1 KLRG2 LOC101928304 MYO5B LOC101927516 TRIM29 THADA ATP1B4 TMRSS11E FAXC DUSP2 STPG1 ELF3 LOC339988 C9orf66 TBX2 PLXNB1 FKBP1ASDCBP2///SDCBP2 CYP1A1 STAT4 LOC642426 AZGP1P1///AZGP1 LOC654342 CTSV VSNL1 PPBP MYO5C POF1B RASSF5 FUT6 STRIP2 SAA2///SAA1 AIMIL TSGA10 DAPP1 STX19 TMEM125 FAM86B3P PLD1 SULT1C2 MNX1-AS1 BAG1 VTCN1 PRDM4 IRF6 MMBAB IFI30///PIK3R2 SERPINB7 AKNAD1 RAPGEFL1 L2HGDH NEBL PRKCD ATP13A4 SERPINA1 HCAR3 ZNF407 C11orf58 SUN1 HSPA4L LIPH GJB3 CYP4F3 PRR5 TSHZ2 FKBP4 GPRC5C CLDN7 STON2 HDAC9 RLN1 LOC100130111 KRT15 ABCB1 MMP20 ERICH5 VGLL1 ALPP VILL DLEC1 PCLO C4orf36 ANXA9 MUC15 FAM83H ARHGFE16 ZNF595 TJP3 TRAF2 SERINC2 HAPLN4 MICALL1 LOC101927972 KCNB2 CDSN FAM226B///FAM226A RRAD PPARGC1A RPE65 LINC00525 PDAP1 STEAP4 KLHL6 EPS8L1 SERPINB2 TMEM238 GJB5 KSR1 SOX9 WDR17 KIAA0226L PITX1 GABRB1 LCN15 CTSS FETUB FA2H ADAMTS9-AS1 TIMM17A MGC57346///CRHR1-IT1 ANO1 IGSF9 P2RX5 NEDD4L WWC1 PLEKHG3 CLDN23 CPVL TLK1 TMEM79 UNC5BAS1 UNC13D LINC00629 ELAVL2 PROSER2 CDC42BPG MYOZ2 SNCAIP SSMEM1 S100A14 DLGAP1 BRE-AS1 LYPD8 TNNI2 DISC1F1 UCA1 DSE GRIN2B PTGES3L HR HERC6 LINTA DCAF1 PEX5L-AS2 XAF1 CEMP1///AMDHD2 XKRX RAB11FIP4 GFM1 FAM49A SLPI MYO5A P2RY2 SLC45A2 TSPAN3 PPP2R2C LHX8 PDC LOC652993 PYHIN1 IL18 MSR1 LOC101927811 RASSF9 LINC01021 BMP2 NPY1R PCDH15 CCDC144A TMEM265///SRCAP CYP4F12 LOC101927490 C1orf210 EPB41L4A-AS2 LOC101928669///LOC644450 IL17RB ACE2 OLIG3 GCH1 MAB21L2 MGAT4D SCNN1B GABRA2 RHOF CLN6 USP2 SPATA31A5///SPATA31A3///SPATA31A1///SPATA31A6 ///SPATA31A7 CLCA2 FAM155A SFN CLMN KCNH6 MUC20 EPHB3 KLC3 C10orf95 PLPP2 YPEL1 RDH16 ITGB8 PDE3A TMC6 ITGB2 LOC100130642 TXNL4A TPD52L1 LOC105373383 PPM1E ZBTB7C TINAGL1 GLI3 CWH43 FAM213A TMEM40 SPRIA SCEL PRKAG2 WDR26 FZD10 GRIA3 PELI1 LOC105369635 LINC01213 SOX15 RXFP1 MALL TCF24 TMEM132A OTUB2 BPY2 HAVCR1 INHBB ABCA12 GP2 WDR86-AS1 LINC01600 LOC339874 MIAPI3 SLC6A14 MFSD14B LAMA5-AS1///LAMA5 LAMA3 KLK9///KLK8 CHODL ABHD17C KRT6A CST5 HOXC-AS3 ZC2HC1A HRASL5 MMP1 CCND3 ADA SAMD5 LRRFIP1 PDE1A GPR88 HEBP2 TMRSS2 MS4A6E GABRA1 ZNF335 ELK4 RECQL5 EPHA1 HNRNPC LINC00161 SH3PXD2A-AS1 FGFBP1 BNC1 ANGPT2 SAA2-SAA4///SAA2///SAA1 CCRL2 CCR4 ADGRG1 GRAMD1C KIAA0040 ZNF165 SLC7A2 C16orf74 IRF4 CDH3 PRKCE DACH2 SCTR BCO1 NR3C2 TG2M1 SH3RF2 LOC105370629 ZDHHC18 LOC100505912 SGPP2 SULT1E1 AP1S3 RHOD DNMT3 ZNF563 CAMKMT OR7E2P LINC01128 LOC729870 FAM207A FCGR2A FOXP2 KMT2E-AS1 ERAP2 TMEM45B TMEM150C BDH1 ARHGFEF37 MIR205 EXOC4 TNC ZNF114 NOL4 PRKCZ MIR3663HG DSC3 IL20 RRP8 B3GNT3 LHCGR SH2D3A KRTAP1-3 PCDH1 TPRG1 KRT80 ANO4 PTPRD SHISA6 LOC150596 KCTD4 ANKMY1 SGK223 SLC44A3 ZNF493 FAM83B PRSS12 NAP1L3 ACAD9 DMKN SMKR1 KIAA00513 C6orf163 ENTHD1 SH3TC2 CA4 TCN1 CKMT1A///CKMT1B BLACAT1 SLC2A12 STARD10 HOMER2 KLK7 ZNF790-AS1 PCGF5 GRAPL SFT2D3 P2RY6 RIN3 CYP27B1 SLC16A6 SLC6A1 C10orf128 LOC100131662 IQCA1 SLC7A5 NFIB PAD14 FGF7 NETO1 PTPRF TAT ANXA8L1///ANXA8 NRL ZSCAN2 CARD10 ACOT11 ANKRD30BP3 CYP4F2 UNC5C B4GALNT3 CDK13 FCHO1 SIRT5 CFAP69 FOXP4-AS1 ST6GALNAC4 GALP CSGALNACT1 VNN1 SDC1 ATP6V1H ISPD-AS1 CDH1 DOK3 GDDP3 PDXNL FUT3 HCG4 P3H2 LOC100131860 ERP27 NAT2 PRRG2 LINC00992 C1QTNF6 LINC01105 LOC100128175 LINGO2 RNF144B PALMD LEMD1 LINC00102 AZGP1 LOC101928741 TMC5 LPAR5 TFAP2C CCDC105 COPG2 C2orf80 LIPG KRT16 CST6 LAD1 GABRP NOX5 ARAP2 TACSTD2 NR5A2 GJB2 LOC102724880 KLK5 FOXI1 LINC01315 LINC00115 PLEKHH1 LOC101928152 ALDH1A1 TASIR2 ADORA3 COL6A5 LOC100506248///MIR1244-2///MIR1244-3///MIR1244-1///LOC728026///PTMA SLC20A2 OR7E24 SPINT1 PWAR6 ANKRD2 ITIH2 CA2 PPM1L MPZL3 MYCN MAPK13 S100A2 TBX18 KCNK15 SLF2 LOC101929748 HIST1H3C TRY2P STAP2 FRK KRT18 RYR2 ADAP1 LOC389641 SPTBN2 DDC CBLN4 PROM1 CRB3 CFTR VSX1 DYNC111 WFDC2 SERAC1 ILDR1 DST CELF2 SMIM2-AS1 ST14 ST3GAL4 METTL7A LOC100996760 KNG1 AFMID ESYT2 DSG3 FCRL5 COX6B2 IL1RN MAFB ZNF396 INPP5D KRT6C///KRT6B ///KRT6A RABEPK PAIP2B ABCA4 HTR1D FABP6 RHBDL2 COL17A1 FILIP1L PDE4DIP IRGC TSPAN1 LYNX1 LINC01003 LINC00301 ZNF793-AS1 PRSS16 FAM84A KRT19 GABRB3 SAMD15 TPT</p>

	<p>GPR17 TYR FLRT3 Dbpht2 HFE HMGCLL1 SEZ6L PPFIBP2 MIR6773///ESRP2 SLC1A3 GLI2 LINC01133 ALDH1A3 ICA1 GNA14 EPS8L2 ZNF560 SLC29A2 FAM122C OSBP2 TTN LINC00487 LOC400590 ERVMER34-1 AKAP13 RUNX1- IT1 HAVCR1P1 SPINK6 PNLIPRP3 MDN1 ALS2CL LOC729680 TNFAIP2 HERC4 ADH1B CYP2A7P1 FLJ32255 C2orf15 PARD6G-AS1 KLK10 LPL RPS6KA1 LSR KIAA0319 LAMC2 SMPDL3B FAM221A QRFPR F5 MRPL45P2 AP1M2 RARRES1 MBP LOC101928702 SOSTDC1 CUL4A TNRC6C-AS1 QSOX1 GPC3 CXCL6 SLC34A2 RNF125 ART3 LINC01056 ANKRD30A CLDN8 PPM1F FZD3 LOC283454 RPARP-AS1 CYP4F2///CYP4F3 GPM6B CLDN1 MROH6 LOC101927668///MACC1 AREL1 GNAT2 KRT5 FDPSP2 SLC27A2 CDH12 BMPR1B PLEKHG1 OVOL1 SP8 FCRLA HLA-DOB CABLES1 XYLB ADH6 BSND COL6A1 PPP1R14C LOC105369507 SIGLEC11 SIAE PRSS8 LCN2 KRT6B ARID4B PKP3 VIPR1 GPR87 SMR3B LY6D JPH1 PTK6 CEACAM1 GRIA4 DLK1 NOD2 ELMO3 LOC100507472///PCSK6 LOC102724362 CDKN2AIPNL CEPT1 PRICKLE1 KCNK5 BSPRY PMP22 DPPA4 LOC105369705 CBLC SERPINB3 STX6 CENPV2///CENPV1 PSCA LRAT MACROD2 LOC101928718///FAM212B LINC01354 CGB7///NTF4 SERPINA3 CYP4F11 AGMAT PRKXP1 TTC9 SPTSSB C4orf26 CXCL16 C1orf116 NF2 QTRT2 FBXO32 SYT9 PPARGC1B IVL PLEKHA6 WNT7B IL10RB-AS1 GAD1 BMP5 BHLHE41 ADGRA3 GS1-124K5.11 KAZN DPP10 C2orf40 ATP6V1B1 FAM155B DENND2D LOC285766 PRKCQ-AS1 UBR4 FXYD3 EVPL TMED4 MROH1 BALAP2 HOXA10-AS///MIR196B LOC340184 ARHGAP27 MISP KRTAP19-3 CDKL1 LINC01568 TP63 GLS2 CYP4B1 ZPBP ABLIM1 LOC102546226 KRT23 SPRR1B TNNT1 S100A9 BICDL2</p>
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Table S3 Gene list of upregulated DEGs between GSE7515 and GSE15192

Names	Total	Genes
GSE15192 GSE7515	96	TRIO NID1 KCN3 CDH13 APCDD1L PRR16 MAOA LOC101930400//AKR1C2 DRAXIN P4HA3 SGCB PHLDA1 PIRFIGF//FIGF PAPP A CXCL8 FN1 OLFML2A LTBP2 CYP19A1 ATP2B2 TRAM2 FKBP10 ABCC3 SYNE3//LINC00341 PLAC9 MRC2 CLIP2 IGFBP2 CRLF1 AGFG2 PTX3 LAMA1 SLC7A11 CHST2 TMEFF2 LARP6 LOC101930400//AKR1C2 //AKR1C1 TIMP1 HMGA2 ARHGEF40 ITGA10 CACNA1C COL3A1 SPRY4-IT1 COL4A2 TMEM158 F2RL2 CD59 SLC22A23 ANGPTL4 FOXC2 LRP1 ANKH IGFBP6 MXRA7 AKAP12 SLC20A1 EMP3 LINC00942 FAT3 RNF24 SRPX ABCA9 TWIST2 PCDHGA1//PCDHGA2//PCDHGA3//PCDHGA4//PCDHGA5//PCDHGA6// PCDHGA7//PCDHGA9// PCDHGA10//PCDHGA11//PCDHGB1//PCDHGB2//PCDHGB3// PCDHGB5//PCDHGB6//PCDHGB7//PCDHGC4// PCDHGC5//PCDHGA12//PCDHGA8//PCDHGB4 //PCDHGC3 COL4A1 SERPINE1 MAP1B MIR612//NEAT1 MYL9 ADH1B AKR1C1 ADM DLC1 RGS17 HSD11B1 SOBP IGFBP3 PTGS1 RNF157 WNT5B PMP22 SNED1 MAMDC2 TFPI2 NANOS1 KCN15 SCG5 ARHGAP22 NPTXR CYP1B1 FBLN5 SPOCD1 WLS SPOCK1
GSE7515	255	RCN3 CLMP XPNPEP2 CSPG4 LAMA2 FRAS1 GDF15 SUSD5 WISP2 ZBED3 TMEM110-MUSTN1// MUSTN1//TMEM110 FLJ40288 PDLIM2 FAM20A PCSK1 RPL36A SUSD2 JAM3 LOC102723886 GPR153 ACVRL1 CLDN11 TIMP3 SQSTM1 UCHL1 DPP4 VAT1L GYPC SLC6A15 DNM1 CRYAB PARVA ACOX1 CD36 EMILIN1 SLC3A1 MIR1908//FADS1 NPR1 NEFM LRRC8A CYP1A1 PENK ARHGEF2 LIF TRO PALM2 PLEKHG2 PPARG CH13L1 P2RX5-TAX1BP3//TAX1BP3//P2RX5 CORO2B DTX1 CBARP SPRY2 MGST1 PBRM1 PLPP7 LMO4 EMP1 PAX8-AS1 VIT AHRR SLC25A18 NPTX2 CDC42SE1 CDADC1 COL6A2 TMEM132C TLL2 HSPB2 AFF4 RAMP1 WNT6 CD248 VVCE RIF1 ZBTB16 RNF112 SHH EDNRB BICD1 PHC2 OR10J1 ZSWIM8 EHD2 NEFL CDC42EP2 NAV2 OXR1 CIDEC BMP2 TAC1 FKBP5 EREG WBSR17 PLCXD3 IRS2 IGFN1 SPECC1 GAP43 FAM87B//FAM87A CDKN2B AREG MME GRIN2A SCARF2 QPCT GRIA3 MLLT3 C7 PCSK9 TNFRSF12A TBX15 FOXO1 BMPER LOC100130872//SPON2 SLC7A8 LOC646014 ADCYAP1R1 MMP1 LAMC1 LRRFIP1 CRTAP ZMAT3 CCDC8 DPP6 PRRX2 ADCY1 ADGRA2 TMEM100 TBC1D16 EIF4B NXPH4 PDPN IFFO1 GPC4 ALDH1L1 HMOX1 MFAP4 TNC MMP3 IGF2BP2 SERPINH1 FAP PRG4 PTGDS MIR34A MFG8 ADAM33 PGF PPP1R14B KLK7 SH3PXD2B NAGLU SCG2 MDM2 OSGIN1 EGFR DNMT3OS CYGB NQO1 EEF1D SRPX2 EVA1B ADORA1 PSAT1 PDLIM4 APH1A FADS3 FAIM2 AMBN SLC39A13 SRSF1 FCGR2C MSX1 LIPG G6PD APOD PAOX PIDI PTPRG EBF2 GPER1 CXCL1 TNFRSF10B RASD1 BTBD18 ANPEP GRIK3 INHBE PLIN5 GRK4 KRT6C//KRT6B//KRT6A BRD7P3 LOC101928635//ALDH1A2 ITIH1 OFCC1 LOC101927057//OMG SMG6 CLIP3 MEG3 KLF15 KCNBI HIPK2 CCND2 NPTX1 SNORA11E//SNORA11D//MAGED4//MAGED4B UPP1 PLEKHA4 GPX3 CERS1//GDF1 MALAT1 GPM6B FAM65C PDE8B ABLIM3 CALD1 COL6A1 DTWD1 AKR1C3 ITGA7 CLEC11A LINC01296//DUXAP10//DUXAP8 PPIA4 F3 CNIH3 MAP4K4 LMNA TMEM119 ACTN1 DNER KIAA0754 POPDC3 GAS6 TMTC1 MYO1D SESN2 ITPRIP SEPN1 FLNA AOX1 GALNT16 RFTN2 TNFRSF10D HGF TNS2 ACSL4 HSPA12A SHMT2 GPCI MEDAG CACNA1G ADAMTS7 VEGFB NDN
GSE15192	1050	TBC1D19 MMP2 PCDHB15 TRAF3IP2-AS1 KCN2 KCNMA1 PRCP DNASE1 ITGA5 LPP PDE6A CNTNAP1 C10orf25 YF1B CD99P1 ZPLD1 DLGAP1-AS1 CLK4 SALL1 CMTM8 CEP70 ADAM12 SEC24D TVP23C-CDRT4//CDRT4//TVP23C IGF1 HSD17B2 CYP39A1 LOC101930115// C16orf52//VWA3A ADGRB2 PELI2 FRMD3 C1R HYI-AS1 ATP9B MEX3B 11-Sep RTN1 KIF7 MMP13 CCDC110 ZEB1 CLGN UCN MSRB3 TSNAX-DISC1//DISC1 DOCK2 CCDC190 SYNPO2 CDK5RAP2 KCTD15 CAPS MIR4435-2HG SLC12A8 GK SLC9A5 EVC HOXA13 SH3RF3 NANOG ALOX5 NRP1 NR2F1 FKBP7 GJA1 DKK2 CCDC50 TAS2R10 FAM129A MYOM1 PTPN22 SLC12A4 SMIM3 GPR137B TGM2 HNMT DIP2C PAPS2 DNAJC22 BDNF-AS STX2 GLT8D2 CCDC106 COL1A1 B3GNT9 CSGALNACT2 EML1 LOC100653057//CES1 TMEM45A CDK12 SLC2A13 C16orf45 LTBP4 GHR SPIRE2 ATP8B2 P3H1 MURC PLEKHO1 ZNF345 LOC101927308//CLDN10 IFNA2 PRKCA-AS1 SEC16B LOC728392 GPR173 CACHD1 APOE LOC101929628 HECTD2 FLT3LG ST8SIA4 GREB1 GSTA4 CHST15 BDNF TMEM98 SLC38A10 FGG DDAH1 CLEC2B ATOH8 PLIN2 COPS4 GLYR1//SEPT6 NFE4 RGL3//EPOR INSC PCDH7 MMP16 FZD2 PART1 SLC2A3 CDH10 TMEM156 SAMSN1 IFT140 FAM102B WDFY2 PRKG2 THADA MPP4 LRRC17 HSD17B11 SEC31B COPZ2 PAG1 DCLK1 SLC9A9 ANKRD28 RGS4 APBB1 ABCB4//ABCB1 B3GALT5 SPTBN1 SPX SRP72 TSPAN7 GRIK2 LTBP1 PCDH18 RGL1 DLGAP4 MBD5 APOB OXTR SDC2 CFH SLITRK4 IGFBP7 ABI2 CDH2 SLC38A4 CCDC102A EPHA5 DYNC1H1 PRAF2 LINC00564 HAL ATP7A LOC101927359 RCAN2 SCD5 IL6R COL7A1 TP73-AS1 SLC47A1 LOC100128079 ORMDL3 EPHA4 CST1 EVI5 CMTM3 SH3RF3-AS1 PLA2R1 GRIK4 QRICHI ZBTB20 UBE2L6 ANTXR2 CCDC169-SOHLH2//SOHLH2 COL4A3 C11orf58 TMEM74 PCDHA5//PCDHA6 IL1RL1 ZNF765 GABRQ TCF4 LOC100507033 MYH1 NKTR DOCK11 ZNF441 PCDHB9//PCDHB10 RHOBTB2 ECM1 PTGFR ZSCAN16-AS1 APLP1 NRG4 STON1 UBE2W FHL1 CNR1 HHIP-AS1 ABCC4 CBX6 PRG3 ZFH4-AS1 RDH8 ZCHC24 NMNAT2 SORBS2 THBD ABCD2 PRRX1 IFITM10 LOC100505555//ZNF846 NMRAL1P1 SLC2A14//SLC2A3 TMEM171 ASPH LOC105377276 TCEA2 AURKB TMEM140 LOC100288893 FAM181B NUA1 PPM1M ABCA8 PLSR4 MAP3K7CL KAZALD1 TNFAIP6 LINC00682 KCNK10 ZNF738 RASSF4 SLC22A1 CCNL2 ZFPM2 A2M-AS1 YWHAH ANXA6 PDGFRB RDX NPRL2 OMD FOXL1 SNAP25 SMPD1 SVIL H2BFXP FBLN1 ANKS1B SVEP1 CDH18 GATS ADGRL4 TLL7 LOC400940 SPOCK3 ARL10 EGR2 GNRH1 CNRIP1 FYN FST LXN NALCN MAPRE3 PREX2 SMOX ITGB1 TMEM253 KLF2 TUBA1A LEF1-AS1 TNFAIP8L3 UCN2 METTL7B VIM RAB9B UGT1A3//UGT1A1 //UGT1A9//UGT1A5//UGT1A8 LINC00853 ZNF221 SERPINB13 SAMD9L PCDHB2 DNAJB4 NAB2 P2RY8 RBM20 LOC100506844 SLIT3 FAM229B PPOX DISP1 ANTXR1 FRG1CP//LOC283788 RAB6B TNFRSF1A PDK2 ETV4 SRGAP2 LOC100293211 PCDHB4 STK32A RPL13P5//LRRC23 CCL20 CCDC74B//CCDC74A XAF1 LINC01091 SPATA6 CRISPLD1 POM121L9P AQP11 WNT5A KALRN ENO2 LINC00965 PCNX4 AADACP1 DUSP1 SEZ6L2 NEGR1 SPRED1 NPTX3 OLAH SULT2A1 FGF12 LOC728705//TMEM263 HAS2 PRDM6 MIR21//VMP1 CDH26 LOC101929373//SLC9B1 CLPS AGPAT4 NT5E PIH2 TM4SF18 ZNF546 GK5 CCND1 ABI3BP LINC00324 SLC17A4 SLC30A4 LOC105379362 TOX MGP GYPA KLF12 GCNT2 WDR78 ARRB1 DPY19L3 TMED5 CDH6 CMKLR1 TNFRSF19 LOC105374325 TRIM69 C1QTNF2 RAPSN TNS1 PDE4D TRPC4 SPATS2L CLIC5 SRGN ZXDB//ZXDA RABL6 GNG2 TNFRSF10C ANG SLC26A11 RIMS1 PROS1 HPGD OR2L13 NEXN-AS1 DNAJC18 ENPP2 CDH11 MFAP3L LINC00622 ANKRD24 LINC01122 NRSN1 PPM1E TGFB1 ADSSL1 ITGA2 PCDHB13 LRRC10B NATD1 FRMD4A CMTM6 C8orf34 MEIS3 GOPC NTRK3 SOCS3 MUC4 MST1 FBN1 IGFL2 KDELR3 DPY19L2P2 RAB31 CPQ

NKX2-1 BGN MR1 GAB2 THAP3 SERPIND1 PCDHGA4 RAPGEF4 LINC01111 CHD1L HEG1 PDK4 TSPAN5 FAM217A
 ST6GALNAC3 ZNF521 DFNA5 CBX2 ALDH5A1 COL8A1 CPED1 CTGF FGF14 ELOVL4 PTARI ADAMTS6 FBXO30
 TNFRSF25 CSRNP3 LIX1L ANGPT1 CARD16 A1BG-AS1 FBXO15 CREM GLMP PTGER4 SMARCA1 EPOR NR2F2
 PLXND1 GREB1L PRDM1 RPS6KA2 TCEAL9 SLC22A3 TOR1A LINC01088 DHRS9 ISYNA1 ADAMTS12 KLHDC1 PDE7B
 LOC100130429 BIN1 CCDC68 PLXNA4 SLC25A30 ENTPD5 SLC38A6 FPR1 FMNL1 GALNT15 PCDHB6 PLIN1 PTPRC
 LINC00504 SLC7A2 RASSF8-AS1 ZNF618 ITGA4 MAGEH1 NR2F2//NR2F1 ZNF333 GPR155 PLPP4 BBOX1-AS1 ROCK1
 CCDC102B TAGLN LOC728485 P3H4 GLIS1 PRDM11 AMPH DPT RGS5 TMEM178B LOC100505851 PRKAR2B MSC-AS1
 ST3GAL2 LUM SYT1 C1S TCF7L1 GRB10 PDGFRL TBL1X MAN1A1 DPF3 KCNT2 LOC107984282 EDIL3 PCDHB7 IFNE
 RARA IKBIP PTPRS LOC101927934 PEX2 MIR181A2HG MYH14 SESN3 PPP1R12B MARCKS AXL LOC101928850
 PCDHB14 MN1 RORA LSP1 PIAS2 TERB2 CDYL2 TTR HHEX PTPRN2 MAOB RANBP3L ATP1A2 INS-IGF2//IGF2
 DUSP6 ST7L LOC642620 IRAK2 TFB2M SERPINE2 ATP5O NTRK2 FOXN3 UGDH IFI6 S100A4 PNMA2 KIAA1644
 ANXA10 PPEF1 PLCB1 SEPP1 SHPK//TRPV1 LOC283075 NUCB2 DKK3 ALOX5AP POSTN SOX5
 WHAMMP2//WHAMMP3 C11orf40 ADAMTS1 DGKI RHOU CADM3 LINC00290 UGGT2 SPRY1 CDON GYS2 PKD1P1
 PLAT ACKR1 MTMR9LP ITGBL1 CD99L2 COL4A4 NETO1 THSD7A ICMT ABCA6 NBEA COL28A1 LIFR FAM19A2
 STXBP6 TMSB15B//TMSB15A ADAMTS15 HSPA9 LINC01449 C1GALT1C1L MYLK KCNAB2 METTL6 CXorf57
 SAMD14 DZIP1 SEC22C GPR161 CBR3 CIB3 TMEM175 PCNP PDX1 IGFBP1 CALHM3 IFI44L NECTIN3 ALDH3A1
 SLC1A1 GGT7 MYT1L LOC100506123//LOC100506076 PLAG1 IFIT1 LPIN2 4-Mar TNFSF13B LEPROT//LEPR
 LOC100506870//LOC283140 ARMC9 RHOB DOCK10 NFE2L3 TENM3 KRT20 CEMIP SLC25A27 LINC00304 CLU
 TMEM91 SLC43A1 ADGRG2 EPG5 TMEM173 SHISA4 PPP4R1L RAB29 FNDC3A LOC101927933//LRRC8C C19orf12
 EPHX1 PDE5A KHDRBS3 SCARA3 TOP2A UBE2E1 EHD3 C5AR2 CAPRN2 UNC93A KLRC3
 PCDHGA3//PCDHGA5//PCDHGA6//PCDHGA10//PCDHGA11//PCDHGA12//PCDHGC3 EFEMP2 CALCRL RECK F2R
 KLB JADE2 MTAP FMO5 ARMCX1 DNAH9 ZFYVE28 KLRK2//KLRK1 NCOR1 NAV1 RAI2 OR5J2 ANKRD44 SLC16A4
 LOC101930405//IGHG1 JAM2 PCDH10 PRR5L LOC100128727//DGKI MSI2 MGC24103 C4orf47 NEXN FUT11 RGS13
 IL6ST PCDHB16 ABHD8 LINC00458 MAP3K12 LOC105371920 PRSS23 CHST7 SEMA6D MYCN SYNE1 ANKRD29 NTF3
 GSDMB EXD3 DKFZp434L192.NID2 ZNF705G EXTL2 GDF11 FUCA1 MFAP2 NR2F1-AS1 SYT11 LOC105379143 SMIM14
 ZBTB10 HTRA1 ZNF585A LOC100505501 SLC26A2 LHFP KANSL3 CAMK1D DST LINC01085 GPX8 GLRX ZEB2 PF4V1
 TOX2 ITM2A NTNG1 TBC1D32 GNG11 GPAM CRYGS PDE4B RUNX2 SLC46A1 LOC102725271//NTM AAGAB CAPN5
 MAPRE2 SSTR1 LOC728613 RUSC2 ZNF396 SOX6 PTPRO TFPI OTOGL DPEP1 MECOM SNAI3-AS1 GFAP TKTL2 PKIA
 CATSPERB GAS1 TLR4 LINC00888 RAB30 CFHR2 SGSH PCDH9 SLC35G2 GPR85 RAP2A TPT1-AS1 ZNF517 HAND2-
 AS1 TAS2R8 VCAN SYDE1 NKAIN2 ERO1B PCDHB12 VCAM1 KANK2 LOC286154 CCDC69 ACTG2 ROBO2 PCDHB3
 NAV3 DNAJB5 ATP6V1G2 KIAA1024 ENTPD1 ARHGEF6 PLPP3 ORAI2 GLIPR1 FGF13 SULF1 ITGA11 NLRP1 WWTR1
 BEST2 KIAA1211 TGFB3 PBXIP1 HHIP ZMYM2 TTTY13 PP12708 ZNF469 SYNJ1 ZNF550 ST3GAL3 PLPP1 CLEC2D
 PTPRM CUL7 APCDD1L-AS1 ETV5 SMC03 CXCL5 LINC00968 CDK19 TCEAL3 ACSL6 AK5 ENPP1 LAPTM5 OLFML3
 PCDHB18P SELM PRR7-AS1 KATNAL2 CCDC85A SPRY4 LOC283788 CCBE1 TAAR1 PAX3 CHSY3 NOV SHISA2
 PPP1R3C LOC102725526//IGHM//IGHG3//IGHG2//IGHG1//IGHA1//IGH MYH4 ADAMTS9-AS2 WFDC10B ATRNL1
 ASB5 CHRNA9 HIVEP3 TIMP2 SIX1 NSG1 CHRM3 LOC101927539 SHC4 PCDHGA11//PCDHGC3 CPE MBNL1-AS1
 SEMA5A CEP170P1//CEP170 WIPF1 STC2 TMEM132B ATP8B3 PDCD1LG2 LCAT ZNF404 PMS1 SIAE GPRC5B BCL11A
 LOC101927552 CERCAM ZNF814 KIAA1462 TGFB1I1 RFX4 TDO2 C1orf228 SHOX2 COL24A1 SPARC ANO3 ZNF821
 FBXL18 CFHR1//CFH TPST1 LAMA4 PCDHB5 DCN IGFBP4 THSD4 SYNPO SLIT2 MYLK3 TEPP CCP110 LOC101928551
 HKDC1 MLLT11 NXPE3 CTHRC1 WFDC1 ZXDB ZNF804A EPS15L1 HIP1 GALNT1 PARD3B LOC440982//ZIC1 FOXD3-
 AS1 LPAR1 ADGRV1 IL18R1 MMP19 MAGED2 BRD3 GEM BNC2 DTX3 SLC45A1 SLC14A1 ARMCX4 ETV1 CEP112
 PCOLCE2 ADAMTS5 NOTCH3 LOC101928910//FAM66C NRG1 LBH PRSS53 SULT1B1 EPHB2 AR KDSR RASA3 GLP2R
 EPB41L5 SLC4A4 ZMYM6 LOC101928673 GIT2 CLDN18 ABHD6 CCDC148 LRRD1 CYR61 COL1A2 NT5C1A AMIGO2
 P3H3 ZCWPW2 SERTAD4-AS1 ABTB1 NPAS3 ZNF697 PRKCA COL6A6 TRIB2 LCN8 ITGB5 LNX1 CFD RNASE4
 PARD6B TMEM37 FMN2 C9orf47 PCDHGA3 PDE4A ATMIN DPYSL3 TTC7B THEMIS BEX5 SOX2 DYX1C1-
 CCPG1//CCPG1 HTRA4 COL12A1 LOC730101 SMAD6 PARM1 IFI44 ZNF358 C6 ZNF440 PHF21A SNX21
 PCDHA1//PCDHA2//PCDHA3//PCDHA4//PCDHA5//PCDHA6//PCDHA7//PCDHA8//PCDHA10//PCDHA11//
 PCDHA12//PCDHA13//PCDHAC1//PCDHAC2//PCDHA9 HLX LOC100507165 MIR210HG SLC25A53 S1PR3 CCDC88A
 MCTP1 MEF2C FAM174B IQGAP2 SPEF2 C12orf54

Table S4 Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) functional enrichment analysis of upregulated DEGs

Biological Process (BP)			
Term	P-value	Combined Score	Genes
nervous system development (GO:0007399)	2.40E-16	318.8341	PCDHGA8;PCDHGA7;PCDHGB7;PCDHGA6;PCDHGB6;PCDHGA5;PCDHGB5;PCDHGA4;PCDHGB4;PCDHGA3;PCDHGC5;PCDHGB3;PCDHGA2;PCDHGC4;PCDHGB2;PCDHGA1;PCDHGC3;PCDHGA9;PCDHGA10;PCDHGA11;PCDHGA12;PCDHGB1;PMP22;SPOCK1
extracellular matrix organization (GO:0030198)	1.24E-07	128.3668	COL3A1;COL4A2;COL4A1;LAMA1;ITGA10;SERPINE1;FN1;CYP1B1;TIMP1;NID1;FBLN5
negative regulation of cell migration (GO:0030336)	6.37E-07	158.5343	TMEFF2;COL3A1;LRP1;IGFBP3;DLC1;SERPINE1;CYP1B1;TIMP1
progesterone metabolic process (GO:0042448)	3.27E-05	473.3669	AKR1C1;AKR1C2;ADM
positive regulation of angiogenesis (GO:0045766)	3.49E-05	100.4717	FOXC2;CXCL8;SERPINE1;CYP1B1;HMGA2;ANGPTL4
negative regulation of smooth muscle cell migration (GO:0014912)	7.13E-05	343.906	LRP1;IGFBP3;SERPINE1
regulation of insulin-like growth factor receptor signaling pathway (GO:0043567)	1.31E-04	265.0683	IGFBP3;IGFBP2;IGFBP6
regulation of smooth muscle cell migration (GO:0014910)	1.57E-04	245.3569	LRP1;IGFBP3;SERPINE1
steroid metabolic process (GO:0008202)	3.14E-04	68.4709	HSD11B1;AKR1C1;CYP1B1;AKR1C2;CYP19A1
positive regulation of vasculature development (GO:1904018)	3.94E-04	63.33852	CXCL8;SERPINE1;CYP1B1;HMGA2;ANGPTL4
Cellular Component (CC)			
Term	P-value	Combined Score	Genes
integral component of plasma membrane (GO:0005887)	2.49E-12	104.3622	PCDHGB7;PCDHGB6;PCDHGB5;LRP1;PCDHGB4;SLC20A1;PCDHGB3;PCDHGB2;SLC7A11;MRC2;ANKH;SGCB;ABCC3;PCDHGA8;PCDHGA7;PCDHGA6;PCDHGA5;PCDHGA4;PCDHGA3;PCDHGC5;PCDHGA2;PCDHGC4;PCDHGA1;PCDHGC3;KCNJ15;ATP2B2;PCDHGA9;PCDHGA10;SLC22A23;PCDHGA11;PCDHGA12;PCDHGB1;KCNK3;F2RL2
endoplasmic reticulum lumen (GO:0005788)	2.14E-04	42.07044	COL3A1;WNT5B;COL4A2;COL4A1;IGFBP3;P4HA3;FN1;TIMP1
focal adhesion (GO:0005925)	0.005456	17.22078	ARHGAP22;MRC2;AKAP12;LRP1;DLC1;CDH13;CD59

platelet alpha granule lumen (GO:0031093)	0.00746	36.86047	SERPINE1;FN1;TIMP1
sarcoplasm (GO:0016528)	0.014586	45.84111	NANOS1;SPOCK1
platelet alpha granule (GO:0031091)	0.016583	22.96573	SERPINE1;FN1;TIMP1
L-type voltage-gated calcium channel complex (GO:1990454)	0.04092	76.73815	CACNA1C
secretory granule lumen (GO:0034774)	0.041119	8.459813	DLC1;SERPINE1;FN1;PTX3;TIMP1
tertiary granule lumen (GO:1904724)	0.042485	19.30388	DLC1;PTX3
caveola (GO:0005901)	0.043891	18.76375	DLC1;CDH13

Molecular Function (MF)

Term	P-value	Combined	Genes
insulin-like growth factor II binding (GO:0031995)	7.06E-06	854.2966	IGFBP3;IGFBP2;IGFBP6
insulin-like growth factor I binding (GO:0031994)	5.62E-05	379.5451	IGFBP3;IGFBP2;IGFBP6
insulin-like growth factor binding (GO:0005520)	7.13E-05	343.906	IGFBP3;IGFBP2;IGFBP6
steroid dehydrogenase activity, acting on the CH-OH group of donors, NAD or NADP as acceptor (GO:0033764)	2.53E-04	198.8894	HSD11B1;AKR1C1;AKR1C2
collagen binding (GO:0005518)	2.59E-04	106.7848	MRC2;ITGA10;FN1;NID1
ketosteroid monooxygenase activity (GO:0047086)	5.18E-04	423.7936	AKR1C1;AKR1C2
bile acid binding (GO:0032052)	9.60E-04	291.9478	AKR1C1;AKR1C2
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 (GO:0016709)	0.001857	77.3396	NANOS1;AKR1C1;AKR1C2
platelet-derived growth factor binding (GO:0048407)	0.001864	192.0523	COL3A1;COL4A1
alditol:NADP+ 1-oxidoreductase activity (GO:0004032)	0.002228	171.0499	AKR1C1;AKR1C2

Kyoto Encyclopedia of Genes and Genomes (KEGG)

Term	P-value	Combined	Genes
Amoebiasis	2.34E-05	111.9944	COL3A1;CXCL8;COL4A2;COL4A1;LAMA1;FN1
Steroid hormone biosynthesis	2.88E-05	146.4217	HSD11B1;AKR1C1;CYP1B1;AKR1C2;CYP19A1
AGE-RAGE signaling pathway in diabetic	2.95E-05	105.174	COL3A1;CXCL8;COL4A2;COL4A1;SERPINE1;

ECM-receptor interaction	1.30E-04	91.71925	COL4A2;COL4A1;LAMA1;ITGA10;FN1
Metabolism of xenobiotics by cytochrome P450	9.94E-04	62.80582	HSD11B1;ADH1B;AKR1C1;CYP1B1
Focal adhesion	0.00123	33.95304	COL4A2;COL4A1;LAMA1;ITGA10;FN1;MYL9
Chemical carcinogenesis	0.001457	53.54404	HSD11B1;ADH1B;CYP1B1;AKR1C2
Small cell lung cancer	0.002314	43.86856	COL4A2;COL4A1;LAMA1;FN1
Arrhythmogenic right ventricular cardiomyopathy (ARVC)	0.009091	32.91636	SGCB;ITGA10;CACNA1C
Complement and coagulation cascades	0.011699	28.39023	SERPINE1;CD59;F2RL2