

Supplementary Table 1 Differentially expressed genes in EAC tissue compared with that in NE tissue in the GSE1420 dataset

| Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value |
|--------------|-------|---------|--------------|-------|---------|--------------|-------|---------|
| TSPAN8 | 5.91 | 0.0000 | AKR7A3 | 0.85 | 0.0205 | ERLIN1 | -0.70 | 0.0118 |
| LGALS4 | 5.17 | 0.0000 | SRI | 0.85 | 0.0011 | MTMR1 | -0.70 | 0.0028 |
| SPINK1 | 5.12 | 0.0000 | CMTM6 | 0.85 | 0.0003 | NRTN | -0.70 | 0.0050 |
| OLFM4 | 5.08 | 0.0002 | PAIP1 | 0.85 | 0.0109 | PHC1 | -0.70 | 0.0000 |
| AGR2 | 4.88 | 0.0000 | TIE1 | 0.85 | 0.0269 | SLC35C1 | -0.70 | 0.0012 |
| TFF1 | 4.65 | 0.0000 | TEAD4 | 0.85 | 0.0005 | FLJ11235 | -0.70 | 0.0002 |
| MMP1 | 4.64 | 0.0003 | PSMB3 | 0.85 | 0.0099 | ECHDC2 | -0.71 | 0.0005 |
| TMC5 | 4.44 | 0.0000 | SPCS3 | 0.85 | 0.0023 | NDEL1 | -0.71 | 0.0031 |
| EPCAM | 4.29 | 0.0000 | FOXM1 | 0.85 | 0.0099 | BNC1 | -0.71 | 0.0078 |
| CTSE | 3.77 | 0.0000 | RNASET2 | 0.85 | 0.0150 | CLDN17 | -0.71 | 0.0151 |
| SERPINA1 | 3.73 | 0.0000 | CDKN2A | 0.85 | 0.0062 | TSPAN5 | -0.71 | 0.0004 |
| GOLM1 | 3.64 | 0.0000 | TMEM5 | 0.85 | 0.0000 | UBAP1 | -0.71 | 0.0000 |
| LYZ | 3.53 | 0.0000 | GUCY2C | 0.84 | 0.0399 | NPAS2 | -0.71 | 0.0015 |
| ABP1 | 3.34 | 0.0001 | RHOQ | 0.84 | 0.0395 | TFAP2A | -0.71 | 0.0003 |
| SLC44A4 | 3.32 | 0.0000 | SLC16A3 | 0.84 | 0.0173 | ARL4C | -0.71 | 0.0398 |
| GATA6 | 3.26 | 0.0000 | HAUS7 | 0.84 | 0.0005 | MVK | -0.71 | 0.0011 |
| CLDN18 | 3.15 | 0.0024 | BTN3A3 | 0.84 | 0.0023 | MID2 | -0.71 | 0.0001 |
| MARCKSL1 | 3.04 | 0.0000 | SLC25A24 | 0.84 | 0.0312 | EPHX2 | -0.71 | 0.0093 |
| SLC39A14 | 3.03 | 0.0000 | MARS | 0.84 | 0.0350 | WSB2 | -0.71 | 0.0233 |

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| DMBT1 | 2.86 | 0.0059 | NASP | 0.84 | 0.0013 | PRDM2 | -0.71 | 0.0042 |
| CDH17 | 2.83 | 0.0009 | GNA11 | 0.84 | 0.0094 | KLHDC8A | -0.71 | 0.0009 |
| VNN1 | 2.75 | 0.0039 | CDHR5 | 0.84 | 0.0378 | RDX | -0.71 | 0.0231 |
| ANXA10 | 2.70 | 0.0030 | MKI67 | 0.84 | 0.0014 | CAPN7 | -0.71 | 0.0270 |
| KRT8 | 2.69 | 0.0000 | IGHD | 0.84 | 0.0402 | USO1 | -0.71 | 0.0081 |
| GDF15 | 2.69 | 0.0003 | RBCK1 | 0.84 | 0.0000 | EPHB6 | -0.72 | 0.0015 |
| MUC13 | 2.68 | 0.0002 | CFI | 0.84 | 0.0292 | MOB4 | -0.72 | 0.0292 |
| TMPRSS3 | 2.68 | 0.0000 | DNAJA1 | 0.84 | 0.0036 | KLF8 | -0.72 | 0.0002 |
| PIP5K1B | 2.65 | 0.0000 | BZW2 | 0.84 | 0.0002 | OTUB2 | -0.72 | 0.0046 |
| CCL20 | 2.64 | 0.0002 | BTN3A1 | 0.84 | 0.0005 | EPHB3 | -0.72 | 0.0162 |
| SEL1L3 | 2.64 | 0.0000 | ARHGAP12 | 0.84 | 0.0213 | LAMP2 | -0.72 | 0.0119 |
| TOX3 | 2.62 | 0.0001 | COPG1 | 0.84 | 0.0000 | SPTLC2 | -0.72 | 0.0460 |
| POSTN | 2.61 | 0.0012 | DDX27 | 0.84 | 0.0001 | WNT5B | -0.72 | 0.0051 |
| HSD17B11 | 2.60 | 0.0000 | PTPRG | 0.83 | 0.0013 | PPDPF | -0.72 | 0.0030 |
| SLC6A14 | 2.59 | 0.0002 | C7orf23 | 0.83 | 0.0013 | SCD | -0.72 | 0.0079 |
| GCNT3 | 2.57 | 0.0009 | SLC35A2 | 0.83 | 0.0045 | LIAS | -0.72 | 0.0000 |
| PGC | 2.55 | 0.0254 | ZNF432 | 0.83 | 0.0046 | LPAR3 | -0.73 | 0.0004 |
| ANPEP | 2.49 | 0.0122 | KIAA1598 | 0.83 | 0.0169 | ACOX3 | -0.73 | 0.0008 |
| IGHM | 2.48 | 0.0004 | PDIA3 | 0.83 | 0.0001 | GFOD1 | -0.73 | 0.0008 |
| KRT20 | 2.45 | 0.0425 | EFHD2 | 0.83 | 0.0000 | JARID2 | -0.73 | 0.0018 |
| SPP1 | 2.44 | 0.0003 | PTPN6 | 0.83 | 0.0004 | HDAC5 | -0.73 | 0.0003 |
| TFF2 | 2.41 | 0.0040 | SLC38A10 | 0.83 | 0.0000 | EDN3 | -0.73 | 0.0374 |

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| TIMP1 | 2.39 | 0.0000 | SLMO2 | 0.83 | 0.0366 | RAB2A | -0.73 | 0.0003 |
| IL8 | 2.37 | 0.0021 | LSM4 | 0.83 | 0.0002 | EIF4E | -0.73 | 0.0094 |
| COL1A1 | 2.36 | 0.0021 | RNF114 | 0.82 | 0.0014 | TLE3 | -0.73 | 0.0213 |
| ISG15 | 2.36 | 0.0002 | PLA2G7 | 0.82 | 0.0011 | NCS1 | -0.73 | 0.0001 |
| TMEM176B | 2.35 | 0.0000 | PTMA | 0.82 | 0.0005 | CD44 | -0.73 | 0.0002 |
| ARPC1B | 2.34 | 0.0000 | PRPS2 | 0.82 | 0.0011 | PLAGL1 | -0.73 | 0.0285 |
| RNF128 | 2.33 | 0.0008 | PIGK | 0.82 | 0.0053 | PAIP2B | -0.73 | 0.0000 |
| HEPH | 2.28 | 0.0038 | AGPAT5 | 0.82 | 0.0228 | HMOX2 | -0.73 | 0.0042 |
| CFB | 2.28 | 0.0000 | CKLF | 0.82 | 0.0002 | CHIC2 | -0.73 | 0.0026 |
| KRT18 | 2.26 | 0.0000 | SPR | 0.82 | 0.0001 | PRMT2 | -0.73 | 0.0032 |
| CALML4 | 2.26 | 0.0023 | TRAM1 | 0.82 | 0.0279 | BSPRY | -0.73 | 0.0125 |
| MET | 2.25 | 0.0000 | SKIL | 0.82 | 0.0000 | SNN | -0.74 | 0.0011 |
| RCN1 | 2.22 | 0.0000 | PTPRO | 0.82 | 0.0172 | WWTR1 | -0.74 | 0.0032 |
| SERPINA3 | 2.22 | 0.0007 | C11orf75 | 0.82 | 0.0074 | BBIP1 | -0.74 | 0.0086 |
| LGALS2 | 2.21 | 0.0135 | SDCBP | 0.82 | 0.0210 | PACSIN3 | -0.74 | 0.0039 |
| FABP1 | 2.21 | 0.0405 | CCDC59 | 0.82 | 0.0090 | TMED2 | -0.74 | 0.0386 |
| PROM1 | 2.20 | 0.0041 | SKAP2 | 0.82 | 0.0190 | GAPDH | -0.74 | 0.0001 |
| HLA-DMA | 2.17 | 0.0000 | OSBPL3 | 0.82 | 0.0003 | THBD | -0.74 | 0.0210 |
| CDH11 | 2.17 | 0.0007 | DYNC2LI1 | 0.82 | 0.0021 | IL12A | -0.74 | 0.0001 |
| PSMB9 | 2.14 | 0.0000 | TYMS | 0.82 | 0.0036 | PGM1 | -0.74 | 0.0022 |
| TMEM97 | 2.13 | 0.0000 | CEP170 | 0.82 | 0.0022 | CARHSP1 | -0.74 | 0.0188 |
| UCP2 | 2.12 | 0.0000 | KIAA0907 | 0.82 | 0.0067 | USP25 | -0.75 | 0.0041 |

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| HSD17B2 | 2.10 | 0.0120 | HPCAL1 | 0.82 | 0.0022 | PADI1 | -0.75 | 0.0007 |
| VOPP1 | 2.09 | 0.0000 | ITGA3 | 0.82 | 0.0006 | ZBTB7C | -0.75 | 0.0001 |
| COL1A2 | 2.09 | 0.0048 | BBX | 0.82 | 0.0413 | RBX1 | -0.75 | 0.0014 |
| TM4SF20 | 2.09 | 0.0113 | C19orf10 | 0.81 | 0.0000 | PLEKHM1 | -0.75 | 0.0068 |
| LUM | 2.07 | 0.0012 | CPQ | 0.81 | 0.0381 | PEX3 | -0.75 | 0.0198 |
| IGF2BP2 | 2.06 | 0.0000 | DAB2 | 0.81 | 0.0122 | SERTAD2 | -0.75 | 0.0148 |
| CD55 | 2.05 | 0.0006 | TIA1 | 0.81 | 0.0176 | ARL2BP | -0.75 | 0.0002 |
| GALC | 2.05 | 0.0001 | PRC1 | 0.81 | 0.0033 | STARD5 | -0.75 | 0.0010 |
| IL32 | 2.02 | 0.0000 | SELPLG | 0.81 | 0.0072 | KLC1 | -0.75 | 0.0056 |
| PRR15L | 2.02 | 0.0002 | RAB7L1 | 0.81 | 0.0071 | ARPC4 | -0.75 | 0.0016 |
| IGKC | 2.01 | 0.0032 | LRRC59 | 0.81 | 0.0001 | PRKAB1 | -0.75 | 0.0002 |
| BST2 | 2.01 | 0.0002 | SCG5 | 0.81 | 0.0394 | KRT32 | -0.75 | 0.0006 |
| PTPRH | 2.01 | 0.0000 | ETV5 | 0.81 | 0.0003 | ST6GALNAC2 | -0.75 | 0.0004 |
| SOX9 | 1.99 | 0.0002 | BID | 0.81 | 0.0001 | ARIH1 | -0.75 | 0.0003 |
| F2RL1 | 1.99 | 0.0052 | FUS | 0.81 | 0.0001 | RPL10A | -0.75 | 0.0012 |
| MMP3 | 1.98 | 0.0384 | MELK | 0.81 | 0.0031 | SH3GLB1 | -0.76 | 0.0232 |
| CXCL3 | 1.97 | 0.0014 | LUC7L3 | 0.81 | 0.0101 | PCBP1 | -0.76 | 0.0003 |
| CREB3L1 | 1.97 | 0.0000 | GOSR1 | 0.81 | 0.0007 | BDKRB1 | -0.76 | 0.0013 |
| COL5A2 | 1.96 | 0.0015 | AP1S1 | 0.81 | 0.0005 | HSPA4 | -0.76 | 0.0110 |
| GALNT6 | 1.96 | 0.0000 | HSP90AA1 | 0.81 | 0.0213 | PPP1CB | -0.76 | 0.0224 |
| EPS8 | 1.96 | 0.0011 | SMURF2 | 0.81 | 0.0256 | DLK2 | -0.76 | 0.0021 |
| HOXB7 | 1.96 | 0.0000 | KLF10 | 0.81 | 0.0333 | SNX24 | -0.76 | 0.0292 |

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| IQGAP2 | 1.95 | 0.0004 | RFC3 | 0.81 | 0.0013 | IL17RC | -0.76 | 0.0006 |
| PARP12 | 1.95 | 0.0000 | MTF2 | 0.81 | 0.0051 | PSMD6 | -0.76 | 0.0004 |
| COL3A1 | 1.94 | 0.0041 | SRRT | 0.80 | 0.0001 | PAFAH1B1 | -0.76 | 0.0081 |
| TESC | 1.93 | 0.0000 | BAZ1B | 0.80 | 0.0012 | MCC | -0.76 | 0.0000 |
| GPX2 | 1.93 | 0.0001 | KIF13B | 0.80 | 0.0002 | QKI | -0.76 | 0.0327 |
| DSG2 | 1.92 | 0.0009 | GATAD1 | 0.80 | 0.0236 | OCA2 | -0.76 | 0.0002 |
| NNMT | 1.92 | 0.0052 | CASP6 | 0.80 | 0.0146 | RXRA | -0.76 | 0.0022 |
| RARRES3 | 1.92 | 0.0001 | LY6E | 0.80 | 0.0305 | MAST4 | -0.77 | 0.0038 |
| PLA2G10 | 1.91 | 0.0009 | PANX1 | 0.80 | 0.0001 | CELSR1 | -0.77 | 0.0043 |
| ATF3 | 1.91 | 0.0028 | HSPH1 | 0.80 | 0.0143 | N4BP1 | -0.77 | 0.0091 |
| ELF3 | 1.89 | 0.0000 | SEC24A | 0.80 | 0.0062 | RBMS1 | -0.77 | 0.0437 |
| TRIM31 | 1.89 | 0.0018 | XPO1 | 0.80 | 0.0084 | MDFIC | -0.77 | 0.0499 |
| PTGER4 | 1.89 | 0.0026 | FBXO11 | 0.80 | 0.0059 | GPC1 | -0.77 | 0.0031 |
| IGJ | 1.89 | 0.0056 | DNAJC10 | 0.80 | 0.0014 | MLLT4 | -0.77 | 0.0003 |
| IFI6 | 1.88 | 0.0024 | STAG3L1 | 0.80 | 0.0010 | ATP6V0A4 | -0.77 | 0.0017 |
| CXCL1 | 1.88 | 0.0035 | MOCOS | 0.80 | 0.0063 | PRMT5 | -0.77 | 0.0011 |
| MMP7 | 1.88 | 0.0033 | MED13 | 0.80 | 0.0060 | SF3B3 | -0.77 | 0.0045 |
| PLAUR | 1.87 | 0.0000 | PSMB2 | 0.80 | 0.0000 | PPP1R7 | -0.77 | 0.0061 |
| IGFBP3 | 1.86 | 0.0000 | SEC63 | 0.80 | 0.0239 | CDH16 | -0.77 | 0.0129 |
| PLS1 | 1.86 | 0.0023 | FUBP1 | 0.80 | 0.0009 | DBI | -0.77 | 0.0210 |
| ARL14 | 1.85 | 0.0054 | TAPBPL | 0.80 | 0.0042 | GULP1 | -0.77 | 0.0236 |
| MUC5AC | 1.85 | 0.0386 | ZNF267 | 0.80 | 0.0009 | HIST1H2BK | -0.77 | 0.0157 |

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| CXCL2 | 1.85 | 0.0005 | ATP1B1 | 0.79 | 0.0240 | HS3ST3A1 | -0.77 | 0.0019 |
| IFI35 | 1.85 | 0.0000 | ZC3H12A | 0.79 | 0.0068 | FOXE1 | -0.78 | 0.0066 |
| FNDC3B | 1.84 | 0.0001 | MAP3K11 | 0.79 | 0.0001 | ATMIN | -0.78 | 0.0235 |
| GPRC5A | 1.84 | 0.0002 | TFAM | 0.79 | 0.0037 | DLAT | -0.78 | 0.0007 |
| GPRC5B | 1.83 | 0.0016 | IFIH1 | 0.79 | 0.0252 | CSNK1A1 | -0.78 | 0.0211 |
| SEZ6L2 | 1.83 | 0.0000 | RAD1 | 0.79 | 0.0028 | PRDM1 | -0.78 | 0.0033 |
| MSLN | 1.82 | 0.0022 | PDE8A | 0.79 | 0.0121 | NDST1 | -0.78 | 0.0006 |
| DDC | 1.82 | 0.0027 | CNPY2 | 0.79 | 0.0040 | NSDHL | -0.78 | 0.0178 |
| MMP12 | 1.82 | 0.0085 | TOB2 | 0.79 | 0.0054 | TACC2 | -0.78 | 0.0075 |
| MLPH | 1.82 | 0.0002 | IDH1 | 0.79 | 0.0435 | NRBP1 | -0.78 | 0.0004 |
| FBP1 | 1.82 | 0.0004 | PLSCR1 | 0.79 | 0.0054 | ASAP3 | -0.78 | 0.0003 |
| PXDN | 1.81 | 0.0012 | ANXA13 | 0.79 | 0.0488 | GLUD1 | -0.78 | 0.0021 |
| TSPAN1 | 1.81 | 0.0046 | SEMA3B | 0.79 | 0.0225 | PPP1R2 | -0.78 | 0.0493 |
| INSR | 1.81 | 0.0000 | RPN1 | 0.79 | 0.0000 | PPP4R1 | -0.78 | 0.0030 |
| SLC20A1 | 1.80 | 0.0000 | RPS6KA1 | 0.79 | 0.0028 | GCHFR | -0.79 | 0.0465 |
| MECOM | 1.80 | 0.0003 | INHBB | 0.79 | 0.0131 | TKT | -0.79 | 0.0004 |
| MEST | 1.79 | 0.0000 | CANX | 0.79 | 0.0016 | DSTN | -0.79 | 0.0375 |
| ECT2 | 1.78 | 0.0000 | SP3 | 0.79 | 0.0342 | FKBP1A | -0.79 | 0.0018 |
| PLOD3 | 1.78 | 0.0000 | SFXN1 | 0.79 | 0.0007 | ERMP1 | -0.79 | 0.0024 |
| MXRA5 | 1.77 | 0.0001 | CPM | 0.79 | 0.0485 | SC5DL | -0.79 | 0.0386 |
| CLDN3 | 1.77 | 0.0062 | DPP4 | 0.79 | 0.0263 | GRN | -0.79 | 0.0119 |
| IFI27 | 1.77 | 0.0001 | FRYL | 0.79 | 0.0084 | BCKDHA | -0.79 | 0.0004 |

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| ANXA4 | 1.77 | 0.0008 | KCNN4 | 0.79 | 0.0194 | DKK4 | -0.79 | 0.0001 |
| TNFSF13 | 1.76 | 0.0001 | EPHB4 | 0.78 | 0.0000 | CPNE3 | -0.79 | 0.0193 |
| LOXL2 | 1.76 | 0.0014 | TRAM2 | 0.78 | 0.0018 | SLC48A1 | -0.79 | 0.0001 |
| RRM2 | 1.75 | 0.0003 | RAP1B | 0.78 | 0.0132 | AHDC1 | -0.79 | 0.0000 |
| C3 | 1.74 | 0.0134 | ABCG1 | 0.78 | 0.0156 | GPM6B | -0.79 | 0.0286 |
| PTPRK | 1.73 | 0.0000 | EDNRA | 0.78 | 0.0154 | SLC6A1 | -0.79 | 0.0003 |
| THBS1 | 1.73 | 0.0075 | RECQL | 0.78 | 0.0382 | FGFR2 | -0.80 | 0.0119 |
| LAMA3 | 1.71 | 0.0007 | TAGLN2 | 0.78 | 0.0013 | EIF2S3 | -0.80 | 0.0132 |
| C11orf9 | 1.71 | 0.0001 | LSM5 | 0.78 | 0.0006 | ELOVL1 | -0.80 | 0.0150 |
| F5 | 1.71 | 0.0046 | PPP1R14D | 0.78 | 0.0270 | EPN2 | -0.80 | 0.0000 |
| KRT7 | 1.71 | 0.0051 | IBTK | 0.78 | 0.0493 | ITPKC | -0.80 | 0.0046 |
| GSDMB | 1.70 | 0.0007 | CASP1 | 0.78 | 0.0232 | SREBF2 | -0.80 | 0.0016 |
| SULT1C2 | 1.70 | 0.0244 | P4HA1 | 0.78 | 0.0017 | BPGM | -0.80 | 0.0054 |
| BIRC3 | 1.69 | 0.0002 | C16orf88 | 0.78 | 0.0024 | CTNND1 | -0.80 | 0.0142 |
| ATP8B1 | 1.68 | 0.0000 | AAK1 | 0.78 | 0.0000 | MT1P2 | -0.80 | 0.0059 |
| C1QB | 1.68 | 0.0006 | ITPK1 | 0.78 | 0.0090 | EXOC5 | -0.80 | 0.0081 |
| KIF3B | 1.67 | 0.0000 | HELLS | 0.78 | 0.0015 | UBL3 | -0.80 | 0.0092 |
| FAM46A | 1.67 | 0.0001 | TRAK1 | 0.78 | 0.0083 | PRDX6 | -0.80 | 0.0021 |
| COL6A3 | 1.66 | 0.0030 | POLR2H | 0.78 | 0.0000 | BNIP3L | -0.80 | 0.0006 |
| MICAL2 | 1.66 | 0.0077 | CXCL11 | 0.78 | 0.0155 | FECH | -0.80 | 0.0000 |
| DDAH1 | 1.65 | 0.0009 | CLIC5 | 0.78 | 0.0434 | HRAS | -0.80 | 0.0078 |
| LYN | 1.64 | 0.0003 | SRSF11 | 0.78 | 0.0055 | NAPA | -0.80 | 0.0002 |

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| TSPAN13 | 1.63 | 0.0000 | HS2ST1 | 0.78 | 0.0044 | ETFDH | -0.80 | 0.0018 |
| C8orf4 | 1.63 | 0.0038 | ICAM3 | 0.77 | 0.0095 | ATP2A2 | -0.80 | 0.0421 |
| VCAN | 1.63 | 0.0094 | CARD10 | 0.77 | 0.0018 | TICAM1 | -0.81 | 0.0022 |
| LAMC2 | 1.63 | 0.0000 | LBR | 0.77 | 0.0398 | SCPEP1 | -0.81 | 0.0033 |
| GATA4 | 1.62 | 0.0224 | PRKCA | 0.77 | 0.0001 | EML3 | -0.81 | 0.0050 |
| CBLB | 1.62 | 0.0001 | SSB | 0.77 | 0.0108 | MFN2 | -0.81 | 0.0010 |
| C19orf21 | 1.62 | 0.0001 | SAC3D1 | 0.77 | 0.0070 | SNAI2 | -0.81 | 0.0281 |
| CYP3A5 | 1.61 | 0.0227 | DMXL2 | 0.77 | 0.0265 | PER2 | -0.81 | 0.0177 |
| LY75 | 1.61 | 0.0021 | B4GALT4 | 0.77 | 0.0255 | EPB41L4A | -0.81 | 0.0002 |
| COL4A1 | 1.61 | 0.0050 | FAM69A | 0.77 | 0.0400 | MCL1 | -0.81 | 0.0028 |
| TNFAIP3 | 1.60 | 0.0024 | ENTPD4 | 0.77 | 0.0078 | PNPLA4 | -0.81 | 0.0022 |
| MDK | 1.60 | 0.0000 | FTSJ2 | 0.77 | 0.0003 | GJB3 | -0.81 | 0.0232 |
| CYBA | 1.60 | 0.0000 | LRPPRC | 0.77 | 0.0116 | LTB4R | -0.81 | 0.0085 |
| RAB20 | 1.59 | 0.0000 | EGR4 | 0.77 | 0.0119 | NEFM | -0.81 | 0.0327 |
| GBP1 | 1.58 | 0.0014 | CXCL10 | 0.77 | 0.0089 | MAPT | -0.81 | 0.0003 |
| VPS13C | 1.58 | 0.0014 | ITM2C | 0.77 | 0.0189 | PITPNA | -0.81 | 0.0003 |
| AGT | 1.58 | 0.0023 | TSR1 | 0.77 | 0.0014 | MT1H | -0.82 | 0.0124 |
| SULT1A1 | 1.57 | 0.0002 | SEC24D | 0.77 | 0.0094 | TSPAN7 | -0.82 | 0.0223 |
| TRIB2 | 1.57 | 0.0000 | AP5Z1 | 0.77 | 0.0017 | PRRG4 | -0.82 | 0.0348 |
| AURKA | 1.57 | 0.0002 | LEPREL4 | 0.77 | 0.0013 | SLC13A4 | -0.82 | 0.0015 |
| FUT8 | 1.57 | 0.0000 | SAMSN1 | 0.76 | 0.0169 | DDX3X | -0.82 | 0.0007 |
| ASPN | 1.56 | 0.0206 | POLR1B | 0.76 | 0.0013 | PI4K2A | -0.82 | 0.0009 |

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| CYR61 | 1.56 | 0.0263 | JMJD6 | 0.76 | 0.0011 | PIGN | -0.82 | 0.0077 |
| DTL | 1.56 | 0.0001 | CDK12 | 0.76 | 0.0316 | CAPNS1 | -0.82 | 0.0001 |
| SRGN | 1.56 | 0.0149 | EVI2B | 0.76 | 0.0056 | TBC1D2 | -0.82 | 0.0052 |
| SPTBN1 | 1.55 | 0.0002 | NCLN | 0.76 | 0.0004 | FNDC4 | -0.82 | 0.0011 |
| VIL1 | 1.55 | 0.0063 | CCNL1 | 0.76 | 0.0093 | CDHR1 | -0.82 | 0.0003 |
| FZD5 | 1.55 | 0.0013 | FAM13A | 0.76 | 0.0374 | DUSP3 | -0.82 | 0.0000 |
| VILL | 1.55 | 0.0032 | RBM12 | 0.76 | 0.0033 | CDH1 | -0.83 | 0.0456 |
| EFNB2 | 1.54 | 0.0006 | NPM1 | 0.76 | 0.0043 | SLC27A6 | -0.83 | 0.0143 |
| IGF2BP3 | 1.54 | 0.0024 | PNISR | 0.75 | 0.0052 | MAPK14 | -0.83 | 0.0000 |
| HEXB | 1.53 | 0.0001 | SRC | 0.75 | 0.0053 | ST3GAL4 | -0.83 | 0.0004 |
| FMO5 | 1.53 | 0.0136 | PAICS | 0.75 | 0.0053 | SPATA5L1 | -0.83 | 0.0106 |
| TMEM176A | 1.52 | 0.0000 | EIF3B | 0.75 | 0.0004 | FOSL2 | -0.83 | 0.0000 |
| KDEL3R | 1.52 | 0.0026 | PTPRR | 0.75 | 0.0032 | GNAI3 | -0.83 | 0.0095 |
| APOBEC3B | 1.51 | 0.0001 | SNRNP1 | 0.75 | 0.0001 | GAPVD1 | -0.83 | 0.0000 |
| SEC62 | 1.51 | 0.0021 | MMP15 | 0.75 | 0.0008 | UBE4B | -0.83 | 0.0004 |
| APOL1 | 1.51 | 0.0007 | EIF1AX | 0.75 | 0.0241 | RNF39 | -0.83 | 0.0009 |
| LSR | 1.51 | 0.0010 | CD52 | 0.75 | 0.0425 | PARD3 | -0.84 | 0.0004 |
| VCAM1 | 1.51 | 0.0006 | PDGFD | 0.75 | 0.0309 | GFOD2 | -0.84 | 0.0001 |
| GRB10 | 1.50 | 0.0001 | AKAP13 | 0.75 | 0.0072 | RCOR1 | -0.84 | 0.0237 |
| TNS3 | 1.50 | 0.0002 | TACC3 | 0.75 | 0.0044 | BARX2 | -0.84 | 0.0001 |
| COL15A1 | 1.50 | 0.0277 | KLF2 | 0.75 | 0.0416 | USP6NL | -0.84 | 0.0087 |
| CXCR4 | 1.50 | 0.0124 | YBX1 | 0.75 | 0.0236 | TFAP2B | -0.84 | 0.0001 |

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|---------|------|--------|----------|------|--------|---------|-------|--------|
| FAT1 | 1.50 | 0.0000 | STAU1 | 0.75 | 0.0028 | IRX5 | -0.84 | 0.0074 |
| IRF8 | 1.50 | 0.0003 | CALU | 0.75 | 0.0173 | PDLIM5 | -0.84 | 0.0053 |
| CTSZ | 1.50 | 0.0001 | CEBPZ | 0.75 | 0.0335 | KLHL21 | -0.84 | 0.0003 |
| WARS | 1.50 | 0.0001 | ERN2 | 0.75 | 0.0003 | ARPC2 | -0.84 | 0.0001 |
| NPIPL3 | 1.49 | 0.0000 | HMGA2 | 0.75 | 0.0022 | SQLE | -0.85 | 0.0218 |
| ARL6IP1 | 1.49 | 0.0002 | NSUN5P2 | 0.75 | 0.0017 | AKR1C1 | -0.85 | 0.0253 |
| THBS2 | 1.49 | 0.0157 | CEBPB | 0.75 | 0.0048 | TTLL12 | -0.85 | 0.0050 |
| ABCC3 | 1.49 | 0.0014 | C1GALT1 | 0.74 | 0.0031 | ADORA2B | -0.85 | 0.0321 |
| PSMB10 | 1.48 | 0.0000 | PTPN2 | 0.74 | 0.0007 | C1orf56 | -0.85 | 0.0003 |
| FUT4 | 1.48 | 0.0008 | CHD1L | 0.74 | 0.0004 | FNTB | -0.85 | 0.0000 |
| LAPTM4B | 1.48 | 0.0000 | ARHGAP26 | 0.74 | 0.0007 | UBE2A | -0.85 | 0.0000 |
| TMEM2 | 1.47 | 0.0000 | COL10A1 | 0.74 | 0.0210 | SMAD2 | -0.85 | 0.0004 |
| IFI30 | 1.47 | 0.0000 | HNF1B | 0.74 | 0.0074 | TUFT1 | -0.85 | 0.0062 |
| CDR2L | 1.47 | 0.0016 | SECTM1 | 0.74 | 0.0015 | IL1A | -0.85 | 0.0259 |
| CD97 | 1.47 | 0.0000 | STOM | 0.74 | 0.0353 | MN1 | -0.85 | 0.0498 |
| PRSS23 | 1.47 | 0.0033 | AGRN | 0.74 | 0.0003 | VPS13D | -0.85 | 0.0000 |
| ASS1 | 1.46 | 0.0009 | LAMC1 | 0.74 | 0.0063 | MFSD1 | -0.85 | 0.0120 |
| SLC16A1 | 1.46 | 0.0003 | DNAJC15 | 0.74 | 0.0002 | SEMA3F | -0.86 | 0.0066 |
| TTK | 1.45 | 0.0001 | ZNF593 | 0.74 | 0.0011 | EIF5 | -0.86 | 0.0238 |
| KCNQ1 | 1.45 | 0.0001 | PHF11 | 0.74 | 0.0048 | RAB6A | -0.86 | 0.0013 |
| IGFBP7 | 1.45 | 0.0111 | TYK2 | 0.74 | 0.0000 | DESI1 | -0.86 | 0.0051 |
| DUSP4 | 1.45 | 0.0097 | ARFGAP3 | 0.73 | 0.0289 | ARHGAP1 | -0.86 | 0.0000 |

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|----------|------|--------|----------|------|--------|-----------|-------|--------|
| NAT1 | 1.45 | 0.0056 | FUT9 | 0.73 | 0.0151 | ATP5A1 | -0.86 | 0.0002 |
| PTP4A2 | 1.45 | 0.0008 | SRSF1 | 0.73 | 0.0181 | RAB9A | -0.86 | 0.0036 |
| CA2 | 1.44 | 0.0480 | ARID4B | 0.73 | 0.0466 | DUSP1 | -0.86 | 0.0168 |
| ABHD11 | 1.44 | 0.0009 | CNOT7 | 0.73 | 0.0095 | GAS7 | -0.86 | 0.0008 |
| ODC1 | 1.44 | 0.0034 | SMARCA5 | 0.73 | 0.0431 | SPTBN2 | -0.86 | 0.0004 |
| ETNK1 | 1.44 | 0.0194 | GTPBP4 | 0.73 | 0.0019 | COPA | -0.86 | 0.0044 |
| ID2 | 1.44 | 0.0005 | CD151 | 0.73 | 0.0045 | GNG4 | -0.86 | 0.0006 |
| COL4A2 | 1.43 | 0.0234 | TRANK1 | 0.73 | 0.0001 | TPM4 | -0.86 | 0.0066 |
| IGLL3P | 1.43 | 0.0057 | MTUS1 | 0.73 | 0.0337 | KCNK7 | -0.87 | 0.0023 |
| LAMP3 | 1.43 | 0.0142 | AMPD2 | 0.73 | 0.0004 | DICER1 | -0.87 | 0.0271 |
| FAM171A1 | 1.43 | 0.0026 | EIF2AK3 | 0.73 | 0.0299 | RMND5A | -0.87 | 0.0060 |
| CTSS | 1.43 | 0.0017 | PHB | 0.73 | 0.0015 | MT1G | -0.87 | 0.0386 |
| C1orf115 | 1.42 | 0.0001 | AATF | 0.73 | 0.0000 | ELOVL4 | -0.87 | 0.0004 |
| PLEKHB1 | 1.42 | 0.0072 | CD63 | 0.73 | 0.0000 | PPIF | -0.87 | 0.0300 |
| ENC1 | 1.42 | 0.0002 | RAD51AP1 | 0.73 | 0.0013 | PGLYRP4 | -0.87 | 0.0044 |
| SPARC | 1.42 | 0.0060 | CTSA | 0.73 | 0.0016 | CALB2 | -0.87 | 0.0022 |
| RGS1 | 1.41 | 0.0184 | YWHAB | 0.73 | 0.0085 | CUL4B | -0.87 | 0.0055 |
| POU2AF1 | 1.41 | 0.0099 | ST7 | 0.73 | 0.0014 | C14orf132 | -0.87 | 0.0261 |
| DUSP6 | 1.41 | 0.0000 | ABCC6 | 0.73 | 0.0012 | KCTD3 | -0.87 | 0.0408 |
| GIPC2 | 1.41 | 0.0012 | TMBIM4 | 0.73 | 0.0111 | LAMP1 | -0.87 | 0.0010 |
| PLA2G16 | 1.41 | 0.0009 | COX17 | 0.73 | 0.0040 | BCL2L2 | -0.88 | 0.0063 |
| C1S | 1.41 | 0.0094 | ATM | 0.73 | 0.0000 | RER1 | -0.88 | 0.0019 |

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|----------|------|--------|----------|------|--------|---------|-------|--------|
| VEGFA | 1.41 | 0.0003 | NIPBL | 0.73 | 0.0381 | CDK7 | -0.88 | 0.0255 |
| ITGA6 | 1.41 | 0.0006 | PION | 0.73 | 0.0136 | GPSM2 | -0.88 | 0.0231 |
| EPS8L3 | 1.40 | 0.0008 | CDK4 | 0.73 | 0.0067 | NGFRAP1 | -0.88 | 0.0239 |
| CKS2 | 1.40 | 0.0010 | GSTO1 | 0.73 | 0.0030 | TXN | -0.88 | 0.0181 |
| SEPHS2 | 1.40 | 0.0001 | ADAMDEC1 | 0.73 | 0.0163 | PEA15 | -0.88 | 0.0001 |
| CBX3 | 1.39 | 0.0003 | HSPG2 | 0.72 | 0.0123 | TPGS2 | -0.88 | 0.0002 |
| BFAR | 1.39 | 0.0000 | BUB3 | 0.72 | 0.0005 | ACTR1A | -0.88 | 0.0003 |
| FLRT3 | 1.38 | 0.0040 | TRIM15 | 0.72 | 0.0191 | FBXO34 | -0.88 | 0.0063 |
| CD74 | 1.38 | 0.0002 | MAGED1 | 0.72 | 0.0021 | RAB14 | -0.88 | 0.0050 |
| CEP55 | 1.38 | 0.0000 | PLEKHS1 | 0.72 | 0.0090 | KRT23 | -0.88 | 0.0438 |
| SLC46A3 | 1.38 | 0.0011 | PHIP | 0.72 | 0.0070 | TGM5 | -0.88 | 0.0003 |
| STAT1 | 1.38 | 0.0015 | BUB1 | 0.72 | 0.0007 | ATP6V1A | -0.89 | 0.0087 |
| MICALL2 | 1.37 | 0.0000 | FERMT1 | 0.72 | 0.0255 | MALT1 | -0.89 | 0.0046 |
| MUC1 | 1.37 | 0.0173 | MGAT4B | 0.72 | 0.0073 | NOTCH3 | -0.89 | 0.0042 |
| PRPF40A | 1.37 | 0.0007 | KIAA0040 | 0.72 | 0.0010 | CYP11A1 | -0.89 | 0.0000 |
| GLRX | 1.36 | 0.0022 | PDXDC1 | 0.72 | 0.0061 | SPAG16 | -0.89 | 0.0432 |
| TCIRG1 | 1.36 | 0.0000 | PSMB4 | 0.72 | 0.0003 | PHACTR4 | -0.89 | 0.0150 |
| EXT1 | 1.36 | 0.0001 | TTI1 | 0.72 | 0.0023 | MRPL39 | -0.89 | 0.0000 |
| FA2H | 1.36 | 0.0053 | ATP9A | 0.72 | 0.0021 | ROGDI | -0.90 | 0.0001 |
| SERPINH1 | 1.36 | 0.0003 | LAP3 | 0.72 | 0.0381 | RCBTB2 | -0.90 | 0.0007 |
| MTHFD2 | 1.35 | 0.0000 | RPP25 | 0.72 | 0.0043 | ENSA | -0.90 | 0.0015 |
| RRBP1 | 1.35 | 0.0000 | FEZ2 | 0.72 | 0.0123 | KRT31 | -0.91 | 0.0058 |

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|---------|------|--------|----------|------|--------|----------|-------|--------|
| DNAJC2 | 1.34 | 0.0003 | ZNF232 | 0.72 | 0.0048 | COL17A1 | -0.91 | 0.0014 |
| TCF7 | 1.34 | 0.0000 | PDSS2 | 0.72 | 0.0018 | SEMA4A | -0.91 | 0.0014 |
| TXNRD1 | 1.34 | 0.0006 | BAMBI | 0.72 | 0.0272 | RAB4A | -0.91 | 0.0201 |
| CDR2 | 1.34 | 0.0012 | HSP90AB1 | 0.71 | 0.0004 | CTNNBIP1 | -0.91 | 0.0000 |
| GUSBP11 | 1.34 | 0.0044 | USP14 | 0.71 | 0.0307 | MOSPD1 | -0.91 | 0.0036 |
| GRK5 | 1.33 | 0.0033 | FABP6 | 0.71 | 0.0157 | ATP10D | -0.91 | 0.0042 |
| PRR11 | 1.33 | 0.0000 | FGFR1 | 0.71 | 0.0004 | MTERFD2 | -0.91 | 0.0000 |
| NMI | 1.33 | 0.0006 | RBM22 | 0.71 | 0.0001 | OAT | -0.91 | 0.0132 |
| CASP7 | 1.33 | 0.0019 | KIF2C | 0.71 | 0.0004 | MICALL1 | -0.91 | 0.0036 |
| C5orf15 | 1.33 | 0.0001 | HEXA | 0.71 | 0.0010 | LTA4H | -0.91 | 0.0002 |
| SDC4 | 1.33 | 0.0003 | USP33 | 0.71 | 0.0385 | KCTD15 | -0.92 | 0.0000 |
| SEMA3C | 1.33 | 0.0267 | VASP | 0.71 | 0.0002 | CIDEA | -0.92 | 0.0026 |
| ADAM28 | 1.33 | 0.0205 | NCOR2 | 0.71 | 0.0045 | GSTP1 | -0.92 | 0.0120 |
| LBH | 1.33 | 0.0167 | CTBP1 | 0.71 | 0.0001 | VDAC2 | -0.92 | 0.0000 |
| U2SURP | 1.33 | 0.0024 | FKBP9 | 0.71 | 0.0001 | PHGDH | -0.92 | 0.0038 |
| TM4SF5 | 1.32 | 0.0045 | SLC22A18 | 0.71 | 0.0444 | DLG1 | -0.92 | 0.0206 |
| TRIB1 | 1.32 | 0.0001 | MXRA8 | 0.71 | 0.0298 | SIAH2 | -0.92 | 0.0002 |
| A2M | 1.32 | 0.0109 | CENPM | 0.71 | 0.0020 | TAB2 | -0.92 | 0.0002 |
| HOXC10 | 1.31 | 0.0179 | WHSC1 | 0.71 | 0.0003 | EZR | -0.92 | 0.0093 |
| HLA-F | 1.31 | 0.0000 | KIAA0528 | 0.71 | 0.0164 | AMFR | -0.93 | 0.0004 |
| PDE4C | 1.31 | 0.0000 | SMG7 | 0.71 | 0.0004 | FKBP5 | -0.93 | 0.0374 |
| COL5A1 | 1.31 | 0.0094 | RAB40B | 0.71 | 0.0196 | MOXD1 | -0.93 | 0.0006 |

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|----------|------|--------|---------|------|--------|-----------|-------|--------|
| ANO1 | 1.31 | 0.0023 | BMS1 | 0.70 | 0.0009 | STK24 | -0.93 | 0.0004 |
| PDIA4 | 1.31 | 0.0000 | SRSF3 | 0.70 | 0.0005 | DIO2 | -0.93 | 0.0122 |
| FOXA2 | 1.30 | 0.0000 | SIL1 | 0.70 | 0.0004 | SSBP2 | -0.93 | 0.0013 |
| EPB41L4B | 1.30 | 0.0037 | PAPOLA | 0.70 | 0.0270 | CALM1 | -0.93 | 0.0173 |
| CASK | 1.30 | 0.0003 | RIPK2 | 0.70 | 0.0003 | PDCD6 | -0.93 | 0.0019 |
| MFHAS1 | 1.30 | 0.0005 | TAF1D | 0.70 | 0.0053 | CD99 | -0.93 | 0.0020 |
| MTDH | 1.30 | 0.0007 | CNPY3 | 0.70 | 0.0000 | LOC440434 | -0.93 | 0.0102 |
| N4BP2L2 | 1.30 | 0.0003 | NUAK1 | 0.70 | 0.0190 | LPIN1 | -0.93 | 0.0012 |
| GALNT10 | 1.30 | 0.0006 | MGAT5 | 0.70 | 0.0002 | CLDN8 | -0.93 | 0.0005 |
| RCAN1 | 1.29 | 0.0068 | ECE1 | 0.70 | 0.0006 | OXCT1 | -0.93 | 0.0039 |
| ALDH1A1 | 1.29 | 0.0479 | HDAC9 | 0.70 | 0.0091 | AKR7A2 | -0.93 | 0.0006 |
| SOX4 | 1.29 | 0.0001 | SMC5 | 0.70 | 0.0060 | KRT2 | -0.93 | 0.0018 |
| ADH1C | 1.29 | 0.0292 | DKC1 | 0.70 | 0.0008 | MKNK2 | -0.93 | 0.0001 |
| KCNK1 | 1.29 | 0.0046 | PLIN2 | 0.70 | 0.0124 | MAPK1 | -0.93 | 0.0000 |
| TAP1 | 1.29 | 0.0005 | NR5A2 | 0.70 | 0.0001 | RAB11A | -0.94 | 0.0032 |
| TSPAN3 | 1.29 | 0.0057 | TMEM248 | 0.70 | 0.0014 | ELMO2 | -0.94 | 0.0001 |
| AVL9 | 1.29 | 0.0002 | TBC1D8B | 0.70 | 0.0088 | PORCN | -0.94 | 0.0032 |
| MICB | 1.28 | 0.0000 | RBM26 | 0.70 | 0.0074 | ASCC2 | -0.94 | 0.0003 |
| HOXA10 | 1.28 | 0.0009 | PLXND1 | 0.70 | 0.0125 | IGSF3 | -0.94 | 0.0001 |
| SLC2A3 | 1.28 | 0.0123 | SH2B2 | 0.70 | 0.0009 | SH3GL3 | -0.94 | 0.0001 |
| NR1I2 | 1.28 | 0.0086 | TBC1D1 | 0.70 | 0.0157 | MFSD5 | -0.94 | 0.0151 |
| PRKCI | 1.28 | 0.0039 | RBBP4 | 0.69 | 0.0066 | NEFL | -0.94 | 0.0266 |

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|---------|------|--------|----------|------|--------|----------|-------|--------|
| LAPTM5 | 1.28 | 0.0031 | HTATIP2 | 0.69 | 0.0094 | ME1 | -0.94 | 0.0247 |
| PDGFA | 1.28 | 0.0008 | HMGNA4 | 0.69 | 0.0301 | DUSP22 | -0.94 | 0.0001 |
| DAPK1 | 1.28 | 0.0045 | ACTL6A | 0.69 | 0.0009 | TOM1 | -0.94 | 0.0040 |
| IFITM1 | 1.28 | 0.0044 | YTHDF1 | 0.69 | 0.0002 | KIAA1609 | -0.95 | 0.0011 |
| ALCAM | 1.28 | 0.0048 | DIABLO | 0.69 | 0.0002 | TAX1BP3 | -0.95 | 0.0018 |
| DDX60 | 1.28 | 0.0082 | CDK5RAP3 | 0.69 | 0.0008 | AGA | -0.95 | 0.0273 |
| CDK1 | 1.28 | 0.0002 | WDR43 | 0.69 | 0.0061 | PINK1 | -0.95 | 0.0001 |
| FNBP1L | 1.28 | 0.0002 | MDC1 | 0.69 | 0.0031 | GPD1L | -0.95 | 0.0083 |
| MMP9 | 1.27 | 0.0053 | PCK2 | 0.69 | 0.0102 | CPEB3 | -0.96 | 0.0021 |
| NEK2 | 1.27 | 0.0001 | CCNB1 | 0.69 | 0.0436 | MAP3K6 | -0.96 | 0.0004 |
| DRAM1 | 1.27 | 0.0000 | ALG5 | 0.69 | 0.0011 | HMGCR | -0.96 | 0.0394 |
| RHOBTB1 | 1.27 | 0.0002 | MAN2B1 | 0.69 | 0.0031 | H2BFS | -0.96 | 0.0041 |
| FARP1 | 1.27 | 0.0001 | TROVE2 | 0.69 | 0.0137 | AKR1C2 | -0.96 | 0.0177 |
| ACSL5 | 1.27 | 0.0067 | ITGB2 | 0.69 | 0.0307 | VPS4B | -0.96 | 0.0057 |
| STC1 | 1.26 | 0.0042 | RPA3 | 0.69 | 0.0001 | GABRE | -0.96 | 0.0029 |
| SH3BP4 | 1.26 | 0.0002 | CHD1 | 0.69 | 0.0359 | CD59 | -0.96 | 0.0025 |
| IRF1 | 1.26 | 0.0004 | STX3 | 0.69 | 0.0084 | MEIS1 | -0.96 | 0.0104 |
| ZNF468 | 1.26 | 0.0010 | DNPEP | 0.69 | 0.0003 | AACS | -0.97 | 0.0044 |
| DLC1 | 1.26 | 0.0353 | FAM105A | 0.69 | 0.0049 | FLII | -0.97 | 0.0001 |
| CCL5 | 1.25 | 0.0139 | TCERG1 | 0.69 | 0.0186 | NOTCH2 | -0.97 | 0.0001 |
| IQCE | 1.25 | 0.0001 | RUNX3 | 0.68 | 0.0297 | HBP1 | -0.97 | 0.0006 |
| LAMB3 | 1.25 | 0.0005 | MATR3 | 0.68 | 0.0104 | VAT1 | -0.97 | 0.0003 |

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|---------|------|--------|----------|------|--------|----------|-------|--------|
| SLC35E1 | 1.25 | 0.0000 | CHMP7 | 0.68 | 0.0009 | TMEM159 | -0.97 | 0.0002 |
| CD93 | 1.24 | 0.0079 | INTS8 | 0.68 | 0.0134 | ACSL1 | -0.97 | 0.0080 |
| TOP2A | 1.24 | 0.0020 | HMGB1 | 0.68 | 0.0091 | DNAJA2 | -0.97 | 0.0001 |
| RGS5 | 1.24 | 0.0253 | COL16A1 | 0.68 | 0.0005 | WDR47 | -0.97 | 0.0010 |
| LPCAT1 | 1.24 | 0.0001 | TMEM177 | 0.68 | 0.0020 | RNH1 | -0.97 | 0.0001 |
| BTBD3 | 1.24 | 0.0096 | FANCL | 0.68 | 0.0023 | MAX | -0.98 | 0.0000 |
| PLOD2 | 1.24 | 0.0031 | GANAB | 0.68 | 0.0002 | CEACAM1 | -0.98 | 0.0392 |
| LACTB2 | 1.24 | 0.0057 | FLOT1 | 0.68 | 0.0001 | LRP10 | -0.98 | 0.0001 |
| NR4A2 | 1.24 | 0.0070 | SET | 0.68 | 0.0235 | TSPO | -0.99 | 0.0109 |
| APOE | 1.24 | 0.0044 | ACHE | 0.68 | 0.0057 | OVOL1 | -0.99 | 0.0020 |
| BTN3A2 | 1.24 | 0.0003 | SH2B3 | 0.68 | 0.0009 | TMEM134 | -0.99 | 0.0012 |
| LPGAT1 | 1.24 | 0.0004 | TMEM184B | 0.68 | 0.0010 | SCGB1A1 | -0.99 | 0.0390 |
| FCER1G | 1.24 | 0.0020 | SIGIRR | 0.68 | 0.0001 | ADRB2 | -1.00 | 0.0001 |
| CDC20 | 1.23 | 0.0011 | MLXIP | 0.68 | 0.0149 | LDOC1 | -1.00 | 0.0001 |
| FAR2 | 1.23 | 0.0007 | CCDC109B | 0.68 | 0.0031 | SORT1 | -1.00 | 0.0001 |
| SP140L | 1.23 | 0.0009 | CFDP1 | 0.68 | 0.0208 | PLS3 | -1.00 | 0.0108 |
| TFRC | 1.23 | 0.0065 | HSPA13 | 0.68 | 0.0222 | HLA-DQB2 | -1.00 | 0.0036 |
| KRIT1 | 1.23 | 0.0064 | BAK1 | 0.68 | 0.0029 | SQRDL | -1.00 | 0.0009 |
| FKBP11 | 1.23 | 0.0014 | ARSE | 0.68 | 0.0082 | NOL3 | -1.00 | 0.0001 |
| TBC1D30 | 1.23 | 0.0010 | PTP4A1 | 0.68 | 0.0432 | ALDOC | -1.00 | 0.0048 |
| APOC1 | 1.23 | 0.0007 | ENG | 0.68 | 0.0297 | MXI1 | -1.00 | 0.0067 |
| CDC25B | 1.22 | 0.0003 | PTP4A3 | 0.68 | 0.0140 | ABLIM3 | -1.00 | 0.0016 |

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|-----------|------|--------|----------|------|--------|----------|-------|--------|
| ATG12 | 1.22 | 0.0050 | FZD2 | 0.68 | 0.0258 | KAZN | -1.00 | 0.0027 |
| RGS3 | 1.22 | 0.0004 | CHD8 | 0.68 | 0.0017 | BAIAP2 | -1.00 | 0.0006 |
| ASAP2 | 1.22 | 0.0007 | PIK3R3 | 0.68 | 0.0494 | RARG | -1.01 | 0.0006 |
| MUC3B | 1.22 | 0.0006 | CLIC1 | 0.67 | 0.0007 | PGK1 | -1.01 | 0.0003 |
| S100P | 1.22 | 0.0470 | EXOSC8 | 0.67 | 0.0219 | ADIPOR1 | -1.01 | 0.0001 |
| STEAP1 | 1.22 | 0.0044 | LRFN4 | 0.67 | 0.0037 | IRX4 | -1.01 | 0.0016 |
| DPYSL2 | 1.22 | 0.0340 | PSMD13 | 0.67 | 0.0022 | CCDC6 | -1.01 | 0.0007 |
| EIF2AK1 | 1.22 | 0.0000 | NSUN5P1 | 0.67 | 0.0059 | TRIP10 | -1.01 | 0.0005 |
| ERAP2 | 1.22 | 0.0049 | FAM115A | 0.67 | 0.0010 | THSD4 | -1.01 | 0.0004 |
| LASP1 | 1.21 | 0.0003 | CLN5 | 0.67 | 0.0063 | HEXIM1 | -1.01 | 0.0001 |
| TNFRSF10B | 1.21 | 0.0000 | MFSD10 | 0.67 | 0.0004 | ATP6V1D | -1.02 | 0.0001 |
| EPB41L2 | 1.21 | 0.0014 | PDIA6 | 0.67 | 0.0003 | CHP1 | -1.02 | 0.0008 |
| C10orf10 | 1.21 | 0.0055 | C1RL | 0.67 | 0.0268 | PLP2 | -1.02 | 0.0010 |
| BGN | 1.21 | 0.0014 | CHPF | 0.67 | 0.0005 | SDHC | -1.02 | 0.0000 |
| GNS | 1.21 | 0.0007 | VAPB | 0.67 | 0.0042 | C10orf57 | -1.02 | 0.0000 |
| BMP2 | 1.21 | 0.0009 | CCRL2 | 0.67 | 0.0005 | CAPN1 | -1.02 | 0.0035 |
| PSMB8 | 1.21 | 0.0000 | RND1 | 0.67 | 0.0007 | IL13RA1 | -1.02 | 0.0085 |
| F2R | 1.21 | 0.0004 | NCAPG | 0.67 | 0.0032 | MAP2K1 | -1.02 | 0.0003 |
| PLCB1 | 1.21 | 0.0219 | SAFB2 | 0.67 | 0.0023 | HMOX1 | -1.03 | 0.0226 |
| ITPR3 | 1.20 | 0.0001 | MAST2 | 0.67 | 0.0073 | SMARCA2 | -1.03 | 0.0074 |
| HMMR | 1.20 | 0.0001 | ANKRD36B | 0.67 | 0.0024 | ZBTB5 | -1.03 | 0.0000 |
| CST1 | 1.20 | 0.0096 | KPNB1 | 0.66 | 0.0080 | ERO1L | -1.03 | 0.0329 |

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|----------|------|--------|--------|------|--------|---------|-------|--------|
| HLA-B | 1.20 | 0.0000 | HYOU1 | 0.66 | 0.0001 | PGAM1 | -1.03 | 0.0000 |
| CTSH | 1.20 | 0.0004 | TPP1 | 0.66 | 0.0002 | RNF11 | -1.04 | 0.0109 |
| RARRES1 | 1.20 | 0.0102 | SF3B1 | 0.66 | 0.0120 | PDLIM4 | -1.04 | 0.0038 |
| FBXW12 | 1.20 | 0.0000 | COCH | 0.66 | 0.0226 | YWHAE | -1.04 | 0.0089 |
| MLEC | 1.19 | 0.0005 | PSMA7 | 0.66 | 0.0019 | C9orf3 | -1.04 | 0.0001 |
| E2F3 | 1.19 | 0.0000 | LIPG | 0.66 | 0.0110 | ID4 | -1.04 | 0.0056 |
| IFI44 | 1.19 | 0.0162 | CRELD2 | 0.66 | 0.0012 | HPGD | -1.04 | 0.0312 |
| RNASE1 | 1.19 | 0.0224 | TAOK3 | 0.66 | 0.0269 | EXPH5 | -1.05 | 0.0149 |
| HLA-DQA1 | 1.19 | 0.0442 | WSB1 | 0.66 | 0.0389 | CLDN10 | -1.05 | 0.0008 |
| TGFBI | 1.19 | 0.0038 | KLHL24 | 0.66 | 0.0011 | ACADM | -1.05 | 0.0247 |
| ZNF721 | 1.19 | 0.0001 | SHC1 | 0.66 | 0.0002 | AMOTL2 | -1.05 | 0.0002 |
| ADAM9 | 1.19 | 0.0224 | STARD7 | 0.66 | 0.0004 | MEGF9 | -1.05 | 0.0038 |
| TAPBP | 1.19 | 0.0000 | NIPA2 | 0.66 | 0.0019 | LSS | -1.05 | 0.0002 |
| RAI14 | 1.19 | 0.0089 | PCBP2 | 0.66 | 0.0081 | LPAR6 | -1.06 | 0.0354 |
| SULF1 | 1.19 | 0.0190 | TMEM48 | 0.66 | 0.0220 | PRKCH | -1.06 | 0.0003 |
| ASNS | 1.19 | 0.0004 | SNX4 | 0.66 | 0.0261 | C6orf62 | -1.06 | 0.0385 |
| IFITM2 | 1.18 | 0.0010 | CHST5 | 0.66 | 0.0275 | HMGCS1 | -1.06 | 0.0016 |
| PECAM1 | 1.18 | 0.0123 | SMCHD1 | 0.66 | 0.0106 | SOX2 | -1.06 | 0.0001 |
| BCL2L14 | 1.18 | 0.0006 | MORC2 | 0.66 | 0.0008 | ALDH7A1 | -1.06 | 0.0002 |
| MST1R | 1.18 | 0.0002 | AKR1B1 | 0.66 | 0.0362 | HRASLS | -1.07 | 0.0000 |
| DTX4 | 1.18 | 0.0003 | PLOD1 | 0.66 | 0.0047 | LAD1 | -1.07 | 0.0137 |
| PSME2 | 1.18 | 0.0000 | C5AR1 | 0.66 | 0.0340 | CLIP1 | -1.07 | 0.0085 |

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|----------|------|--------|----------|------|--------|---------|-------|--------|
| SMS | 1.18 | 0.0014 | NR0B2 | 0.66 | 0.0199 | SH3GLB2 | -1.07 | 0.0001 |
| GPR35 | 1.18 | 0.0001 | PVRL2 | 0.66 | 0.0004 | COBLL1 | -1.08 | 0.0045 |
| PHYH | 1.17 | 0.0164 | GMPPA | 0.66 | 0.0002 | TYRO3 | -1.08 | 0.0001 |
| SLC39A4 | 1.17 | 0.0003 | LTB | 0.66 | 0.0185 | CYB5R1 | -1.08 | 0.0003 |
| LIMA1 | 1.17 | 0.0004 | TMSB10 | 0.66 | 0.0001 | FAM127A | -1.08 | 0.0000 |
| PPARG | 1.17 | 0.0032 | JRKL | 0.65 | 0.0006 | SLK | -1.08 | 0.0202 |
| TGOLN2 | 1.17 | 0.0000 | CENPF | 0.65 | 0.0036 | NTRK2 | -1.08 | 0.0039 |
| ARMCX3 | 1.17 | 0.0019 | GMFG | 0.65 | 0.0353 | NOD2 | -1.08 | 0.0045 |
| GIN51 | 1.17 | 0.0021 | CYP51A1 | 0.65 | 0.0427 | CBR1 | -1.08 | 0.0000 |
| OASL | 1.16 | 0.0072 | TRIM27 | 0.65 | 0.0011 | MGLL | -1.08 | 0.0037 |
| TFPI | 1.16 | 0.0022 | TMEM106C | 0.65 | 0.0162 | PLD1 | -1.09 | 0.0002 |
| LGALS3BP | 1.16 | 0.0000 | FAM111A | 0.65 | 0.0000 | DCTN3 | -1.09 | 0.0000 |
| TRA2A | 1.16 | 0.0108 | HMBS | 0.65 | 0.0021 | CAST | -1.09 | 0.0122 |
| MBD4 | 1.16 | 0.0024 | LCP2 | 0.65 | 0.0053 | CAMSAP1 | -1.09 | 0.0000 |
| CHN2 | 1.15 | 0.0061 | BAX | 0.65 | 0.0025 | AGFG2 | -1.09 | 0.0003 |
| ZC3H7B | 1.15 | 0.0001 | STAB1 | 0.65 | 0.0255 | UBE2D3 | -1.09 | 0.0000 |
| CFTR | 1.15 | 0.0035 | HMHA1 | 0.65 | 0.0151 | TOLLIP | -1.09 | 0.0017 |
| CD14 | 1.15 | 0.0096 | MTRR | 0.65 | 0.0277 | PTPN13 | -1.09 | 0.0061 |
| SFRP4 | 1.15 | 0.0382 | ALMS1 | 0.65 | 0.0014 | ABLIM1 | -1.10 | 0.0013 |
| SERPING1 | 1.15 | 0.0471 | PTPN18 | 0.65 | 0.0001 | SHROOM2 | -1.10 | 0.0005 |
| MINPP1 | 1.15 | 0.0000 | IVD | 0.65 | 0.0223 | ARL4D | -1.10 | 0.0001 |
| AKAP1 | 1.15 | 0.0016 | LGR5 | 0.65 | 0.0372 | ABI1 | -1.10 | 0.0104 |

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|----------|------|--------|----------|------|--------|---------|-------|--------|
| UBE2C | 1.15 | 0.0013 | AIF1 | 0.65 | 0.0020 | TRIM13 | -1.10 | 0.0000 |
| SULT1A2 | 1.15 | 0.0011 | MZT2B | 0.65 | 0.0065 | EIF5A | -1.10 | 0.0387 |
| NQO1 | 1.15 | 0.0116 | CCT2 | 0.65 | 0.0401 | CSDA | -1.10 | 0.0002 |
| GTSE1 | 1.15 | 0.0001 | PADI2 | 0.65 | 0.0183 | C14orf1 | -1.10 | 0.0005 |
| HSP90B1 | 1.15 | 0.0023 | NEU1 | 0.65 | 0.0183 | UBE2H | -1.11 | 0.0003 |
| PLVAP | 1.15 | 0.0008 | GMPS | 0.65 | 0.0001 | SLC12A6 | -1.11 | 0.0000 |
| C20orf20 | 1.14 | 0.0003 | POMZP3 | 0.65 | 0.0276 | FBXO3 | -1.11 | 0.0039 |
| CD302 | 1.14 | 0.0226 | PARN | 0.65 | 0.0004 | CYP4F3 | -1.11 | 0.0062 |
| C4BPB | 1.14 | 0.0023 | PTPRN2 | 0.64 | 0.0189 | LPHN2 | -1.11 | 0.0020 |
| HCP5 | 1.14 | 0.0007 | CARS | 0.64 | 0.0005 | HK1 | -1.11 | 0.0000 |
| PLCL2 | 1.14 | 0.0001 | KIF18B | 0.64 | 0.0194 | PLIN3 | -1.12 | 0.0044 |
| HLA-DRA | 1.14 | 0.0058 | ACLY | 0.64 | 0.0003 | SMAGP | -1.12 | 0.0235 |
| NUSAP1 | 1.14 | 0.0035 | GBAP1 | 0.64 | 0.0049 | ITCH | -1.12 | 0.0022 |
| NT5E | 1.13 | 0.0025 | PTPLAD1 | 0.64 | 0.0070 | SRD5A1 | -1.12 | 0.0048 |
| C4orf19 | 1.13 | 0.0042 | ENY2 | 0.64 | 0.0051 | TWF1 | -1.13 | 0.0378 |
| FUCA1 | 1.13 | 0.0005 | TMEM185B | 0.64 | 0.0029 | FAM63A | -1.13 | 0.0000 |
| ATR | 1.13 | 0.0001 | ZNF22 | 0.64 | 0.0086 | WNT5A | -1.13 | 0.0203 |
| MRPS35 | 1.13 | 0.0008 | MRP63 | 0.64 | 0.0002 | ABHD5 | -1.13 | 0.0023 |
| CD2AP | 1.13 | 0.0127 | TES | 0.64 | 0.0365 | NFE2L2 | -1.13 | 0.0096 |
| FAM134B | 1.13 | 0.0018 | EBNA1BP2 | 0.64 | 0.0016 | MAF | -1.13 | 0.0004 |
| MTMR11 | 1.12 | 0.0001 | H2AFX | 0.64 | 0.0123 | PCYOX1 | -1.13 | 0.0209 |
| WIPF1 | 1.12 | 0.0097 | NFATC2IP | 0.64 | 0.0116 | H2AFY | -1.13 | 0.0004 |

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|----------|------|--------|---------|------|--------|----------|-------|--------|
| TGM2 | 1.12 | 0.0089 | TMC6 | 0.64 | 0.0070 | EPHA1 | -1.14 | 0.0072 |
| LPIN2 | 1.12 | 0.0005 | DUSP8 | 0.64 | 0.0031 | PDZRN3 | -1.14 | 0.0425 |
| IL2RG | 1.12 | 0.0004 | ZNF165 | 0.64 | 0.0140 | TP53AIP1 | -1.14 | 0.0000 |
| HLA-DPA1 | 1.12 | 0.0042 | SDF2L1 | 0.64 | 0.0004 | USP46 | -1.14 | 0.0020 |
| IFITM3 | 1.12 | 0.0003 | XBP1 | 0.64 | 0.0087 | RHOD | -1.14 | 0.0034 |
| ROCK2 | 1.12 | 0.0061 | LHFPL2 | 0.64 | 0.0040 | BDH1 | -1.14 | 0.0011 |
| NFKBIE | 1.12 | 0.0000 | IL27RA | 0.64 | 0.0049 | SH3GL1 | -1.14 | 0.0001 |
| NEDD9 | 1.12 | 0.0012 | TDG | 0.64 | 0.0486 | ELL2 | -1.15 | 0.0034 |
| HLA-DMB | 1.12 | 0.0001 | GLT25D1 | 0.64 | 0.0003 | TRPS1 | -1.15 | 0.0048 |
| UBE2L6 | 1.11 | 0.0001 | NCF4 | 0.63 | 0.0253 | RBFOX2 | -1.15 | 0.0000 |
| C1QA | 1.11 | 0.0021 | ANP32B | 0.63 | 0.0074 | ARF6 | -1.15 | 0.0014 |
| FCGRT | 1.11 | 0.0004 | FCGR1B | 0.63 | 0.0068 | ALDH9A1 | -1.15 | 0.0001 |
| C1R | 1.11 | 0.0280 | SNRPG | 0.63 | 0.0001 | CMAS | -1.15 | 0.0031 |
| NEK3 | 1.11 | 0.0003 | TGIF2 | 0.63 | 0.0109 | KLF4 | -1.15 | 0.0070 |
| PDIA5 | 1.11 | 0.0000 | DDX10 | 0.63 | 0.0003 | MBD2 | -1.16 | 0.0012 |
| RPN2 | 1.10 | 0.0001 | KIF14 | 0.63 | 0.0000 | GSN | -1.16 | 0.0068 |
| AHR | 1.10 | 0.0011 | EDEM2 | 0.63 | 0.0000 | FGFR3 | -1.16 | 0.0161 |
| WBSCR22 | 1.10 | 0.0000 | ABCE1 | 0.63 | 0.0429 | NUCB2 | -1.16 | 0.0352 |
| PON2 | 1.10 | 0.0008 | RUVBL1 | 0.63 | 0.0000 | RIPK4 | -1.17 | 0.0166 |
| HSPD1 | 1.10 | 0.0003 | SF3A2 | 0.63 | 0.0013 | SKP1 | -1.18 | 0.0001 |
| HLA-C | 1.09 | 0.0000 | LEPRE1 | 0.63 | 0.0041 | PTGS1 | -1.18 | 0.0014 |
| TPR | 1.09 | 0.0043 | NSUN5 | 0.63 | 0.0032 | GLUD2 | -1.18 | 0.0002 |

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|----------|------|--------|----------|------|--------|----------|-------|--------|
| ZWINT | 1.09 | 0.0078 | GLB1L2 | 0.63 | 0.0014 | CERS4 | -1.18 | 0.0000 |
| KDELR2 | 1.09 | 0.0003 | SPTAN1 | 0.63 | 0.0016 | DKK1 | -1.18 | 0.0452 |
| GFPT1 | 1.09 | 0.0021 | HEATR1 | 0.63 | 0.0010 | P2RY2 | -1.18 | 0.0027 |
| TBL2 | 1.09 | 0.0000 | TMF1 | 0.63 | 0.0017 | HSPA4L | -1.18 | 0.0041 |
| PPAP2C | 1.09 | 0.0060 | P4HTM | 0.63 | 0.0023 | AKTIP | -1.19 | 0.0001 |
| IGLV3-21 | 1.08 | 0.0294 | UFM1 | 0.63 | 0.0131 | RBP1 | -1.19 | 0.0092 |
| DBT | 1.08 | 0.0005 | MICU1 | 0.63 | 0.0019 | SLC16A6 | -1.19 | 0.0016 |
| PDE4DIP | 1.08 | 0.0000 | RBM28 | 0.63 | 0.0001 | HPSE | -1.19 | 0.0220 |
| ADAP1 | 1.08 | 0.0005 | C19orf66 | 0.63 | 0.0007 | SLC39A2 | -1.19 | 0.0004 |
| PODXL | 1.08 | 0.0003 | CHSY1 | 0.63 | 0.0360 | PTPRZ1 | -1.20 | 0.0107 |
| FGFR4 | 1.08 | 0.0005 | MOGS | 0.63 | 0.0005 | WDR1 | -1.20 | 0.0003 |
| P2RX4 | 1.08 | 0.0001 | ACSL4 | 0.62 | 0.0127 | BCL11A | -1.20 | 0.0002 |
| ZFP36L2 | 1.08 | 0.0028 | ISG20 | 0.62 | 0.0351 | SERPINB1 | -1.20 | 0.0372 |
| DAP | 1.08 | 0.0001 | PPT1 | 0.62 | 0.0284 | SAMD9 | -1.21 | 0.0465 |
| APMAP | 1.07 | 0.0000 | TCF3 | 0.62 | 0.0001 | WNK1 | -1.21 | 0.0000 |
| DBF4 | 1.07 | 0.0001 | COL18A1 | 0.62 | 0.0273 | NPEPPS | -1.21 | 0.0005 |
| ITGB1 | 1.07 | 0.0026 | CCT3 | 0.62 | 0.0002 | CLTB | -1.21 | 0.0003 |
| PVRL3 | 1.07 | 0.0005 | FANCF | 0.62 | 0.0010 | BLNK | -1.22 | 0.0467 |
| THY1 | 1.07 | 0.0126 | ZNF195 | 0.62 | 0.0086 | ALDH4A1 | -1.23 | 0.0000 |
| GOLIM4 | 1.07 | 0.0075 | RTN3 | 0.62 | 0.0042 | CPA4 | -1.23 | 0.0001 |
| GCA | 1.07 | 0.0003 | HERC5 | 0.62 | 0.0231 | GPR110 | -1.23 | 0.0004 |
| MCM6 | 1.07 | 0.0002 | HFE | 0.62 | 0.0020 | WASF2 | -1.23 | 0.0000 |

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|---------|------|--------|-----------|------|--------|----------|-------|--------|
| HOXB6 | 1.07 | 0.0010 | RFX5 | 0.62 | 0.0183 | BAG3 | -1.23 | 0.0000 |
| SEMA4G | 1.07 | 0.0001 | PROSAPIP1 | 0.62 | 0.0008 | CYP2E1 | -1.23 | 0.0060 |
| USP34 | 1.07 | 0.0000 | ZNF146 | 0.62 | 0.0299 | RMND5B | -1.23 | 0.0000 |
| TNFAIP6 | 1.07 | 0.0125 | TOPBP1 | 0.62 | 0.0074 | RABGGTA | -1.23 | 0.0018 |
| ITGAV | 1.07 | 0.0199 | TGS1 | 0.62 | 0.0020 | TFAP2C | -1.23 | 0.0024 |
| PHLDA2 | 1.07 | 0.0413 | PMEPA1 | 0.62 | 0.0200 | RYR1 | -1.23 | 0.0005 |
| IQCK | 1.07 | 0.0004 | VWA1 | 0.62 | 0.0313 | ADH1B | -1.24 | 0.0256 |
| TRAF5 | 1.06 | 0.0011 | MYH14 | 0.62 | 0.0485 | YWHAZ | -1.24 | 0.0013 |
| USH1C | 1.06 | 0.0055 | STK10 | 0.62 | 0.0019 | TTC22 | -1.24 | 0.0003 |
| FYN | 1.06 | 0.0030 | ENPP4 | 0.62 | 0.0332 | DNASE1L3 | -1.24 | 0.0044 |
| PRKRIR | 1.06 | 0.0008 | THEMIS2 | 0.62 | 0.0333 | ZNF426 | -1.24 | 0.0017 |
| GPRC5C | 1.06 | 0.0000 | SNX10 | 0.62 | 0.0000 | TP53I3 | -1.24 | 0.0125 |
| PPM1H | 1.05 | 0.0000 | ALG13 | 0.62 | 0.0125 | NCK1 | -1.24 | 0.0033 |
| GUSB | 1.05 | 0.0000 | MGRN1 | 0.62 | 0.0008 | SPTLC1 | -1.25 | 0.0009 |
| LMNB1 | 1.05 | 0.0014 | CTSD | 0.62 | 0.0004 | VAMP3 | -1.25 | 0.0002 |
| ENPP2 | 1.05 | 0.0260 | NOC3L | 0.62 | 0.0190 | KRT33A | -1.25 | 0.0000 |
| PAPSS2 | 1.05 | 0.0136 | APLP2 | 0.62 | 0.0137 | BMP7 | -1.25 | 0.0001 |
| IDO1 | 1.05 | 0.0078 | CD47 | 0.62 | 0.0057 | EPS8L2 | -1.25 | 0.0070 |
| COX11 | 1.05 | 0.0178 | SOAT1 | 0.62 | 0.0000 | DUSP7 | -1.26 | 0.0018 |
| NDC80 | 1.05 | 0.0009 | VPS13A | 0.61 | 0.0026 | PIR | -1.26 | 0.0002 |
| TMEM135 | 1.05 | 0.0081 | B2M | 0.61 | 0.0002 | ZSCAN18 | -1.26 | 0.0072 |
| GMNN | 1.04 | 0.0021 | DIP2A | 0.61 | 0.0017 | EPHX1 | -1.26 | 0.0001 |

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|----------|------|--------|-----------------|------|--------|---------|-------|--------|
| ADAR | 1.04 | 0.0000 | CDCA8 | 0.61 | 0.0041 | FAM162A | -1.26 | 0.0001 |
| TRAF4 | 1.04 | 0.0004 | HNRNPL | 0.61 | 0.0057 | ARNTL2 | -1.26 | 0.0154 |
| DLGAP5 | 1.04 | 0.0001 | ICAM2 | 0.61 | 0.0318 | NLRX1 | -1.26 | 0.0000 |
| ENTPD6 | 1.04 | 0.0000 | BTN2A1 | 0.61 | 0.0019 | HOMER2 | -1.26 | 0.0006 |
| KCTD14 | 1.04 | 0.0012 | PLCE1 | 0.61 | 0.0170 | DNAJB6 | -1.26 | 0.0003 |
| TPX2 | 1.04 | 0.0007 | CYCS | 0.61 | 0.0406 | HEBP2 | -1.26 | 0.0000 |
| PGF | 1.04 | 0.0001 | UBE4A | 0.61 | 0.0296 | FUT3 | -1.26 | 0.0132 |
| PBLD | 1.04 | 0.0475 | C12orf44 | 0.61 | 0.0009 | TJP1 | -1.27 | 0.0004 |
| ATIC | 1.03 | 0.0000 | PLEKHA5 | 0.61 | 0.0014 | ALOX15B | -1.27 | 0.0040 |
| C11orf24 | 1.03 | 0.0001 | OSBPL9 | 0.61 | 0.0214 | RND3 | -1.28 | 0.0026 |
| PPFIBP1 | 1.03 | 0.0006 | APLNR | 0.61 | 0.0485 | PIM1 | -1.28 | 0.0022 |
| MGAT2 | 1.03 | 0.0029 | TSPAN31 | 0.61 | 0.0370 | CELSR2 | -1.28 | 0.0002 |
| ICA1 | 1.03 | 0.0001 | MRPS31 | 0.61 | 0.0233 | ZNF512B | -1.28 | 0.0001 |
| ST6GAL1 | 1.03 | 0.0114 | ANKRD10- IT1 | 0.61 | 0.0002 | FUT6 | -1.28 | 0.0119 |
| C3orf52 | 1.03 | 0.0079 | LIPA | 0.61 | 0.0280 | PAK6 | -1.29 | 0.0015 |
| CTBP2 | 1.03 | 0.0098 | NAB1 | 0.61 | 0.0215 | PMM1 | -1.29 | 0.0002 |
| BIN1 | 1.03 | 0.0001 | SUMO1 | 0.61 | 0.0169 | WDR26 | -1.29 | 0.0002 |
| NFE2L3 | 1.03 | 0.0004 | PYCRL | 0.61 | 0.0138 | NT5DC2 | -1.29 | 0.0004 |
| DDX39A | 1.03 | 0.0002 | IL15RA | 0.61 | 0.0002 | GM2A | -1.30 | 0.0125 |
| ZNF160 | 1.03 | 0.0001 | ATF5 | 0.61 | 0.0010 | DNAJB1 | -1.30 | 0.0034 |
| GNAS | 1.03 | 0.0097 | PPP3CA | 0.61 | 0.0149 | NSG1 | -1.31 | 0.0002 |

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|----------|------|--------|----------|------|--------|---------|-------|--------|
| PDE4A | 1.03 | 0.0006 | ATXN7L3B | 0.61 | 0.0015 | KAT2B | -1.31 | 0.0043 |
| PIIG | 1.02 | 0.0134 | MAGOH | 0.61 | 0.0010 | TM7SF2 | -1.32 | 0.0003 |
| CDC14B | 1.02 | 0.0022 | SETD5 | 0.61 | 0.0061 | ARHGEF4 | -1.34 | 0.0001 |
| CCT6A | 1.02 | 0.0011 | ASRGL1 | 0.61 | 0.0182 | NDRG4 | -1.34 | 0.0002 |
| CNOT2 | 1.02 | 0.0047 | CACYBP | 0.61 | 0.0235 | CDK5R1 | -1.35 | 0.0002 |
| INPP4B | 1.02 | 0.0007 | KBTBD11 | 0.61 | 0.0290 | SYPL1 | -1.35 | 0.0003 |
| MYO10 | 1.02 | 0.0002 | RELB | 0.61 | 0.0015 | ADK | -1.35 | 0.0001 |
| KIF4A | 1.02 | 0.0001 | ZNF239 | 0.61 | 0.0014 | DOCK9 | -1.35 | 0.0008 |
| STAG2 | 1.02 | 0.0169 | HDGF | 0.61 | 0.0012 | MTSS1 | -1.35 | 0.0003 |
| RTP4 | 1.02 | 0.0000 | RNFT2 | 0.61 | 0.0158 | EPS8L1 | -1.35 | 0.0149 |
| PLAU | 1.02 | 0.0231 | BICD1 | 0.61 | 0.0013 | NMRK1 | -1.36 | 0.0016 |
| HLA-DQB1 | 1.01 | 0.0051 | ALG8 | 0.61 | 0.0001 | SRPX2 | -1.36 | 0.0026 |
| SLC12A2 | 1.01 | 0.0036 | ANP32A | 0.61 | 0.0124 | JMJD7 | -1.36 | 0.0001 |
| SLAMF8 | 1.01 | 0.0032 | COQ10B | 0.61 | 0.0390 | BLVRA | -1.37 | 0.0000 |
| RFC4 | 1.01 | 0.0001 | AARS | 0.61 | 0.0066 | ULBP2 | -1.38 | 0.0019 |
| RAMP1 | 1.01 | 0.0182 | SEC23B | 0.61 | 0.0189 | RAB5A | -1.38 | 0.0006 |
| ELF4 | 1.01 | 0.0000 | USP7 | 0.60 | 0.0341 | MYCL1 | -1.38 | 0.0010 |
| ITGB4 | 1.01 | 0.0001 | SAV1 | 0.60 | 0.0355 | GSTA4 | -1.39 | 0.0005 |
| APP | 1.01 | 0.0047 | LLGL2 | 0.60 | 0.0394 | CRIP2 | -1.40 | 0.0002 |
| TCF7L2 | 1.01 | 0.0066 | GZMB | 0.60 | 0.0251 | RASAL1 | -1.40 | 0.0005 |
| TYROBP | 1.01 | 0.0129 | CDK14 | 0.60 | 0.0450 | TMOD3 | -1.40 | 0.0064 |
| NUP107 | 1.01 | 0.0058 | IFT57 | 0.60 | 0.0316 | CXCR2 | -1.40 | 0.0023 |

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|----------|------|--------|---------|------|--------|----------|-------|--------|
| ZNF148 | 1.01 | 0.0022 | UVRAG | 0.60 | 0.0123 | OSTF1 | -1.41 | 0.0001 |
| LGALS9 | 1.00 | 0.0001 | ARFGAP1 | 0.60 | 0.0006 | PALMD | -1.41 | 0.0003 |
| NUP43 | 1.00 | 0.0015 | BORA | 0.60 | 0.0012 | RAPGEFL1 | -1.41 | 0.0024 |
| RAB17 | 1.00 | 0.0004 | PPIB | 0.60 | 0.0018 | C18orf25 | -1.41 | 0.0004 |
| PKP2 | 1.00 | 0.0266 | GINS2 | 0.60 | 0.0271 | CLDND1 | -1.41 | 0.0045 |
| SERPINE1 | 1.00 | 0.0099 | TRIP13 | 0.60 | 0.0010 | PYGL | -1.42 | 0.0025 |
| RFK | 1.00 | 0.0179 | SPATA20 | 0.60 | 0.0313 | MT1X | -1.42 | 0.0019 |
| MAD2L1 | 1.00 | 0.0003 | ZNHIT1 | 0.60 | 0.0003 | TMEM40 | -1.42 | 0.0012 |
| PTK2 | 1.00 | 0.0022 | DSN1 | 0.60 | 0.0007 | CFD | -1.43 | 0.0184 |
| LRRC8D | 1.00 | 0.0000 | PROSC | 0.60 | 0.0094 | PTK6 | -1.43 | 0.0159 |
| HTRA1 | 1.00 | 0.0105 | SUPT16H | 0.60 | 0.0016 | MAP3K9 | -1.44 | 0.0028 |
| FEN1 | 1.00 | 0.0000 | GLB1 | 0.60 | 0.0070 | RASAL2 | -1.44 | 0.0005 |
| BUB1B | 1.00 | 0.0001 | CCL4 | 0.60 | 0.0318 | ALDH3A2 | -1.44 | 0.0020 |
| BHLHE41 | 1.00 | 0.0449 | IL15 | 0.60 | 0.0065 | PHLDA1 | -1.44 | 0.0089 |
| HNMT | 1.00 | 0.0120 | MAT2A | 0.60 | 0.0001 | ESPL1 | -1.45 | 0.0030 |
| LAMB1 | 0.99 | 0.0321 | CELSR3 | 0.60 | 0.0042 | CALML5 | -1.46 | 0.0002 |
| GMDS | 0.99 | 0.0210 | SMAD6 | 0.59 | 0.0019 | ARG2 | -1.46 | 0.0097 |
| NSL1 | 0.99 | 0.0018 | S100A6 | 0.59 | 0.0001 | IER5 | -1.46 | 0.0015 |
| EPHB2 | 0.99 | 0.0003 | CENPA | 0.59 | 0.0097 | ZNF365 | -1.47 | 0.0029 |
| SLC25A37 | 0.99 | 0.0001 | TTC13 | 0.59 | 0.0002 | GJA1 | -1.47 | 0.0067 |
| TMEM123 | 0.99 | 0.0227 | HDAC1 | 0.59 | 0.0008 | TSPAN6 | -1.47 | 0.0114 |
| NR1H3 | 0.99 | 0.0006 | NKTR | 0.59 | 0.0208 | PPP1R13L | -1.47 | 0.0012 |

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|----------|------|--------|----------|-------|--------|---------|-------|--------|
| TPD52 | 0.99 | 0.0202 | BET1 | 0.59 | 0.0299 | SASH1 | -1.47 | 0.0000 |
| YWHAH | 0.99 | 0.0017 | GMIP | 0.59 | 0.0009 | HILPDA | -1.48 | 0.0248 |
| CTSC | 0.99 | 0.0055 | DAZAP2 | 0.59 | 0.0017 | NEBL | -1.48 | 0.0132 |
| GLS | 0.99 | 0.0097 | CCPG1 | 0.59 | 0.0188 | C3orf14 | -1.48 | 0.0007 |
| SCRN1 | 0.99 | 0.0105 | ZMYM2 | 0.59 | 0.0403 | TECR | -1.48 | 0.0022 |
| ZNF587 | 0.99 | 0.0000 | KIAA1551 | 0.59 | 0.0130 | GDPD3 | -1.48 | 0.0039 |
| TNFRSF21 | 0.99 | 0.0005 | AGFG1 | 0.59 | 0.0007 | ECHDC3 | -1.48 | 0.0008 |
| SLC39A8 | 0.99 | 0.0008 | CREBZF | 0.59 | 0.0034 | PDCD4 | -1.49 | 0.0041 |
| CD164 | 0.99 | 0.0250 | MSANTD2 | 0.59 | 0.0022 | MREG | -1.49 | 0.0116 |
| SCCPDH | 0.98 | 0.0002 | ZNF587B | 0.59 | 0.0001 | EYA2 | -1.50 | 0.0002 |
| MAN1A1 | 0.98 | 0.0177 | NANS | 0.59 | 0.0166 | GALNT14 | -1.50 | 0.0003 |
| TNFRSF14 | 0.98 | 0.0001 | C18orf8 | 0.59 | 0.0160 | S100A14 | -1.50 | 0.0304 |
| KIAA0101 | 0.98 | 0.0001 | TOX4 | -0.59 | 0.0000 | EMP2 | -1.50 | 0.0003 |
| ANKRD10 | 0.98 | 0.0017 | ARNTL | -0.59 | 0.0023 | RIT1 | -1.53 | 0.0004 |
| GCC2 | 0.98 | 0.0244 | COQ4 | -0.59 | 0.0176 | SOX15 | -1.53 | 0.0001 |
| ICAM1 | 0.98 | 0.0021 | SBF1 | -0.59 | 0.0003 | SHMT1 | -1.54 | 0.0003 |
| SERP1 | 0.98 | 0.0035 | PHKB | -0.59 | 0.0225 | VAV3 | -1.54 | 0.0027 |
| SLC7A11 | 0.98 | 0.0363 | ARF3 | -0.59 | 0.0018 | ACPP | -1.54 | 0.0038 |
| CXCL9 | 0.98 | 0.0019 | HOXB2 | -0.59 | 0.0238 | EFS | -1.54 | 0.0000 |
| SNRPB2 | 0.98 | 0.0003 | TSPAN14 | -0.59 | 0.0042 | SFN | -1.55 | 0.0418 |
| HGD | 0.98 | 0.0338 | BZW1 | -0.59 | 0.0277 | WNT4 | -1.55 | 0.0003 |
| RPS27L | 0.97 | 0.0022 | FH | -0.59 | 0.0007 | RRAD | -1.56 | 0.0011 |

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|----------|------|--------|------------|-------|--------|----------|-------|--------|
| EFNA1 | 0.97 | 0.0001 | NDUFS4 | -0.59 | 0.0233 | EPB41L3 | -1.56 | 0.0043 |
| CCDC68 | 0.97 | 0.0289 | DEDD | -0.59 | 0.0009 | DSC2 | -1.57 | 0.0301 |
| HMGB2 | 0.97 | 0.0182 | FBXW11 | -0.59 | 0.0007 | VLDLR | -1.57 | 0.0000 |
| MMP11 | 0.97 | 0.0058 | UBE2K | -0.59 | 0.0011 | ENO1 | -1.58 | 0.0002 |
| SLC25A32 | 0.97 | 0.0032 | TGFA | -0.59 | 0.0176 | ZFYVE21 | -1.59 | 0.0000 |
| TTF1 | 0.97 | 0.0087 | COQ9 | -0.59 | 0.0036 | GLUL | -1.59 | 0.0007 |
| UGT8 | 0.97 | 0.0000 | ETF1 | -0.59 | 0.0074 | RORA | -1.59 | 0.0002 |
| PLEK2 | 0.97 | 0.0003 | PLXNA2 | -0.59 | 0.0068 | NAGK | -1.61 | 0.0001 |
| FTL | 0.97 | 0.0000 | DYNLL1 | -0.60 | 0.0025 | CD207 | -1.61 | 0.0000 |
| MYO1B | 0.97 | 0.0101 | STAU2 | -0.60 | 0.0120 | HLF | -1.62 | 0.0047 |
| IFNGR1 | 0.97 | 0.0188 | C19orf6 | -0.60 | 0.0005 | C1orf116 | -1.62 | 0.0009 |
| GARS | 0.97 | 0.0000 | PHLDA3 | -0.60 | 0.0102 | UBE2G1 | -1.62 | 0.0000 |
| TERF1 | 0.97 | 0.0031 | GAB1 | -0.60 | 0.0000 | CSRP2 | -1.63 | 0.0002 |
| GCNT1 | 0.96 | 0.0038 | BTF3 | -0.60 | 0.0092 | KLK10 | -1.64 | 0.0178 |
| ATP2A3 | 0.96 | 0.0007 | SLC25A12 | -0.60 | 0.0233 | PERP | -1.65 | 0.0007 |
| PPFIA1 | 0.96 | 0.0048 | MAOA | -0.60 | 0.0221 | OBFC1 | -1.66 | 0.0000 |
| RAD21 | 0.96 | 0.0116 | CHFR | -0.60 | 0.0051 | UPK3B | -1.66 | 0.0060 |
| PLXNC1 | 0.96 | 0.0058 | LRRFIP2 | -0.60 | 0.0023 | CSTB | -1.67 | 0.0015 |
| ADAM10 | 0.96 | 0.0128 | NCRNA00185 | -0.60 | 0.0069 | GYS2 | -1.68 | 0.0008 |
| LITAF | 0.96 | 0.0026 | UNC13B | -0.60 | 0.0017 | ZFAND5 | -1.68 | 0.0000 |
| RBPJ | 0.96 | 0.0018 | REXO2 | -0.60 | 0.0161 | CA12 | -1.69 | 0.0028 |
| SSFA2 | 0.96 | 0.0042 | SFRP1 | -0.60 | 0.0061 | SUSD4 | -1.69 | 0.0000 |

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|----------|------|--------|----------|-------|--------|--------|-------|--------|
| SLC19A1 | 0.96 | 0.0003 | MAPKAPK3 | -0.60 | 0.0088 | TRIM16 | -1.69 | 0.0005 |
| FAM83E | 0.96 | 0.0053 | FANCE | -0.60 | 0.0011 | DUOX1 | -1.69 | 0.0028 |
| LRRFIP1 | 0.95 | 0.0013 | ARSF | -0.60 | 0.0002 | TF | -1.70 | 0.0123 |
| TPK1 | 0.95 | 0.0063 | PKM | -0.60 | 0.0337 | PDZD2 | -1.71 | 0.0000 |
| XK | 0.95 | 0.0334 | N4BP3 | -0.60 | 0.0000 | SYNGR1 | -1.71 | 0.0000 |
| IVNS1ABP | 0.95 | 0.0053 | RPL3 | -0.60 | 0.0013 | TIAM1 | -1.72 | 0.0003 |
| BIRC2 | 0.95 | 0.0032 | TSC22D3 | -0.60 | 0.0248 | DEFB1 | -1.74 | 0.0102 |
| KPNA2 | 0.95 | 0.0002 | ACOX2 | -0.60 | 0.0058 | AHNAK | -1.76 | 0.0001 |
| EGR3 | 0.95 | 0.0425 | HIPK3 | -0.60 | 0.0058 | MPZL2 | -1.77 | 0.0069 |
| POLD3 | 0.95 | 0.0000 | KIAA0247 | -0.60 | 0.0017 | ANXA9 | -1.77 | 0.0007 |
| PLA1A | 0.95 | 0.0079 | LIMK2 | -0.61 | 0.0169 | RNF141 | -1.78 | 0.0001 |
| TNIK | 0.95 | 0.0057 | DEF8 | -0.61 | 0.0042 | IMPA2 | -1.78 | 0.0002 |
| ATHL1 | 0.95 | 0.0030 | SRSF5 | -0.61 | 0.0029 | FCER1A | -1.78 | 0.0000 |
| GPR137B | 0.95 | 0.0002 | MGST2 | -0.61 | 0.0204 | BICD2 | -1.78 | 0.0000 |
| TAF2 | 0.95 | 0.0080 | PTBP3 | -0.61 | 0.0208 | CD9 | -1.79 | 0.0001 |
| BMI1 | 0.95 | 0.0198 | FETUB | -0.61 | 0.0001 | IL36A | -1.81 | 0.0003 |
| NADK | 0.95 | 0.0001 | SRR | -0.61 | 0.0028 | VSNL1 | -1.81 | 0.0008 |
| MICAL1 | 0.94 | 0.0002 | PPP2R5C | -0.61 | 0.0017 | HSPB1 | -1.82 | 0.0003 |
| ANKMY2 | 0.94 | 0.0064 | DLEU1 | -0.61 | 0.0017 | TTC9 | -1.82 | 0.0006 |
| HLA-DRB6 | 0.94 | 0.0010 | ARL8B | -0.61 | 0.0124 | AIM1L | -1.83 | 0.0032 |
| GSDMD | 0.94 | 0.0001 | EHBP1 | -0.61 | 0.0473 | CNN3 | -1.84 | 0.0001 |
| HCLS1 | 0.94 | 0.0235 | UBE2I | -0.61 | 0.0001 | MAFB | -1.85 | 0.0008 |

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|----------|------|--------|-----------|-------|--------|-----------|-------|--------|
| CASP8 | 0.94 | 0.0073 | EIF4ENIF1 | -0.61 | 0.0026 | CITED2 | -1.85 | 0.0017 |
| SLC12A7 | 0.94 | 0.0000 | TOR1AIP1 | -0.61 | 0.0160 | FZD10 | -1.87 | 0.0008 |
| ERAP1 | 0.94 | 0.0054 | OGFRL1 | -0.61 | 0.0018 | DGKA | -1.88 | 0.0002 |
| ZNF238 | 0.94 | 0.0220 | IDH2 | -0.61 | 0.0207 | C2orf54 | -1.89 | 0.0001 |
| SLC33A1 | 0.94 | 0.0091 | DALRD3 | -0.61 | 0.0024 | DSG1 | -1.90 | 0.0096 |
| SLC25A13 | 0.94 | 0.0004 | SLC7A8 | -0.61 | 0.0001 | FAT2 | -1.90 | 0.0003 |
| BASP1 | 0.94 | 0.0165 | GDI2 | -0.61 | 0.0320 | NDRG2 | -1.90 | 0.0000 |
| URI1 | 0.94 | 0.0019 | C16orf62 | -0.61 | 0.0014 | PKP3 | -1.92 | 0.0013 |
| MS4A4A | 0.94 | 0.0215 | TMEM43 | -0.62 | 0.0098 | CBR3 | -1.93 | 0.0001 |
| ADD3 | 0.94 | 0.0166 | UBE2D2 | -0.62 | 0.0001 | LY6G6C | -1.94 | 0.0024 |
| CHKA | 0.94 | 0.0001 | ACAA1 | -0.62 | 0.0048 | EVPL | -1.94 | 0.0006 |
| PRR13 | 0.94 | 0.0002 | GID4 | -0.62 | 0.0002 | PCP4 | -1.94 | 0.0103 |
| CSE1L | 0.94 | 0.0036 | PRNP | -0.62 | 0.0111 | GJB5 | -1.95 | 0.0004 |
| LCK | 0.93 | 0.0032 | SLC11A2 | -0.62 | 0.0483 | C10orf116 | -1.96 | 0.0007 |
| SUZ12 | 0.93 | 0.0182 | FEM1B | -0.62 | 0.0245 | RANBP9 | -1.97 | 0.0001 |
| IPO7 | 0.93 | 0.0046 | ARHGEF10L | -0.62 | 0.0010 | DUSP5 | -1.98 | 0.0087 |
| CEP350 | 0.93 | 0.0150 | CIRBP | -0.62 | 0.0058 | KANK1 | -1.98 | 0.0000 |
| TNPO1 | 0.93 | 0.0160 | PHACTR2 | -0.62 | 0.0040 | PTN | -2.00 | 0.0001 |
| C17orf62 | 0.93 | 0.0000 | RGS20 | -0.62 | 0.0224 | RRAGD | -2.02 | 0.0000 |
| CADPS2 | 0.93 | 0.0400 | NCOA2 | -0.62 | 0.0060 | DHRS1 | -2.02 | 0.0011 |
| ASL | 0.93 | 0.0056 | HSD17B8 | -0.63 | 0.0079 | DST | -2.05 | 0.0053 |
| IGLV2-23 | 0.92 | 0.0483 | MINA | -0.63 | 0.0118 | CCNG2 | -2.07 | 0.0005 |

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|----------|------|--------|---------|-------|--------|---------|-------|--------|
| ERLIN2 | 0.92 | 0.0030 | ATP5J | -0.63 | 0.0036 | IL18 | -2.08 | 0.0018 |
| MVP | 0.92 | 0.0003 | PLSCR3 | -0.63 | 0.0021 | RAB38 | -2.10 | 0.0024 |
| IFRD1 | 0.92 | 0.0222 | SMARCA4 | -0.63 | 0.0052 | PGD | -2.11 | 0.0026 |
| TNFRSF1B | 0.92 | 0.0035 | CPPED1 | -0.63 | 0.0052 | BBOX1 | -2.13 | 0.0001 |
| TSPAN15 | 0.92 | 0.0002 | NSFL1C | -0.63 | 0.0001 | BEX4 | -2.13 | 0.0001 |
| DCLRE1C | 0.92 | 0.0003 | SLC7A4 | -0.63 | 0.0035 | CST6 | -2.16 | 0.0044 |
| CDC42BPA | 0.92 | 0.0012 | MED6 | -0.63 | 0.0072 | SLC24A3 | -2.18 | 0.0000 |
| TGIF1 | 0.92 | 0.0004 | KAT6B | -0.63 | 0.0046 | MALL | -2.18 | 0.0038 |
| CYTIP | 0.92 | 0.0037 | TAF9B | -0.63 | 0.0420 | SCNN1B | -2.22 | 0.0002 |
| DPY19L1 | 0.92 | 0.0000 | YWHAQ | -0.63 | 0.0007 | PDLIM2 | -2.22 | 0.0000 |
| VRK1 | 0.92 | 0.0022 | SEC14L1 | -0.63 | 0.0044 | BNIP3 | -2.22 | 0.0000 |
| SLC35A1 | 0.92 | 0.0084 | DENND2A | -0.63 | 0.0450 | NMU | -2.24 | 0.0069 |
| NELF | 0.92 | 0.0001 | CNOT1 | -0.64 | 0.0010 | TP63 | -2.25 | 0.0019 |
| ELTD1 | 0.91 | 0.0050 | IQGAP1 | -0.64 | 0.0140 | TUBB6 | -2.26 | 0.0000 |
| DYRK2 | 0.91 | 0.0179 | SCYL2 | -0.64 | 0.0084 | HSPA2 | -2.28 | 0.0002 |
| OLFML2B | 0.91 | 0.0049 | CIDEB | -0.64 | 0.0024 | KLK12 | -2.29 | 0.0061 |
| RBM39 | 0.91 | 0.0219 | EIF4G1 | -0.64 | 0.0001 | S100A12 | -2.32 | 0.0045 |
| RBBP8 | 0.91 | 0.0044 | SLC6A4 | -0.64 | 0.0006 | UPK1A | -2.32 | 0.0044 |
| RBM15 | 0.91 | 0.0002 | PC | -0.64 | 0.0036 | IL1RN | -2.33 | 0.0048 |
| MFAP2 | 0.91 | 0.0082 | RGS14 | -0.64 | 0.0013 | FABP5 | -2.35 | 0.0010 |
| SOCS1 | 0.91 | 0.0008 | ACYP2 | -0.64 | 0.0023 | ALDH3B2 | -2.36 | 0.0001 |
| HLA-A | 0.91 | 0.0000 | CYFIP1 | -0.64 | 0.0009 | CWH43 | -2.37 | 0.0004 |

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|-----------|------|--------|-----------|-------|--------|----------|-------|--------|
| PSME4 | 0.91 | 0.0003 | KPNA4 | -0.64 | 0.0053 | ZBED2 | -2.37 | 0.0005 |
| EGR1 | 0.91 | 0.0175 | USP9Y | -0.64 | 0.0016 | TPD52L1 | -2.37 | 0.0001 |
| APOL2 | 0.91 | 0.0007 | AFF4 | -0.64 | 0.0072 | FMO2 | -2.38 | 0.0000 |
| PTPRC | 0.91 | 0.0132 | KIF1B | -0.64 | 0.0012 | EHD3 | -2.39 | 0.0001 |
| DNMBP | 0.91 | 0.0001 | RAB5B | -0.64 | 0.0003 | MXD1 | -2.40 | 0.0004 |
| SLC25A36 | 0.91 | 0.0178 | BDKRB2 | -0.65 | 0.0039 | KRT24 | -2.40 | 0.0102 |
| NFIB | 0.91 | 0.0131 | DCXR | -0.65 | 0.0123 | PAX9 | -2.42 | 0.0002 |
| BIRC5 | 0.91 | 0.0035 | GID8 | -0.65 | 0.0095 | PITX1 | -2.44 | 0.0012 |
| SFXN3 | 0.90 | 0.0000 | LMO2 | -0.65 | 0.0086 | SULT2B1 | -2.46 | 0.0015 |
| NR4A1 | 0.90 | 0.0055 | GIPC1 | -0.65 | 0.0026 | EMP1 | -2.48 | 0.0003 |
| CLDN4 | 0.90 | 0.0336 | ALAD | -0.65 | 0.0019 | GNA15 | -2.49 | 0.0015 |
| HNRNPA2B1 | 0.90 | 0.0008 | SNX3 | -0.65 | 0.0077 | CRYAB | -2.53 | 0.0001 |
| VNN2 | 0.90 | 0.0043 | HIST1H2BF | -0.65 | 0.0032 | CDA | -2.54 | 0.0010 |
| ADAP2 | 0.90 | 0.0008 | TMEM80 | -0.65 | 0.0021 | HCAR3 | -2.55 | 0.0030 |
| CLMN | 0.90 | 0.0157 | CH25H | -0.65 | 0.0345 | KLK8 | -2.56 | 0.0084 |
| AP2B1 | 0.90 | 0.0006 | PLAA | -0.65 | 0.0015 | KRT4 | -2.57 | 0.0027 |
| COPB1 | 0.90 | 0.0013 | POLR2E | -0.65 | 0.0037 | GPX3 | -2.63 | 0.0000 |
| PRRC2C | 0.90 | 0.0401 | SLC7A1 | -0.65 | 0.0361 | GLTP | -2.63 | 0.0000 |
| KIAA1033 | 0.90 | 0.0062 | GALR3 | -0.65 | 0.0007 | NDUFA4L2 | -2.65 | 0.0001 |
| HAUS2 | 0.89 | 0.0009 | KCTD20 | -0.65 | 0.0000 | KRT1 | -2.66 | 0.0008 |
| KCNJ16 | 0.89 | 0.0136 | IPPK | -0.65 | 0.0084 | KLK7 | -2.66 | 0.0012 |
| CPD | 0.89 | 0.0103 | FAM108B1 | -0.65 | 0.0010 | EPHX3 | -2.67 | 0.0008 |

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|---------|------|--------|-----------|-------|--------|-----------|-------|--------|
| IFT20 | 0.89 | 0.0003 | RERE | -0.65 | 0.0014 | ADH7 | -2.70 | 0.0005 |
| UBE2J1 | 0.89 | 0.0007 | CD1A | -0.66 | 0.0011 | KLK11 | -2.71 | 0.0019 |
| TBC1D15 | 0.89 | 0.0074 | KRT10 | -0.66 | 0.0107 | ALDH3A1 | -2.74 | 0.0008 |
| MTIF2 | 0.89 | 0.0065 | PP14571 | -0.66 | 0.0009 | GPR87 | -2.74 | 0.0005 |
| CERS6 | 0.89 | 0.0219 | FBXL7 | -0.66 | 0.0395 | PKP1 | -2.75 | 0.0007 |
| SPRY4 | 0.89 | 0.0001 | PLCD1 | -0.66 | 0.0004 | HSPB8 | -2.76 | 0.0001 |
| TOP1 | 0.89 | 0.0053 | PCSK6 | -0.66 | 0.0005 | AHNAK2 | -2.78 | 0.0001 |
| SFPQ | 0.89 | 0.0007 | ARHGAP10 | -0.66 | 0.0022 | KRT16 | -2.78 | 0.0170 |
| PPAT | 0.89 | 0.0011 | MAPKBP1 | -0.66 | 0.0005 | S100A7 | -2.80 | 0.0182 |
| ABHD2 | 0.89 | 0.0127 | CAMK1D | -0.66 | 0.0000 | DSC3 | -2.86 | 0.0004 |
| TCF4 | 0.89 | 0.0140 | HIST1H2BC | -0.66 | 0.0366 | TMPRSS11D | -2.90 | 0.0004 |
| ZNF91 | 0.89 | 0.0417 | RNF10 | -0.66 | 0.0005 | TRIM29 | -2.96 | 0.0007 |
| GTF3A | 0.89 | 0.0018 | RAP1GDS1 | -0.66 | 0.0012 | AQP3 | -2.97 | 0.0010 |
| RAC2 | 0.89 | 0.0026 | IDE | -0.66 | 0.0054 | SERPINB13 | -2.97 | 0.0008 |
| FAM50A | 0.89 | 0.0003 | GAS2L1 | -0.66 | 0.0037 | ECM1 | -3.09 | 0.0003 |
| HSPA5 | 0.89 | 0.0001 | GPR161 | -0.66 | 0.0396 | SPRR2C | -3.11 | 0.0014 |
| LRP5 | 0.89 | 0.0002 | NPR3 | -0.66 | 0.0030 | S100A8 | -3.11 | 0.0017 |
| DDX18 | 0.88 | 0.0036 | GTF3C1 | -0.66 | 0.0013 | IVL | -3.11 | 0.0008 |
| CTSB | 0.88 | 0.0331 | PHLPP1 | -0.66 | 0.0022 | CRABP2 | -3.14 | 0.0005 |
| CTSL1 | 0.88 | 0.0070 | HOXA4 | -0.66 | 0.0003 | PPL | -3.15 | 0.0005 |
| ANP32E | 0.88 | 0.0095 | TSPYL4 | -0.66 | 0.0168 | ANXA1 | -3.15 | 0.0008 |
| CLIP2 | 0.88 | 0.0006 | NUDT21 | -0.66 | 0.0085 | CLCA2 | -3.16 | 0.0010 |

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|---------|------|--------|-----------|-------|--------|----------|-------|--------|
| IRF3 | 0.88 | 0.0000 | HIST1H2BE | -0.66 | 0.0015 | ZNF750 | -3.17 | 0.0002 |
| STIL | 0.88 | 0.0001 | RGS12 | -0.66 | 0.0064 | ZNF185 | -3.20 | 0.0002 |
| DCAF7 | 0.88 | 0.0013 | CYP2J2 | -0.67 | 0.0181 | DSG3 | -3.23 | 0.0007 |
| ATP2B1 | 0.88 | 0.0293 | TALDO1 | -0.67 | 0.0032 | FGFBP1 | -3.27 | 0.0004 |
| CDKN3 | 0.88 | 0.0028 | CDYL | -0.67 | 0.0001 | LYPD3 | -3.28 | 0.0007 |
| PUS7 | 0.88 | 0.0064 | NFYC | -0.67 | 0.0004 | ALOX12 | -3.28 | 0.0009 |
| PSMF1 | 0.87 | 0.0016 | RRAGA | -0.67 | 0.0011 | PPP1R3C | -3.34 | 0.0000 |
| TM9SF3 | 0.87 | 0.0122 | TEX2 | -0.67 | 0.0003 | HOPX | -3.36 | 0.0008 |
| TTC38 | 0.87 | 0.0002 | BLVRB | -0.67 | 0.0215 | KLK13 | -3.38 | 0.0004 |
| CERS2 | 0.87 | 0.0000 | WDR91 | -0.67 | 0.0010 | CYP4B1 | -3.43 | 0.0000 |
| TSNAX | 0.87 | 0.0146 | TMEM109 | -0.67 | 0.0008 | FLG | -3.48 | 0.0008 |
| AMIGO2 | 0.87 | 0.0044 | C11orf73 | -0.67 | 0.0002 | ENDOU | -3.51 | 0.0002 |
| STS | 0.87 | 0.0457 | CLIP4 | -0.67 | 0.0005 | SPINK5 | -3.52 | 0.0020 |
| SLC35D2 | 0.87 | 0.0005 | ZNF207 | -0.67 | 0.0034 | CLIC3 | -3.58 | 0.0018 |
| SP110 | 0.87 | 0.0012 | KIAA0913 | -0.67 | 0.0005 | TGM1 | -3.69 | 0.0005 |
| NPC1L1 | 0.87 | 0.0355 | DCTN4 | -0.67 | 0.0014 | KRT14 | -3.70 | 0.0064 |
| PXN | 0.87 | 0.0000 | ATP12A | -0.68 | 0.0006 | S100A9 | -3.74 | 0.0014 |
| SP100 | 0.87 | 0.0029 | HSBP1 | -0.68 | 0.0032 | KRT6B | -3.74 | 0.0035 |
| PMM2 | 0.87 | 0.0008 | C9orf9 | -0.68 | 0.0001 | S100A2 | -3.78 | 0.0021 |
| SRSF7 | 0.87 | 0.0038 | ACOX1 | -0.68 | 0.0149 | LY6D | -3.80 | 0.0016 |
| PCNA | 0.87 | 0.0008 | MTMR3 | -0.68 | 0.0002 | CSTA | -3.84 | 0.0011 |
| MCM3 | 0.87 | 0.0000 | MFSD6 | -0.68 | 0.0091 | SERPINB2 | -3.88 | 0.0007 |

| | | | | | | | | |
|-------------|------|--------|----------|-------|--------|-----------|-------|--------|
| TOR3A | 0.87 | 0.0002 | MINK1 | -0.68 | 0.0066 | SERPINB3 | -3.91 | 0.0014 |
| PBK | 0.86 | 0.0067 | ZFP36 | -0.68 | 0.0232 | SERPINB4 | -3.97 | 0.0023 |
| MYBL2 | 0.86 | 0.0013 | PRKAR1A | -0.69 | 0.0037 | CALML3 | -4.00 | 0.0002 |
| HLA-DPB1 | 0.86 | 0.0282 | GLTPD1 | -0.69 | 0.0006 | CLCA4 | -4.12 | 0.0002 |
| MCM7 | 0.86 | 0.0012 | COMT | -0.69 | 0.0042 | SCEL | -4.36 | 0.0005 |
| SLC7A7 | 0.86 | 0.0000 | PRPSAP1 | -0.69 | 0.0011 | SPRR3 | -4.37 | 0.0004 |
| SLC35D1 | 0.86 | 0.0017 | ZMIZ1 | -0.69 | 0.0054 | CRISP3 | -4.38 | 0.0011 |
| HNRNPU | 0.86 | 0.0003 | TUBB3 | -0.69 | 0.0013 | TMPRSS11E | -4.42 | 0.0004 |
| PROCR | 0.86 | 0.0003 | PDHB | -0.69 | 0.0012 | KRT5 | -4.42 | 0.0008 |
| MTERFD1 | 0.86 | 0.0015 | METAP1 | -0.69 | 0.0028 | TGM3 | -4.42 | 0.0001 |
| RAB15 | 0.86 | 0.0003 | KPNA1 | -0.69 | 0.0010 | SLURP1 | -4.43 | 0.0001 |
| ZNF611 | 0.86 | 0.0003 | CDC5L | -0.69 | 0.0000 | KRT15 | -4.44 | 0.0002 |
| DPY19L4 | 0.86 | 0.0017 | MAP2K4 | -0.69 | 0.0082 | SPRR1A | -4.54 | 0.0005 |
| SLC52A2 | 0.86 | 0.0003 | ARF1 | -0.69 | 0.0048 | KRT6A | -4.86 | 0.0005 |
| DGKZ | 0.86 | 0.0005 | ENTPD3 | -0.70 | 0.0230 | SPRR1B | -4.86 | 0.0006 |
| HLA-G | 0.86 | 0.0001 | C21orf33 | -0.70 | 0.0004 | KRT13 | -5.10 | 0.0004 |
| LY96 | 0.86 | 0.0225 | PMVK | -0.70 | 0.0005 | CRNN | -5.11 | 0.0001 |
| LEPROTL1 | 0.86 | 0.0008 | INPP1 | -0.70 | 0.0098 | MAL | -5.11 | 0.0000 |
| FAM120A | 0.85 | 0.0044 | WAC | -0.70 | 0.0189 | RHCG | -5.14 | 0.0002 |
| DKFZP586I14 | 0.85 | 0.0013 | SERPINB8 | -0.70 | 0.0136 | CRCT1 | -5.23 | 0.0001 |
| 20 | | | | | | | | |
| TRRAP | 0.85 | 0.0000 | PBX1 | -0.70 | 0.0247 | | | |

Supplementary Table 2 Differentially expressed genes in BE tissue compared with that in NE tissue in the GSE1420 dataset

| Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value |
|--------------|-------|---------|--------------|-------|---------|--------------|-------|---------|
| TSPAN8 | 5.29 | 0.0000 | KCTD14 | 1.00 | 0.0018 | GJB1 | 0.64 | 0.0097 |
| TFF1 | 5.20 | 0.0000 | RPS6KA2 | 1.00 | 0.0136 | PLEKHB2 | 0.64 | 0.0011 |
| LGALS4 | 4.99 | 0.0000 | MYO1B | 0.99 | 0.0085 | ABCG1 | 0.64 | 0.0438 |
| KRT20 | 4.43 | 0.0008 | FHL2 | 0.99 | 0.0047 | MEST | 0.64 | 0.0430 |
| AGR2 | 4.39 | 0.0000 | RPS6KA1 | 0.98 | 0.0004 | RUNX3 | 0.64 | 0.0412 |
| OLFM4 | 4.25 | 0.0010 | FAM83E | 0.98 | 0.0043 | CTSL1 | 0.64 | 0.0437 |
| SPINK1 | 3.78 | 0.0003 | RGCC | 0.97 | 0.0299 | MAPRE2 | 0.64 | 0.0389 |
| ANXA10 | 3.63 | 0.0002 | CDR2L | 0.97 | 0.0266 | BIN1 | 0.63 | 0.0160 |
| ANPEP | 3.60 | 0.0007 | TSPAN13 | 0.97 | 0.0064 | HSPA5 | 0.63 | 0.0033 |
| SERPINA1 | 3.56 | 0.0000 | PSMB10 | 0.97 | 0.0006 | DRAM1 | 0.63 | 0.0073 |
| CTSE | 3.46 | 0.0001 | TMEM97 | 0.97 | 0.0227 | GSDMD | 0.63 | 0.0044 |
| EPCAM | 3.40 | 0.0000 | SLC9A1 | 0.97 | 0.0000 | TMPRSS15 | 0.63 | 0.0370 |
| LIPF | 3.40 | 0.0151 | TNS3 | 0.97 | 0.0100 | KCNK5 | 0.63 | 0.0244 |
| FABP1 | 3.26 | 0.0038 | RSAD2 | 0.97 | 0.0272 | JOSD1 | 0.63 | 0.0020 |
| MMP1 | 3.24 | 0.0065 | APOLD1 | 0.96 | 0.0079 | XRCC4 | 0.63 | 0.0443 |
| LYZ | 3.18 | 0.0000 | EFHD2 | 0.96 | 0.0000 | FAM105A | 0.63 | 0.0090 |
| DMBT1 | 3.15 | 0.0028 | FOS | 0.96 | 0.0315 | HSPG2 | 0.63 | 0.0276 |
| ABP1 | 3.13 | 0.0002 | CDR2 | 0.96 | 0.0137 | TSTA3 | 0.63 | 0.0175 |
| TMC5 | 3.08 | 0.0002 | GRB10 | 0.96 | 0.0046 | SPRY1 | 0.63 | 0.0245 |

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|----------|------|--------|---------|------|--------|----------|------|--------|
| GOLM1 | 3.04 | 0.0001 | BAMBI | 0.96 | 0.0043 | PDE8A | 0.63 | 0.0426 |
| TFF2 | 3.00 | 0.0006 | CCDC68 | 0.96 | 0.0307 | FLVCR2 | 0.63 | 0.0017 |
| TM4SF4 | 2.96 | 0.0041 | TMEM30B | 0.96 | 0.0451 | GK | 0.63 | 0.0079 |
| HSD17B2 | 2.92 | 0.0009 | ADRA2A | 0.96 | 0.0155 | DNAJA1 | 0.62 | 0.0233 |
| CDH17 | 2.91 | 0.0007 | CTSS | 0.96 | 0.0070 | NAT2 | 0.62 | 0.0262 |
| SLC6A14 | 2.87 | 0.0001 | BFAR | 0.95 | 0.0006 | PRR11 | 0.62 | 0.0197 |
| CA2 | 2.80 | 0.0005 | AHR | 0.95 | 0.0038 | BAX | 0.62 | 0.0037 |
| TFF3 | 2.69 | 0.0040 | C3orf52 | 0.95 | 0.0135 | MGAT4B | 0.62 | 0.0187 |
| CLDN18 | 2.66 | 0.0058 | ABHD2 | 0.94 | 0.0093 | PDE4C | 0.62 | 0.0176 |
| GALNT6 | 2.65 | 0.0000 | MYO1A | 0.94 | 0.0093 | NFATC2IP | 0.62 | 0.0274 |
| SLC44A4 | 2.64 | 0.0001 | FZD5 | 0.94 | 0.0356 | HABP2 | 0.62 | 0.0094 |
| MUC5AC | 2.62 | 0.0019 | CARD10 | 0.94 | 0.0003 | SPCS3 | 0.62 | 0.0201 |
| SI | 2.56 | 0.0082 | AKR7A3 | 0.94 | 0.0123 | ARCN1 | 0.62 | 0.0101 |
| MUC13 | 2.51 | 0.0004 | GFPT1 | 0.94 | 0.0055 | WSB1 | 0.62 | 0.0406 |
| PGC | 2.51 | 0.0279 | CFTR | 0.94 | 0.0141 | HLA-G | 0.62 | 0.0026 |
| MARCKSL1 | 2.48 | 0.0000 | SEMA4G | 0.94 | 0.0005 | TRPM4 | 0.62 | 0.0009 |
| SLC39A14 | 2.47 | 0.0000 | PTP4A2 | 0.93 | 0.0107 | SPRED2 | 0.62 | 0.0487 |
| PROM1 | 2.47 | 0.0016 | LITAF | 0.93 | 0.0023 | RPN2 | 0.62 | 0.0068 |
| TSPAN1 | 2.46 | 0.0003 | ID2 | 0.93 | 0.0155 | VNN2 | 0.62 | 0.0415 |
| PIP5K1B | 2.45 | 0.0000 | CTBP2 | 0.93 | 0.0022 | ACSL4 | 0.61 | 0.0139 |
| TM4SF20 | 2.38 | 0.0046 | TIE1 | 0.93 | 0.0164 | SLC25A13 | 0.61 | 0.0129 |
| ARL14 | 2.35 | 0.0007 | SELE | 0.93 | 0.0048 | PAK2 | 0.61 | 0.0309 |

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|----------|------|--------|----------|------|--------|---------|------|--------|
| SULT1C2 | 2.34 | 0.0016 | HBEGF | 0.92 | 0.0058 | EPAS1 | 0.61 | 0.0340 |
| CALML4 | 2.32 | 0.0012 | ZFP36L2 | 0.92 | 0.0014 | ATP1A1 | 0.61 | 0.0044 |
| REG1A | 2.32 | 0.0194 | STX3 | 0.92 | 0.0007 | ZNF165 | 0.61 | 0.0182 |
| SEL1L3 | 2.31 | 0.0000 | PTHLH | 0.92 | 0.0150 | RNASET2 | 0.61 | 0.0342 |
| ALDOB | 2.29 | 0.0053 | TOR4A | 0.92 | 0.0035 | FMOD | 0.61 | 0.0192 |
| KRT8 | 2.28 | 0.0002 | FAM134B | 0.92 | 0.0129 | RAC2 | 0.61 | 0.0295 |
| MEP1A | 2.23 | 0.0062 | ROCK2 | 0.92 | 0.0208 | ACAA2 | 0.61 | 0.0458 |
| VNN1 | 2.18 | 0.0182 | SLC35D1 | 0.92 | 0.0019 | NUP50 | 0.61 | 0.0320 |
| GATA6 | 2.17 | 0.0010 | HLA-B | 0.92 | 0.0001 | E2F3 | 0.61 | 0.0175 |
| HEPH | 2.16 | 0.0057 | PXN | 0.92 | 0.0000 | RAB22A | 0.61 | 0.0156 |
| F2RL1 | 2.15 | 0.0028 | PDIA4 | 0.92 | 0.0005 | SRI | 0.61 | 0.0141 |
| GCNT3 | 2.14 | 0.0042 | HLA-F | 0.92 | 0.0004 | ADAP1 | 0.60 | 0.0357 |
| PLA2G10 | 2.11 | 0.0004 | TMEM176A | 0.91 | 0.0050 | TBX3 | 0.60 | 0.0017 |
| HSD17B11 | 2.11 | 0.0005 | SERPINE1 | 0.91 | 0.0206 | SDF4 | 0.60 | 0.0005 |
| ISG15 | 2.09 | 0.0008 | IGFBP4 | 0.91 | 0.0280 | GOSR1 | 0.60 | 0.0078 |
| SLC26A3 | 2.06 | 0.0084 | EXT1 | 0.91 | 0.0040 | PDLIM1 | 0.60 | 0.0045 |
| ODC1 | 2.06 | 0.0001 | CHST5 | 0.91 | 0.0036 | P2RX4 | 0.60 | 0.0166 |
| SLC3A1 | 2.05 | 0.0054 | CD2AP | 0.90 | 0.0404 | CMTM6 | 0.60 | 0.0061 |
| CXCL1 | 2.03 | 0.0019 | PPAP2C | 0.90 | 0.0190 | ITGA3 | 0.60 | 0.0077 |
| TMEM176B | 1.97 | 0.0001 | RHOBTB1 | 0.90 | 0.0042 | GPR137B | 0.60 | 0.0101 |
| KRT17 | 1.97 | 0.0278 | ATP8B1 | 0.90 | 0.0048 | MOCOS | 0.60 | 0.0339 |
| SPINK4 | 1.96 | 0.0151 | GCH1 | 0.90 | 0.0368 | SLC35A2 | 0.60 | 0.0333 |

| | | | | | | | | |
|--------|------|--------|----------|------|--------|-----------|-------|--------|
| KRT18 | 1.96 | 0.0001 | GUSBP11 | 0.90 | 0.0446 | GTPBP4 | 0.60 | 0.0093 |
| CCL20 | 1.95 | 0.0034 | RAB20 | 0.90 | 0.0016 | PMM2 | 0.60 | 0.0140 |
| HMGCS2 | 1.92 | 0.0128 | STK17A | 0.90 | 0.0008 | TNFRSF12A | 0.60 | 0.0008 |
| PTGER4 | 1.88 | 0.0027 | MBD4 | 0.89 | 0.0259 | ARHGAP26 | 0.60 | 0.0046 |
| IL1B | 1.87 | 0.0000 | PPP1R14D | 0.89 | 0.0131 | FTL | 0.59 | 0.0086 |
| VCAN | 1.87 | 0.0056 | MFHAS1 | 0.89 | 0.0103 | MELK | 0.59 | 0.0234 |
| C8orf4 | 1.87 | 0.0012 | PDIA5 | 0.89 | 0.0004 | FBXW12 | 0.59 | 0.0215 |
| GPRC5A | 1.84 | 0.0001 | RHOF | 0.89 | 0.0096 | ECE1 | 0.59 | 0.0027 |
| FMO5 | 1.84 | 0.0038 | SH3BP4 | 0.89 | 0.0043 | PTPRE | 0.59 | 0.0124 |
| LYN | 1.83 | 0.0000 | VCAM1 | 0.89 | 0.0292 | NR1H3 | 0.59 | 0.0270 |
| VILL | 1.81 | 0.0008 | C4orf19 | 0.88 | 0.0212 | SLC39A8 | 0.59 | 0.0296 |
| FCGBP | 1.80 | 0.0193 | BASP1 | 0.88 | 0.0234 | SOCS3 | 0.59 | 0.0137 |
| CD55 | 1.80 | 0.0018 | TGOLN2 | 0.88 | 0.0029 | MCF2L | 0.59 | 0.0036 |
| POSTN | 1.79 | 0.0190 | CDS1 | 0.88 | 0.0260 | DOK4 | 0.59 | 0.0204 |
| IL8 | 1.78 | 0.0157 | SLC22A18 | 0.88 | 0.0150 | AGFG1 | 0.59 | 0.0007 |
| VIL1 | 1.77 | 0.0022 | SLC46A3 | 0.88 | 0.0265 | POLD3 | 0.59 | 0.0048 |
| ETNK1 | 1.77 | 0.0038 | ENC1 | 0.88 | 0.0322 | ARHGAP10 | -0.59 | 0.0056 |
| F5 | 1.75 | 0.0039 | LPIN2 | 0.88 | 0.0046 | KLHDC8A | -0.59 | 0.0047 |
| MLPH | 1.75 | 0.0003 | TNFRSF21 | 0.87 | 0.0094 | CYP2J2 | -0.59 | 0.0339 |
| CFB | 1.74 | 0.0001 | CPM | 0.87 | 0.0299 | CEP76 | -0.59 | 0.0295 |
| GREM1 | 1.74 | 0.0408 | PLCXD1 | 0.87 | 0.0296 | KCTD15 | -0.59 | 0.0027 |
| PLAT | 1.73 | 0.0024 | BAK1 | 0.87 | 0.0003 | MYL6B | -0.59 | 0.0035 |

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|----------|------|--------|----------|------|--------|-----------|-------|--------|
| FAT1 | 1.73 | 0.0000 | SLC25A24 | 0.87 | 0.0263 | LIAS | -0.60 | 0.0004 |
| GRK5 | 1.73 | 0.0003 | AURKA | 0.87 | 0.0204 | NEBL | -0.60 | 0.0178 |
| AKR1C3 | 1.73 | 0.0042 | ARL6IP1 | 0.87 | 0.0153 | BCKDHA | -0.60 | 0.0043 |
| IFI27 | 1.72 | 0.0001 | FCGRT | 0.87 | 0.0036 | ZNF395 | -0.60 | 0.0011 |
| GPA33 | 1.71 | 0.0035 | GLS | 0.87 | 0.0061 | MAPK14 | -0.60 | 0.0010 |
| ARPC1B | 1.70 | 0.0000 | HPCAL1 | 0.87 | 0.0005 | CRTAC1 | -0.60 | 0.0000 |
| CXCL3 | 1.69 | 0.0049 | MYO10 | 0.87 | 0.0012 | DLG1 | -0.60 | 0.0315 |
| APOBEC3A | 1.69 | 0.0111 | ELTD1 | 0.86 | 0.0074 | IL17RC | -0.61 | 0.0046 |
| LEFTY1 | 1.68 | 0.0441 | LXN | 0.86 | 0.0219 | H2AFY | -0.61 | 0.0367 |
| RNF128 | 1.68 | 0.0106 | ITGB4 | 0.86 | 0.0007 | SEMA4A | -0.61 | 0.0237 |
| POU2AF1 | 1.67 | 0.0029 | CPD | 0.86 | 0.0106 | DKK4 | -0.61 | 0.0018 |
| FAM46A | 1.67 | 0.0001 | WARS | 0.86 | 0.0126 | LRRC20 | -0.61 | 0.0064 |
| IL36G | 1.66 | 0.0013 | SLCO2A1 | 0.86 | 0.0002 | AKTIP | -0.61 | 0.0245 |
| PLAUR | 1.66 | 0.0000 | ATP2B1 | 0.86 | 0.0154 | TAF9B | -0.61 | 0.0493 |
| CASP7 | 1.65 | 0.0002 | LASP1 | 0.86 | 0.0058 | BLVRB | -0.61 | 0.0348 |
| SLC20A1 | 1.64 | 0.0000 | MLEC | 0.85 | 0.0075 | FLII | -0.61 | 0.0106 |
| COL15A1 | 1.63 | 0.0180 | IFI30 | 0.85 | 0.0021 | OXCT1 | -0.61 | 0.0465 |
| PRSS23 | 1.62 | 0.0014 | FUCA1 | 0.85 | 0.0056 | FNDC4 | -0.61 | 0.0105 |
| CREB3L1 | 1.61 | 0.0001 | UPK1B | 0.85 | 0.0378 | C20orf111 | -0.61 | 0.0079 |
| IGF2BP2 | 1.61 | 0.0000 | MUC3B | 0.85 | 0.0108 | NRTN | -0.62 | 0.0123 |
| TIMP1 | 1.61 | 0.0013 | ELOVL6 | 0.84 | 0.0467 | AHDC1 | -0.62 | 0.0001 |
| FBP1 | 1.60 | 0.0012 | SOX4 | 0.84 | 0.0117 | EPHB6 | -0.62 | 0.0050 |

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|----------|------|--------|---------|------|--------|---------|-------|--------|
| SULT1A1 | 1.60 | 0.0002 | CD164 | 0.84 | 0.0259 | ELOVL4 | -0.62 | 0.0074 |
| EFNB2 | 1.59 | 0.0003 | MVP | 0.84 | 0.0007 | ST3GAL4 | -0.62 | 0.0056 |
| FA2H | 1.59 | 0.0015 | LPGAT1 | 0.84 | 0.0104 | SPSB3 | -0.62 | 0.0008 |
| IQGAP2 | 1.59 | 0.0027 | IFNGR1 | 0.84 | 0.0211 | SASH1 | -0.62 | 0.0302 |
| DDC | 1.58 | 0.0076 | CTSZ | 0.84 | 0.0174 | SLC48A1 | -0.62 | 0.0015 |
| FNDC3B | 1.57 | 0.0005 | TCF7L2 | 0.84 | 0.0228 | BBIP1 | -0.62 | 0.0241 |
| TOX3 | 1.56 | 0.0069 | ABCG2 | 0.84 | 0.0171 | CYP11A1 | -0.62 | 0.0013 |
| CXCL2 | 1.55 | 0.0024 | PDZK1 | 0.83 | 0.0366 | ASAP3 | -0.62 | 0.0022 |
| OASL | 1.54 | 0.0002 | TCF4 | 0.83 | 0.0292 | SLC39A2 | -0.62 | 0.0394 |
| MICAL2 | 1.53 | 0.0129 | DNMBP | 0.83 | 0.0002 | JMJD7 | -0.62 | 0.0402 |
| GALC | 1.53 | 0.0023 | GGT1 | 0.83 | 0.0059 | AMOTL2 | -0.63 | 0.0160 |
| C1orf115 | 1.53 | 0.0001 | GNA11 | 0.83 | 0.0113 | FGFR3 | -0.63 | 0.0121 |
| STC1 | 1.52 | 0.0009 | TRAM2 | 0.83 | 0.0011 | NLRX1 | -0.63 | 0.0189 |
| GDF15 | 1.52 | 0.0257 | SMURF2 | 0.83 | 0.0223 | FNTB | -0.63 | 0.0001 |
| ATP2A3 | 1.51 | 0.0000 | CCRL1 | 0.83 | 0.0022 | UBE4B | -0.63 | 0.0006 |
| PRR15L | 1.51 | 0.0035 | ELF4 | 0.83 | 0.0004 | KCNK7 | -0.63 | 0.0200 |
| CLDN3 | 1.49 | 0.0161 | SLC12A2 | 0.82 | 0.0151 | CALB2 | -0.63 | 0.0200 |
| CXCL6 | 1.49 | 0.0177 | KDEL2 | 0.81 | 0.0031 | ADK | -0.63 | 0.0373 |
| KRT7 | 1.49 | 0.0126 | KCNQ1 | 0.81 | 0.0186 | IDS | -0.64 | 0.0026 |
| ITGA6 | 1.49 | 0.0010 | SLC6A20 | 0.81 | 0.0086 | WNT5B | -0.64 | 0.0122 |
| APOBEC1 | 1.49 | 0.0072 | YWHAH | 0.81 | 0.0079 | SLC6A1 | -0.64 | 0.0025 |
| TMEM2 | 1.49 | 0.0000 | XBP1 | 0.81 | 0.0014 | RNF39 | -0.64 | 0.0077 |

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|-----------|------|--------|---------|------|--------|--------|-------|--------|
| DSG2 | 1.49 | 0.0068 | FLNB | 0.81 | 0.0005 | PAIP2B | -0.64 | 0.0001 |
| MET | 1.48 | 0.0006 | ERN2 | 0.81 | 0.0001 | DLEU1 | -0.64 | 0.0011 |
| SOX9 | 1.48 | 0.0027 | CHSY1 | 0.81 | 0.0087 | C9orf3 | -0.64 | 0.0100 |
| HYAL1 | 1.48 | 0.0008 | NFIB | 0.81 | 0.0336 | UBL3 | -0.64 | 0.0330 |
| PHLDA2 | 1.47 | 0.0065 | ATP2C2 | 0.81 | 0.0336 | TFAP2C | -0.64 | 0.0040 |
| EPB41L4B | 1.47 | 0.0013 | LAPTM4B | 0.80 | 0.0033 | EML3 | -0.64 | 0.0219 |
| TNFRSF10B | 1.46 | 0.0000 | BACE2 | 0.80 | 0.0324 | PORCN | -0.64 | 0.0345 |
| NAT1 | 1.46 | 0.0052 | OAS2 | 0.80 | 0.0110 | GPSM2 | -0.64 | 0.0157 |
| DDX60 | 1.46 | 0.0030 | BTN3A2 | 0.80 | 0.0350 | ITCH | -0.64 | 0.0395 |
| LAMA3 | 1.46 | 0.0028 | DTX4 | 0.80 | 0.0082 | THSD4 | -0.64 | 0.0158 |
| PKP2 | 1.45 | 0.0023 | PLIN2 | 0.80 | 0.0048 | KCNJ2 | -0.65 | 0.0301 |
| THBS1 | 1.45 | 0.0220 | CTSC | 0.80 | 0.0210 | SH3GL1 | -0.65 | 0.0166 |
| TRIM31 | 1.45 | 0.0120 | NADK | 0.80 | 0.0018 | KLHL21 | -0.65 | 0.0032 |
| NNMT | 1.44 | 0.0261 | HLA-C | 0.80 | 0.0001 | SKP1 | -0.65 | 0.0125 |
| AREG | 1.44 | 0.0112 | PLA2G16 | 0.80 | 0.0423 | HOXA1 | -0.65 | 0.0284 |
| IGKC | 1.43 | 0.0284 | TM9SF3 | 0.80 | 0.0208 | PHC1 | -0.65 | 0.0001 |
| PMP22 | 1.43 | 0.0191 | CKS2 | 0.80 | 0.0417 | CELSR2 | -0.65 | 0.0390 |
| PBLD | 1.42 | 0.0085 | VEGFA | 0.80 | 0.0231 | CERS4 | -0.66 | 0.0070 |
| DUSP4 | 1.42 | 0.0080 | CDC20 | 0.80 | 0.0243 | TUFT1 | -0.66 | 0.0287 |
| LIMA1 | 1.42 | 0.0000 | LGALS9 | 0.79 | 0.0012 | WNK1 | -0.66 | 0.0111 |
| FAM171A1 | 1.42 | 0.0028 | MAN1A1 | 0.79 | 0.0499 | CDC5L | -0.66 | 0.0000 |
| HGD | 1.41 | 0.0033 | C4BPB | 0.79 | 0.0258 | CHP1 | -0.66 | 0.0196 |

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|----------|------|--------|----------|------|--------|---------|-------|--------|
| CD93 | 1.41 | 0.0032 | WFDC1 | 0.79 | 0.0498 | CRIP2 | -0.67 | 0.0457 |
| DUSP6 | 1.41 | 0.0000 | FKBP1B | 0.79 | 0.0125 | NPEPPS | -0.67 | 0.0439 |
| IGHM | 1.41 | 0.0275 | FYN | 0.79 | 0.0209 | TRIP10 | -0.67 | 0.0132 |
| TRIB1 | 1.40 | 0.0000 | FARP1 | 0.79 | 0.0051 | CSDA | -0.67 | 0.0199 |
| LUM | 1.40 | 0.0201 | CLMN | 0.79 | 0.0131 | NDRG4 | -0.67 | 0.0339 |
| KDELR3 | 1.39 | 0.0023 | PIK3R3 | 0.79 | 0.0233 | PRDX6 | -0.67 | 0.0014 |
| RARRES3 | 1.39 | 0.0031 | PPFIA1 | 0.79 | 0.0173 | TMEM80 | -0.68 | 0.0013 |
| CYR61 | 1.39 | 0.0459 | ARMCX3 | 0.79 | 0.0262 | CPEB3 | -0.68 | 0.0217 |
| SLC1A1 | 1.39 | 0.0039 | RBM12 | 0.79 | 0.0025 | SF3B3 | -0.69 | 0.0101 |
| PARP12 | 1.38 | 0.0004 | PANX1 | 0.79 | 0.0001 | MAX | -0.69 | 0.0003 |
| TNFSF13 | 1.37 | 0.0018 | SPON1 | 0.78 | 0.0238 | CPA4 | -0.69 | 0.0154 |
| C19orf21 | 1.37 | 0.0006 | TM4SF1 | 0.78 | 0.0420 | CDK5R1 | -0.69 | 0.0308 |
| F3 | 1.37 | 0.0017 | EIF2AK3 | 0.78 | 0.0210 | FAM127A | -0.70 | 0.0029 |
| TFPI2 | 1.37 | 0.0298 | TTC38 | 0.78 | 0.0008 | TRIM13 | -0.70 | 0.0005 |
| SRGN | 1.37 | 0.0237 | RPS27L | 0.78 | 0.0113 | BNIP3L | -0.70 | 0.0020 |
| ATF3 | 1.36 | 0.0256 | CHKA | 0.78 | 0.0046 | SORT1 | -0.70 | 0.0197 |
| RCN1 | 1.35 | 0.0002 | CDC25B | 0.78 | 0.0129 | HOXA4 | -0.70 | 0.0002 |
| HRASLS2 | 1.35 | 0.0010 | SLC25A32 | 0.78 | 0.0148 | MOXD1 | -0.70 | 0.0061 |
| NR1I2 | 1.35 | 0.0060 | SLC52A2 | 0.78 | 0.0007 | NOL3 | -0.70 | 0.0016 |
| ADH1C | 1.35 | 0.0229 | PLCL2 | 0.78 | 0.0032 | ABLIM3 | -0.71 | 0.0191 |
| COL5A2 | 1.35 | 0.0181 | ITGB1 | 0.78 | 0.0226 | PINK1 | -0.71 | 0.0004 |
| COL4A2 | 1.35 | 0.0380 | IQCE | 0.78 | 0.0078 | CLDN10 | -0.71 | 0.0149 |

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|---------|------|--------|----------|------|--------|---------|-------|--------|
| GPX2 | 1.35 | 0.0021 | APOBEC3B | 0.77 | 0.0297 | CIDEA | -0.72 | 0.0150 |
| COL3A1 | 1.34 | 0.0352 | KPNA2 | 0.77 | 0.0013 | SLC27A6 | -0.72 | 0.0305 |
| PTPRH | 1.34 | 0.0014 | MX2 | 0.77 | 0.0392 | USP46 | -0.72 | 0.0375 |
| UCP2 | 1.34 | 0.0003 | PDGFA | 0.77 | 0.0292 | SOX2 | -0.73 | 0.0028 |
| LOXL2 | 1.34 | 0.0111 | CDH5 | 0.77 | 0.0422 | AMFR | -0.73 | 0.0018 |
| BHLHE41 | 1.33 | 0.0093 | ID3 | 0.77 | 0.0267 | WDR26 | -0.73 | 0.0223 |
| ACE2 | 1.33 | 0.0250 | STOM | 0.77 | 0.0230 | SPTLC1 | -0.73 | 0.0348 |
| EPS8 | 1.32 | 0.0195 | TAP1 | 0.77 | 0.0231 | EPHX1 | -0.73 | 0.0147 |
| PLS1 | 1.32 | 0.0231 | IVNS1ABP | 0.77 | 0.0161 | BMP7 | -0.73 | 0.0082 |
| RARRES1 | 1.32 | 0.0164 | DAP | 0.77 | 0.0036 | KRT32 | -0.73 | 0.0008 |
| KLF2 | 1.32 | 0.0009 | C12orf5 | 0.77 | 0.0082 | GNG4 | -0.73 | 0.0025 |
| TSPAN3 | 1.31 | 0.0015 | TDG | 0.77 | 0.0197 | KRT2 | -0.74 | 0.0107 |
| CDHR5 | 1.31 | 0.0027 | LAP3 | 0.76 | 0.0283 | MAPT | -0.74 | 0.0003 |
| S100P | 1.30 | 0.0343 | PRKRIR | 0.76 | 0.0109 | SH3GLB2 | -0.74 | 0.0028 |
| CD97 | 1.29 | 0.0000 | ASL | 0.76 | 0.0196 | SEMA3F | -0.74 | 0.0133 |
| GALNT7 | 1.29 | 0.0250 | MEOX1 | 0.76 | 0.0122 | ELMO2 | -0.75 | 0.0010 |
| COL6A3 | 1.28 | 0.0170 | NRIP1 | 0.76 | 0.0171 | GALNT14 | -0.75 | 0.0469 |
| SLC7A11 | 1.28 | 0.0012 | ARFGAP3 | 0.76 | 0.0246 | TFAP2B | -0.75 | 0.0002 |
| LAMB3 | 1.28 | 0.0004 | LMCD1 | 0.76 | 0.0132 | TYRO3 | -0.75 | 0.0033 |
| IFI35 | 1.28 | 0.0003 | LRRC59 | 0.75 | 0.0001 | FGFR2 | -0.75 | 0.0212 |
| NR4A2 | 1.27 | 0.0059 | RAMP3 | 0.75 | 0.0123 | CCDC6 | -0.76 | 0.0078 |
| PXDN | 1.26 | 0.0233 | NIPA2 | 0.75 | 0.0006 | ALDOC | -0.76 | 0.0274 |

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|---------|------|--------|----------|------|--------|---------|-------|--------|
| ENPP2 | 1.26 | 0.0291 | IFITM3 | 0.75 | 0.0094 | ROGDI | -0.76 | 0.0008 |
| C11orf9 | 1.26 | 0.0014 | CSF2RB | 0.75 | 0.0189 | ALDH9A1 | -0.76 | 0.0062 |
| PLVAP | 1.25 | 0.0003 | HEG1 | 0.75 | 0.0412 | BAIAP2 | -0.76 | 0.0121 |
| TFPI | 1.25 | 0.0011 | MTDH | 0.75 | 0.0331 | MXI1 | -0.77 | 0.0329 |
| NEDD9 | 1.25 | 0.0006 | ENG | 0.75 | 0.0175 | HDAC5 | -0.77 | 0.0002 |
| SLC16A1 | 1.24 | 0.0002 | CCRL2 | 0.75 | 0.0002 | ARL4C | -0.77 | 0.0275 |
| PSMB9 | 1.24 | 0.0017 | AHCYL2 | 0.74 | 0.0193 | HBP1 | -0.77 | 0.0044 |
| IL1R2 | 1.24 | 0.0304 | PDIA3 | 0.74 | 0.0003 | GAS7 | -0.77 | 0.0023 |
| PPARG | 1.24 | 0.0020 | MTMR11 | 0.74 | 0.0052 | RIT1 | -0.77 | 0.0466 |
| RCAN1 | 1.24 | 0.0094 | FOSL1 | 0.74 | 0.0205 | GPR110 | -0.77 | 0.0164 |
| CYBA | 1.23 | 0.0002 | LDB2 | 0.74 | 0.0234 | ZNF512B | -0.78 | 0.0098 |
| SPP1 | 1.23 | 0.0410 | LIPG | 0.74 | 0.0051 | ABHD5 | -0.78 | 0.0445 |
| IFI6 | 1.23 | 0.0354 | TNFRSF14 | 0.74 | 0.0019 | PARD3 | -0.78 | 0.0031 |
| A2M | 1.23 | 0.0166 | ZNF468 | 0.74 | 0.0367 | VLDLR | -0.79 | 0.0131 |
| GLRX | 1.22 | 0.0029 | LHFPL2 | 0.74 | 0.0012 | PDCD4 | -0.80 | 0.0306 |
| GALNT10 | 1.22 | 0.0010 | TYRP1 | 0.74 | 0.0495 | PHGDH | -0.80 | 0.0100 |
| CFI | 1.22 | 0.0026 | SHC1 | 0.74 | 0.0000 | ZFYVE21 | -0.80 | 0.0097 |
| PIGR | 1.22 | 0.0122 | MTHFD2 | 0.74 | 0.0120 | VAT1 | -0.81 | 0.0017 |
| COL4A1 | 1.21 | 0.0238 | SLC25A37 | 0.74 | 0.0094 | MKNK2 | -0.82 | 0.0003 |
| CYP3A5 | 1.20 | 0.0250 | ENTPD6 | 0.74 | 0.0012 | ALDH3A2 | -0.82 | 0.0225 |
| CDH11 | 1.19 | 0.0424 | DAB2 | 0.73 | 0.0251 | GSN | -0.82 | 0.0151 |
| ABCC3 | 1.19 | 0.0055 | TRANK1 | 0.73 | 0.0001 | KANK1 | -0.82 | 0.0099 |

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|---------|------|--------|----------|------|--------|----------|-------|--------|
| KYNU | 1.19 | 0.0245 | BCL10 | 0.73 | 0.0093 | MTERFD2 | -0.82 | 0.0001 |
| MECOM | 1.18 | 0.0105 | PSME2 | 0.73 | 0.0029 | TP53AIP1 | -0.83 | 0.0014 |
| HOXB7 | 1.18 | 0.0003 | FAR2 | 0.73 | 0.0292 | CD1A | -0.83 | 0.0001 |
| PECAM1 | 1.17 | 0.0106 | SEC24D | 0.73 | 0.0127 | SLC16A6 | -0.83 | 0.0202 |
| FKBP11 | 1.17 | 0.0017 | SELP | 0.73 | 0.0444 | SHMT1 | -0.84 | 0.0306 |
| IL32 | 1.17 | 0.0015 | UGT8 | 0.73 | 0.0002 | ALDH4A1 | -0.84 | 0.0023 |
| BTNL8 | 1.17 | 0.0027 | IFITM2 | 0.73 | 0.0300 | C18orf25 | -0.84 | 0.0200 |
| PTPRK | 1.17 | 0.0018 | CBX3 | 0.73 | 0.0335 | RNF141 | -0.84 | 0.0401 |
| DPYSL2 | 1.17 | 0.0412 | UBE2J1 | 0.73 | 0.0042 | UBE2G1 | -0.85 | 0.0043 |
| IGFBP3 | 1.17 | 0.0019 | CALU | 0.73 | 0.0203 | NEFM | -0.85 | 0.0262 |
| MUC6 | 1.16 | 0.0029 | TNFRSF1B | 0.73 | 0.0172 | IL13RA1 | -0.85 | 0.0155 |
| ISG20 | 1.16 | 0.0006 | ID1 | 0.72 | 0.0074 | CXCR2 | -0.86 | 0.0482 |
| TMPRSS3 | 1.16 | 0.0228 | HLA-A | 0.72 | 0.0005 | KRT31 | -0.86 | 0.0082 |
| HLA-DMA | 1.16 | 0.0069 | AVL9 | 0.72 | 0.0222 | TM7SF2 | -0.87 | 0.0112 |
| ANXA4 | 1.16 | 0.0225 | SLC37A1 | 0.72 | 0.0340 | VAV3 | -0.87 | 0.0394 |
| KIF3B | 1.16 | 0.0001 | CES3 | 0.72 | 0.0044 | RYR1 | -0.87 | 0.0090 |
| BST2 | 1.16 | 0.0205 | GNS | 0.72 | 0.0290 | RMND5B | -0.87 | 0.0011 |
| SULT1A2 | 1.15 | 0.0010 | ZC3H12A | 0.72 | 0.0130 | EYA2 | -0.87 | 0.0165 |
| HSP90B1 | 1.15 | 0.0008 | PON2 | 0.72 | 0.0187 | LPIN1 | -0.88 | 0.0045 |
| CHN2 | 1.15 | 0.0064 | PSMB8 | 0.72 | 0.0052 | KAT2B | -0.88 | 0.0453 |
| ACSL5 | 1.14 | 0.0131 | SCCPDH | 0.72 | 0.0165 | TMEM159 | -0.88 | 0.0006 |
| CDHR2 | 1.14 | 0.0019 | PDE4B | 0.71 | 0.0482 | OBFC1 | -0.89 | 0.0065 |

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|---------|------|--------|---------|------|--------|---------|-------|--------|
| ELF3 | 1.14 | 0.0040 | CASK | 0.71 | 0.0283 | GCHFR | -0.89 | 0.0257 |
| PAPSS2 | 1.14 | 0.0130 | IL2RG | 0.71 | 0.0155 | SH3GL3 | -0.89 | 0.0002 |
| IGLL3P | 1.13 | 0.0245 | EPHB2 | 0.71 | 0.0053 | GM2A | -0.90 | 0.0193 |
| USH1C | 1.13 | 0.0071 | AADAC | 0.71 | 0.0067 | ALOX15B | -0.90 | 0.0333 |
| VOPP1 | 1.12 | 0.0061 | MGAT2 | 0.71 | 0.0317 | MAF | -0.91 | 0.0161 |
| TM4SF5 | 1.12 | 0.0134 | ENTPD7 | 0.71 | 0.0017 | HRASLS | -0.92 | 0.0002 |
| RGS5 | 1.12 | 0.0297 | CDC14B | 0.71 | 0.0250 | ARHGEF4 | -0.92 | 0.0146 |
| ETS2 | 1.12 | 0.0005 | PAPOLA | 0.71 | 0.0260 | RANBP9 | -0.92 | 0.0391 |
| UGT2B15 | 1.12 | 0.0009 | MINPP1 | 0.71 | 0.0018 | MYCL1 | -0.92 | 0.0190 |
| GBP1 | 1.11 | 0.0206 | ENTPD4 | 0.71 | 0.0137 | BLVRA | -0.93 | 0.0021 |
| RNASE1 | 1.11 | 0.0316 | DENND1A | 0.71 | 0.0054 | NAGK | -0.93 | 0.0131 |
| TNPO1 | 1.11 | 0.0029 | MICALL2 | 0.71 | 0.0038 | SLC24A3 | -0.94 | 0.0163 |
| SLC4A4 | 1.11 | 0.0120 | FOXA2 | 0.71 | 0.0063 | BCL11A | -0.94 | 0.0022 |
| PLOD3 | 1.10 | 0.0004 | TAPBP | 0.71 | 0.0006 | SUSD4 | -0.94 | 0.0097 |
| TGFBI | 1.10 | 0.0069 | SDCBP | 0.70 | 0.0441 | DOCK9 | -0.94 | 0.0110 |
| TNFAIP3 | 1.10 | 0.0285 | SEC24A | 0.70 | 0.0145 | TTC22 | -0.95 | 0.0101 |
| CBLB | 1.10 | 0.0028 | NCLN | 0.70 | 0.0009 | KRT33A | -0.95 | 0.0003 |
| LY75 | 1.10 | 0.0274 | APLNR | 0.70 | 0.0253 | EFS | -0.95 | 0.0216 |
| SPTBN1 | 1.10 | 0.0043 | TANK | 0.70 | 0.0319 | GYS2 | -0.96 | 0.0394 |
| EPS8L3 | 1.10 | 0.0061 | LDLR | 0.70 | 0.0409 | SYNGR1 | -0.99 | 0.0022 |
| SSFA2 | 1.10 | 0.0013 | VASP | 0.70 | 0.0002 | NEFL | -1.00 | 0.0197 |
| KCNK1 | 1.10 | 0.0097 | PTK2 | 0.69 | 0.0251 | NDRG2 | -1.00 | 0.0055 |

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|---------|------|--------|----------|------|--------|---------|-------|--------|
| TXNRD1 | 1.10 | 0.0034 | SP110 | 0.69 | 0.0011 | VSNL1 | -1.01 | 0.0495 |
| GPR35 | 1.08 | 0.0002 | SLC35E1 | 0.69 | 0.0092 | LDOC1 | -1.01 | 0.0001 |
| DAPK1 | 1.08 | 0.0139 | PRR13 | 0.69 | 0.0037 | C3orf14 | -1.01 | 0.0128 |
| CPS1 | 1.08 | 0.0272 | CERS2 | 0.69 | 0.0005 | AGFG2 | -1.02 | 0.0011 |
| LAMC2 | 1.08 | 0.0004 | LGALS3BP | 0.69 | 0.0030 | CALML5 | -1.04 | 0.0046 |
| ADAMTS1 | 1.08 | 0.0366 | FAM120A | 0.69 | 0.0177 | IMPA2 | -1.06 | 0.0147 |
| FUT8 | 1.08 | 0.0009 | CEP55 | 0.69 | 0.0188 | WNT4 | -1.06 | 0.0072 |
| INSR | 1.08 | 0.0026 | RGS3 | 0.69 | 0.0283 | ECHDC3 | -1.07 | 0.0111 |
| MST1R | 1.08 | 0.0005 | TMEM184B | 0.69 | 0.0009 | EHD3 | -1.07 | 0.0412 |
| MDK | 1.07 | 0.0027 | MAP2K3 | 0.69 | 0.0153 | RORA | -1.07 | 0.0086 |
| ASS1 | 1.07 | 0.0105 | SLC35D2 | 0.69 | 0.0025 | ZFAND5 | -1.07 | 0.0028 |
| ATP7B | 1.07 | 0.0015 | F2R | 0.68 | 0.0279 | C2orf54 | -1.09 | 0.0131 |
| FUT4 | 1.07 | 0.0187 | SLC16A3 | 0.68 | 0.0495 | ESPL1 | -1.09 | 0.0190 |
| ASAP2 | 1.06 | 0.0023 | TRIM15 | 0.68 | 0.0240 | IL36A | -1.09 | 0.0178 |
| APOL1 | 1.06 | 0.0110 | S100A6 | 0.68 | 0.0000 | EPB41L3 | -1.10 | 0.0365 |
| NQO1 | 1.06 | 0.0185 | RNF114 | 0.68 | 0.0154 | PDLIM2 | -1.10 | 0.0059 |
| ITPR3 | 1.06 | 0.0005 | CDX1 | 0.68 | 0.0126 | FMO2 | -1.11 | 0.0276 |
| STEAP1 | 1.06 | 0.0112 | CTSH | 0.68 | 0.0287 | BBOX1 | -1.11 | 0.0216 |
| GSDMB | 1.06 | 0.0228 | TNIK | 0.68 | 0.0432 | ALDH3B2 | -1.12 | 0.0061 |
| FOSB | 1.06 | 0.0221 | TRAF4 | 0.68 | 0.0128 | PDZD2 | -1.14 | 0.0022 |
| ANO1 | 1.06 | 0.0106 | CERS6 | 0.67 | 0.0350 | CBR3 | -1.15 | 0.0109 |
| FERMT1 | 1.06 | 0.0014 | GCNT1 | 0.67 | 0.0346 | PAX9 | -1.16 | 0.0455 |

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|----------|------|--------|----------|------|--------|----------|-------|--------|
| NT5E | 1.05 | 0.0044 | PTPRG | 0.67 | 0.0075 | CRYAB | -1.17 | 0.0326 |
| C11orf24 | 1.05 | 0.0000 | EDEM3 | 0.67 | 0.0340 | PIR | -1.17 | 0.0003 |
| RRBP1 | 1.05 | 0.0000 | CNDP2 | 0.67 | 0.0111 | TTC9 | -1.18 | 0.0221 |
| TESC | 1.05 | 0.0111 | SEPHS2 | 0.67 | 0.0364 | BNIP3 | -1.19 | 0.0147 |
| STAT1 | 1.04 | 0.0396 | CIDEC | 0.67 | 0.0068 | PMM1 | -1.26 | 0.0003 |
| TGFBR2 | 1.04 | 0.0449 | TPK1 | 0.67 | 0.0467 | HLA-DQB2 | -1.28 | 0.0004 |
| PLEK2 | 1.04 | 0.0001 | DACH1 | 0.66 | 0.0129 | NT5DC2 | -1.30 | 0.0004 |
| TRPA1 | 1.04 | 0.0026 | TCF7 | 0.66 | 0.0041 | HSPA2 | -1.31 | 0.0170 |
| TCIRG1 | 1.04 | 0.0002 | MYO15B | 0.66 | 0.0096 | HLF | -1.33 | 0.0096 |
| PODXL | 1.03 | 0.0005 | LRRFIP1 | 0.66 | 0.0183 | PTN | -1.35 | 0.0028 |
| HEXB | 1.03 | 0.0036 | IL6R | 0.66 | 0.0317 | ANXA9 | -1.36 | 0.0061 |
| CRIP1 | 1.03 | 0.0284 | KIF13B | 0.66 | 0.0016 | NDUFA4L2 | -1.38 | 0.0185 |
| RAI14 | 1.02 | 0.0220 | SPRY4 | 0.66 | 0.0018 | CES1 | -1.38 | 0.0220 |
| APP | 1.02 | 0.0041 | SFXN3 | 0.66 | 0.0008 | ADH7 | -1.44 | 0.0430 |
| LPCAT1 | 1.02 | 0.0009 | ADH6 | 0.66 | 0.0119 | CITED2 | -1.45 | 0.0143 |
| HK2 | 1.02 | 0.0188 | PSME4 | 0.66 | 0.0054 | RRAGD | -1.46 | 0.0008 |
| TRIB2 | 1.01 | 0.0027 | KIAA1324 | 0.65 | 0.0159 | BEX4 | -1.51 | 0.0026 |
| BMP2 | 1.01 | 0.0035 | AKAP13 | 0.65 | 0.0173 | CD207 | -1.51 | 0.0000 |
| IRF8 | 1.01 | 0.0095 | ERAP1 | 0.65 | 0.0013 | AHNAK | -1.53 | 0.0008 |
| NR0B2 | 1.01 | 0.0008 | PIGG | 0.65 | 0.0019 | ZBED2 | -1.55 | 0.0151 |
| LSR | 1.01 | 0.0197 | XPNPEP1 | 0.65 | 0.0048 | LY6G6C | -1.61 | 0.0097 |
| GPR126 | 1.01 | 0.0385 | ZNF721 | 0.65 | 0.0199 | CYP4B1 | -1.62 | 0.0084 |

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|--------|------|--------|----------|------|--------|--------|-------|--------|
| RRM2 | 1.00 | 0.0221 | MAP3K5 | 0.65 | 0.0100 | UPK3B | -1.66 | 0.0061 |
| VPS13C | 1.00 | 0.0310 | C19orf10 | 0.64 | 0.0003 | FCER1A | -1.66 | 0.0001 |
| DPP4 | 1.00 | 0.0076 | LRRC31 | 0.64 | 0.0017 | KRT1 | -1.83 | 0.0139 |

Supplementary Table 3 Differentially expressed genes in EAC tissue compared with that in BE tissue in the GSE1420 dataset

| Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value | Gene Symbols | LogFC | P-value |
|--------------|-------|---------|--------------|-------|---------|--------------|-------|---------|
| SERPINA3 | 1.66 | 0.0075 | DBF4 | 0.62 | 0.0124 | ETS2 | -0.88 | 0.0033 |
| C3 | 1.65 | 0.0183 | DCLRE1C | 0.61 | 0.0089 | TJP1 | -0.88 | 0.0045 |
| COL11A1 | 1.62 | 0.0080 | PTPN6 | 0.61 | 0.0052 | CDH1 | -0.89 | 0.0322 |
| CST1 | 1.56 | 0.0013 | HELLS | 0.61 | 0.0093 | CAMSAP1 | -0.89 | 0.0006 |
| C1QB | 1.53 | 0.0013 | BTN3A2 | 0.61 | 0.0109 | PLCXD1 | -0.90 | 0.0258 |
| TMPRSS3 | 1.52 | 0.0041 | RAB17 | 0.61 | 0.0178 | VAMP3 | -0.90 | 0.0042 |
| IGF2BP3 | 1.34 | 0.0067 | CLIP2 | 0.61 | 0.0111 | SYPL1 | -0.90 | 0.0100 |
| PNMA2 | 1.30 | 0.0443 | TMEM176A | 0.61 | 0.0479 | SOX15 | -0.90 | 0.0088 |
| APOE | 1.28 | 0.0145 | SFPQ | 0.61 | 0.0134 | NDRG2 | -0.90 | 0.0106 |
| PLEKHB1 | 1.27 | 0.0144 | FKBP9 | 0.61 | 0.0005 | PER2 | -0.90 | 0.0088 |
| SEZ6L2 | 1.26 | 0.0007 | MTHFD2 | 0.61 | 0.0335 | PNP | -0.90 | 0.0498 |
| MXRA5 | 1.25 | 0.0024 | CENPF | 0.61 | 0.0060 | ABLIM1 | -0.91 | 0.0145 |
| SFRP4 | 1.25 | 0.0255 | OLFML2B | 0.61 | 0.0484 | MYOF | -0.91 | 0.0077 |
| MSLN | 1.25 | 0.0268 | SSB | 0.61 | 0.0370 | SLC38A2 | -0.92 | 0.0258 |
| DTL | 1.22 | 0.0011 | LEPROTL1 | 0.61 | 0.0338 | ZG16 | -0.92 | 0.0369 |
| HLA-DQA1 | 1.21 | 0.0416 | CEP170 | 0.61 | 0.0172 | ADORA2B | -0.93 | 0.0198 |
| SPP1 | 1.21 | 0.0452 | NCAPG | 0.61 | 0.0065 | RNF141 | -0.93 | 0.0247 |
| SULF1 | 1.19 | 0.0172 | APMAP | 0.61 | 0.0027 | SGK1 | -0.93 | 0.0320 |
| CCL5 | 1.18 | 0.0197 | PBK | 0.61 | 0.0478 | C1orf116 | -0.94 | 0.0389 |

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|---------|------|--------|----------|------|--------|----------|-------|--------|
| TMEM97 | 1.16 | 0.0063 | PKN1 | 0.61 | 0.0139 | OSTF1 | -0.94 | 0.0032 |
| MEST | 1.15 | 0.0008 | FAM50A | 0.60 | 0.0073 | DNAJB1 | -0.95 | 0.0304 |
| ECT2 | 1.12 | 0.0042 | NSUN5 | 0.60 | 0.0034 | CAV1 | -0.95 | 0.0455 |
| HOXA10 | 1.07 | 0.0086 | CLCN4 | 0.60 | 0.0089 | MBD2 | -0.95 | 0.0058 |
| APOC1 | 1.05 | 0.0030 | FGFR4 | 0.60 | 0.0339 | HRASLS2 | -0.95 | 0.0145 |
| C1QA | 1.03 | 0.0038 | FBXW12 | 0.60 | 0.0196 | SERPINB8 | -0.96 | 0.0013 |
| TTK | 1.03 | 0.0033 | SELPLG | 0.60 | 0.0394 | PPIF | -0.96 | 0.0177 |
| TOX3 | 1.02 | 0.0288 | NSL1 | 0.60 | 0.0436 | PPP1R13L | -0.96 | 0.0241 |
| HLA-DMA | 1.01 | 0.0161 | GGA2 | 0.60 | 0.0002 | KAZN | -0.96 | 0.0305 |
| IDO1 | 1.00 | 0.0105 | SOCS1 | 0.60 | 0.0187 | GJB3 | -0.97 | 0.0078 |
| BIRC3 | 1.00 | 0.0146 | ZC3H7B | 0.60 | 0.0203 | PTGS1 | -0.97 | 0.0097 |
| BGN | 0.98 | 0.0070 | HLA-DRB6 | 0.60 | 0.0250 | SLC1A1 | -0.98 | 0.0333 |
| TOP2A | 0.98 | 0.0119 | FOXA2 | 0.60 | 0.0177 | HMGCR | -0.98 | 0.0351 |
| CXCL9 | 0.98 | 0.0018 | MYBL2 | 0.60 | 0.0190 | P2RY2 | -0.99 | 0.0102 |
| VOPP1 | 0.97 | 0.0158 | STAG3L1 | 0.60 | 0.0101 | PRKCH | -0.99 | 0.0108 |
| COL10A1 | 0.95 | 0.0054 | AP5Z1 | 0.59 | 0.0111 | MT1X | -0.99 | 0.0133 |
| NEK2 | 0.95 | 0.0024 | XPO1 | 0.59 | 0.0432 | NSG1 | -0.99 | 0.0105 |
| NPIPL3 | 0.94 | 0.0025 | RPS21 | 0.59 | 0.0463 | UPK1B | -0.99 | 0.0185 |
| SEC62 | 0.94 | 0.0427 | TGIF2 | 0.59 | 0.0160 | PTHLH | -1.00 | 0.0084 |
| CBX3 | 0.93 | 0.0046 | BZW2 | 0.59 | 0.0052 | SLC9A3R1 | -1.00 | 0.0357 |
| CD74 | 0.92 | 0.0080 | BORA | 0.59 | 0.0014 | WDR1 | -1.00 | 0.0016 |
| NDC80 | 0.91 | 0.0030 | HDAC9 | 0.59 | 0.0249 | YWHAZ | -1.00 | 0.0070 |

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|----------|------|--------|----------|-------|--------|---------|-------|--------|
| CNOT2 | 0.91 | 0.0093 | TFAM | 0.59 | 0.0253 | HSPA4L | -1.01 | 0.0126 |
| MICB | 0.91 | 0.0003 | E2F3 | 0.59 | 0.0208 | MUC6 | -1.01 | 0.0083 |
| ASNS | 0.91 | 0.0044 | HERC5 | 0.59 | 0.0313 | EZR | -1.01 | 0.0012 |
| CTSS | 0.90 | 0.0037 | SPR | 0.59 | 0.0019 | PYGL | -1.01 | 0.0237 |
| PSMB9 | 0.90 | 0.0168 | TMEM5 | 0.59 | 0.0019 | BBOX1 | -1.02 | 0.0338 |
| HLA-DPA1 | 0.90 | 0.0179 | BIRC5 | 0.59 | 0.0465 | RHOD | -1.02 | 0.0246 |
| MMP11 | 0.90 | 0.0023 | AIF1 | 0.59 | 0.0026 | FUT6 | -1.03 | 0.0254 |
| PTPRR | 0.90 | 0.0050 | HSP90AA1 | 0.59 | 0.0227 | BNIP3 | -1.04 | 0.0308 |
| RFC4 | 0.90 | 0.0003 | HSPD1 | 0.59 | 0.0331 | WNT5A | -1.04 | 0.0312 |
| RAMP1 | 0.89 | 0.0345 | PNISR | 0.58 | 0.0254 | AHNAK | -1.04 | 0.0013 |
| IFRD1 | 0.89 | 0.0265 | SIAH2 | -0.59 | 0.0088 | EVPL | -1.04 | 0.0421 |
| HLA-DPB1 | 0.89 | 0.0244 | C1orf56 | -0.59 | 0.0078 | RANBP9 | -1.05 | 0.0231 |
| LAPTM5 | 0.89 | 0.0322 | SLC12A6 | -0.60 | 0.0125 | THBD | -1.05 | 0.0017 |
| TESC | 0.88 | 0.0295 | MEOX1 | -0.60 | 0.0432 | EMP2 | -1.06 | 0.0071 |
| AURKA | 0.88 | 0.0340 | MAPK1 | -0.60 | 0.0139 | ARHGEF4 | -1.06 | 0.0056 |
| HMMR | 0.87 | 0.0025 | GAS2L1 | -0.60 | 0.0121 | HPGD | -1.07 | 0.0272 |
| HLA-DQB1 | 0.87 | 0.0107 | PDLIM5 | -0.60 | 0.0466 | CSRP2 | -1.08 | 0.0069 |
| NUP107 | 0.87 | 0.0155 | LTB4R | -0.60 | 0.0433 | GLUL | -1.08 | 0.0070 |
| IGFBP3 | 0.86 | 0.0417 | TAX1BP3 | -0.60 | 0.0354 | CEACAM1 | -1.08 | 0.0214 |
| RCN1 | 0.86 | 0.0090 | ARF4 | -0.60 | 0.0050 | TMEM45A | -1.09 | 0.0239 |
| KCNJ16 | 0.86 | 0.0168 | IGSF3 | -0.60 | 0.0065 | ENO1 | -1.10 | 0.0052 |
| N4BP2L2 | 0.86 | 0.0101 | RER1 | -0.61 | 0.0231 | AREG | -1.11 | 0.0446 |

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|----------|------|--------|---------|-------|--------|----------|-------|--------|
| NFE2L3 | 0.85 | 0.0025 | DNAJA2 | -0.61 | 0.0049 | RAPGEFL1 | -1.11 | 0.0130 |
| MCM3 | 0.85 | 0.0000 | IRX4 | -0.61 | 0.0423 | PLAT | -1.11 | 0.0393 |
| IL32 | 0.85 | 0.0158 | BDKRB2 | -0.61 | 0.0059 | CYP2C18 | -1.12 | 0.0200 |
| DDIT3 | 0.84 | 0.0417 | GDI2 | -0.61 | 0.0330 | GDPD3 | -1.12 | 0.0235 |
| SORD | 0.84 | 0.0321 | CLDN1 | -0.61 | 0.0498 | PDLIM2 | -1.12 | 0.0051 |
| ABHD11 | 0.84 | 0.0363 | OTUB2 | -0.61 | 0.0137 | RASAL1 | -1.13 | 0.0033 |
| LAPTM4B | 0.83 | 0.0036 | BMP7 | -0.61 | 0.0340 | DARC | -1.13 | 0.0455 |
| SLAMF8 | 0.83 | 0.0125 | LMO2 | -0.61 | 0.0119 | TFAP2C | -1.16 | 0.0337 |
| TRAF5 | 0.83 | 0.0079 | ATP2A3 | -0.62 | 0.0309 | VSNL1 | -1.16 | 0.0255 |
| SDC4 | 0.83 | 0.0133 | HEXIM1 | -0.62 | 0.0103 | KANK1 | -1.16 | 0.0006 |
| CACYBP | 0.83 | 0.0031 | BNC1 | -0.62 | 0.0177 | TTC9 | -1.17 | 0.0233 |
| GIN51 | 0.82 | 0.0229 | TUBB3 | -0.62 | 0.0032 | CNN3 | -1.19 | 0.0049 |
| GTF3A | 0.82 | 0.0035 | MAP3K6 | -0.62 | 0.0139 | ARG2 | -1.19 | 0.0312 |
| TBC1D15 | 0.82 | 0.0130 | N4BP1 | -0.62 | 0.0236 | RBP1 | -1.19 | 0.0089 |
| IRF1 | 0.81 | 0.0128 | SHROOM2 | -0.63 | 0.0311 | DKK1 | -1.20 | 0.0429 |
| HLTF | 0.81 | 0.0262 | MAP7D1 | -0.63 | 0.0179 | F3 | -1.21 | 0.0048 |
| PTP4A2 | 0.81 | 0.0402 | CTNND1 | -0.63 | 0.0472 | PHLDA1 | -1.23 | 0.0161 |
| C20orf20 | 0.81 | 0.0067 | NLRX1 | -0.63 | 0.0188 | RCOR1 | -1.23 | 0.0017 |
| DNAJC2 | 0.81 | 0.0165 | C14orf1 | -0.63 | 0.0291 | IGFBP6 | -1.24 | 0.0352 |
| POMZP3 | 0.80 | 0.0076 | RARG | -0.63 | 0.0330 | SLC24A3 | -1.24 | 0.0013 |
| HS2ST1 | 0.80 | 0.0035 | PSMD6 | -0.63 | 0.0024 | PTPRZ1 | -1.25 | 0.0082 |
| TBC1D30 | 0.80 | 0.0217 | CBR1 | -0.63 | 0.0076 | SERPINB1 | -1.25 | 0.0303 |

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|----------|------|--------|----------|-------|--------|----------|-------|--------|
| CST4 | 0.80 | 0.0000 | RRAS2 | -0.64 | 0.0204 | KLF4 | -1.25 | 0.0040 |
| RFC3 | 0.80 | 0.0015 | FOXE1 | -0.64 | 0.0215 | SCGB1A1 | -1.25 | 0.0113 |
| HMGB2 | 0.79 | 0.0489 | ALDH7A1 | -0.64 | 0.0140 | PAX9 | -1.26 | 0.0316 |
| SAC3D1 | 0.79 | 0.0060 | ATP7B | -0.64 | 0.0398 | SCNN1B | -1.26 | 0.0171 |
| ZNF292 | 0.79 | 0.0382 | AACS | -0.65 | 0.0463 | FMO2 | -1.27 | 0.0133 |
| TYROBP | 0.79 | 0.0459 | ARL4D | -0.65 | 0.0078 | NDUFA4L2 | -1.27 | 0.0290 |
| NFKBIE | 0.79 | 0.0015 | GFOD1 | -0.65 | 0.0023 | TRIM16 | -1.27 | 0.0057 |
| MCM7 | 0.79 | 0.0011 | LRP10 | -0.65 | 0.0043 | IL18 | -1.27 | 0.0412 |
| ATP8B1 | 0.78 | 0.0128 | NDEL1 | -0.65 | 0.0058 | FZD10 | -1.28 | 0.0146 |
| SMS | 0.78 | 0.0238 | MAP2K1 | -0.65 | 0.0136 | MREG | -1.28 | 0.0281 |
| LY6E | 0.78 | 0.0350 | FST | -0.65 | 0.0161 | PDCD4 | -1.29 | 0.0365 |
| HOXB7 | 0.78 | 0.0077 | VDAC2 | -0.65 | 0.0002 | PALMD | -1.29 | 0.0008 |
| UCP2 | 0.78 | 0.0204 | GNAI3 | -0.65 | 0.0477 | CD9 | -1.30 | 0.0020 |
| HLA-DMB | 0.78 | 0.0030 | CDK5R1 | -0.65 | 0.0404 | AKR1C1 | -1.31 | 0.0011 |
| ETV1 | 0.78 | 0.0360 | IPPK | -0.65 | 0.0085 | BICD2 | -1.32 | 0.0009 |
| CSE1L | 0.78 | 0.0133 | TOLLIP | -0.66 | 0.0445 | EHD3 | -1.32 | 0.0136 |
| MET | 0.77 | 0.0496 | NDST1 | -0.66 | 0.0019 | DGKA | -1.32 | 0.0046 |
| ATP6V0E2 | 0.76 | 0.0157 | WASF2 | -0.66 | 0.0029 | CA12 | -1.33 | 0.0159 |
| PHIP | 0.76 | 0.0050 | PPARD | -0.66 | 0.0056 | FAT2 | -1.33 | 0.0063 |
| CDK1 | 0.76 | 0.0164 | ATP6V1D | -0.66 | 0.0055 | HSPB1 | -1.35 | 0.0038 |
| PRPS2 | 0.76 | 0.0022 | TMPRSS15 | -0.66 | 0.0291 | DHRS9 | -1.36 | 0.0057 |
| CKLF | 0.76 | 0.0011 | RAB11A | -0.66 | 0.0295 | CRYAB | -1.36 | 0.0147 |

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|----------|------|--------|---------|-------|--------|-----------|-------|--------|
| ELF3 | 0.76 | 0.0446 | KRT10 | -0.66 | 0.0100 | C10orf116 | -1.36 | 0.0126 |
| EIF2AK1 | 0.75 | 0.0025 | WSB2 | -0.66 | 0.0051 | GJB5 | -1.36 | 0.0091 |
| HNMT | 0.75 | 0.0092 | NDRG4 | -0.67 | 0.0343 | AKR1C2 | -1.38 | 0.0014 |
| GMNN | 0.75 | 0.0202 | PLXNA2 | -0.67 | 0.0028 | CCNG2 | -1.38 | 0.0119 |
| GTSE1 | 0.75 | 0.0047 | CSDA | -0.67 | 0.0194 | MTSS1 | -1.39 | 0.0003 |
| C5orf15 | 0.75 | 0.0120 | ATP5A1 | -0.68 | 0.0020 | CWH43 | -1.40 | 0.0204 |
| CXCL11 | 0.75 | 0.0262 | DR1 | -0.68 | 0.0070 | IL1R2 | -1.40 | 0.0131 |
| TSNAX | 0.74 | 0.0343 | CAPN1 | -0.68 | 0.0412 | GJA1 | -1.41 | 0.0088 |
| TIA1 | 0.74 | 0.0282 | HIGD1A | -0.68 | 0.0089 | PERP | -1.43 | 0.0023 |
| PLXNC1 | 0.74 | 0.0279 | RGS20 | -0.68 | 0.0133 | IL1B | -1.46 | 0.0002 |
| NEU1 | 0.74 | 0.0079 | BZW1 | -0.68 | 0.0124 | EFS | -1.47 | 0.0009 |
| APOBEC3B | 0.74 | 0.0367 | MFN2 | -0.68 | 0.0040 | RRAD | -1.48 | 0.0018 |
| SOX4 | 0.74 | 0.0037 | NRG1 | -0.68 | 0.0001 | AIM1L | -1.49 | 0.0134 |
| ITGB3BP | 0.74 | 0.0123 | NPEPPS | -0.69 | 0.0177 | SLC26A3 | -1.53 | 0.0436 |
| EFNA1 | 0.74 | 0.0022 | ALDH1A3 | -0.69 | 0.0497 | IL36G | -1.54 | 0.0024 |
| SKAP2 | 0.74 | 0.0328 | ISG20 | -0.69 | 0.0345 | MXD1 | -1.54 | 0.0140 |
| TERF1 | 0.73 | 0.0196 | LPHN2 | -0.69 | 0.0407 | MPZL2 | -1.55 | 0.0071 |
| INSR | 0.73 | 0.0324 | GLUD1 | -0.69 | 0.0055 | KLK5 | -1.57 | 0.0239 |
| SEPHS2 | 0.73 | 0.0240 | UBE2H | -0.69 | 0.0140 | TPD52L1 | -1.58 | 0.0063 |
| PION | 0.72 | 0.0132 | ENSA | -0.69 | 0.0028 | TUBB6 | -1.59 | 0.0008 |
| ITGB2 | 0.72 | 0.0240 | MAOA | -0.69 | 0.0237 | TCN1 | -1.59 | 0.0079 |
| GATAD1 | 0.72 | 0.0335 | CSNK1A1 | -0.69 | 0.0367 | PGD | -1.60 | 0.0175 |

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|----------|------|--------|---------|-------|--------|---------|-------|--------|
| NUP43 | 0.72 | 0.0166 | HEBP2 | -0.70 | 0.0035 | S100A14 | -1.61 | 0.0213 |
| ANKMY2 | 0.72 | 0.0326 | MT1P2 | -0.70 | 0.0139 | EREG | -1.62 | 0.0164 |
| FNBP1L | 0.72 | 0.0192 | SLCO2A1 | -0.70 | 0.0016 | DUSP7 | -1.64 | 0.0007 |
| LMNB1 | 0.71 | 0.0210 | CELSR2 | -0.70 | 0.0202 | DSC2 | -1.68 | 0.0190 |
| MDM1 | 0.71 | 0.0432 | MICALL1 | -0.71 | 0.0189 | ALDH3A1 | -1.68 | 0.0267 |
| PRR11 | 0.71 | 0.0088 | ERLIN1 | -0.71 | 0.0108 | HSPB8 | -1.69 | 0.0060 |
| MAD2L1 | 0.71 | 0.0066 | ADH6 | -0.71 | 0.0068 | PITX1 | -1.69 | 0.0180 |
| SERPINH1 | 0.70 | 0.0390 | GSN | -0.71 | 0.0312 | KLK10 | -1.70 | 0.0129 |
| ATR | 0.70 | 0.0090 | MIR22HG | -0.71 | 0.0188 | SFN | -1.71 | 0.0263 |
| ANP32E | 0.70 | 0.0148 | ADK | -0.71 | 0.0206 | CSTB | -1.75 | 0.0009 |
| WBSCR22 | 0.70 | 0.0030 | HMGCS1 | -0.72 | 0.0241 | EPHX3 | -1.77 | 0.0174 |
| FANCL | 0.70 | 0.0018 | SYNGR1 | -0.72 | 0.0213 | SULT2B1 | -1.79 | 0.0153 |
| HMHA1 | 0.70 | 0.0095 | AADAC | -0.72 | 0.0064 | CYP4B1 | -1.81 | 0.0038 |
| ITGBL1 | 0.70 | 0.0123 | PLEC | -0.72 | 0.0008 | AHNAK2 | -1.82 | 0.0055 |
| ATHL1 | 0.70 | 0.0226 | SH3GLB1 | -0.72 | 0.0318 | RAB38 | -1.83 | 0.0069 |
| RBPJ | 0.70 | 0.0170 | PSEN1 | -0.72 | 0.0027 | CDA | -1.83 | 0.0122 |
| NMI | 0.70 | 0.0489 | DDX3X | -0.72 | 0.0206 | NMU | -1.83 | 0.0235 |
| RAB20 | 0.69 | 0.0111 | ARF6 | -0.72 | 0.0247 | GNA15 | -1.83 | 0.0142 |
| CD2 | 0.69 | 0.0069 | TUBB2A | -0.73 | 0.0049 | DUOX1 | -1.85 | 0.0112 |
| MDC1 | 0.69 | 0.0031 | MAST4 | -0.73 | 0.0214 | GPX3 | -1.85 | 0.0008 |
| EGR4 | 0.69 | 0.0223 | GABRE | -0.73 | 0.0192 | ALDH3B2 | -1.87 | 0.0055 |
| HOXB6 | 0.69 | 0.0227 | STK17A | -0.73 | 0.0046 | DEFB1 | -1.87 | 0.0063 |

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|---------|------|--------|---------|-------|--------|----------|-------|--------|
| CEP55 | 0.69 | 0.0187 | CRIP2 | -0.73 | 0.0300 | KRT17 | -1.89 | 0.0289 |
| C6orf48 | 0.69 | 0.0036 | FAM162A | -0.73 | 0.0104 | ALOX12 | -1.89 | 0.0390 |
| PDE4C | 0.69 | 0.0093 | DDIT4 | -0.74 | 0.0072 | SERPINB5 | -1.91 | 0.0162 |
| CDK4 | 0.69 | 0.0097 | CYB5R1 | -0.74 | 0.0075 | KLK12 | -1.92 | 0.0185 |
| IQCK | 0.68 | 0.0138 | ADM | -0.74 | 0.0403 | PI3 | -1.92 | 0.0422 |
| DPY19L4 | 0.68 | 0.0097 | JMJD7 | -0.74 | 0.0170 | FLG | -1.93 | 0.0441 |
| VRK1 | 0.68 | 0.0170 | UGT2B15 | -0.74 | 0.0156 | GLTP | -1.97 | 0.0003 |
| SLC19A1 | 0.68 | 0.0058 | PGAM1 | -0.74 | 0.0006 | KLK11 | -2.00 | 0.0162 |
| TCF7 | 0.68 | 0.0034 | GSTA4 | -0.74 | 0.0425 | GPR87 | -2.02 | 0.0066 |
| BAZ1B | 0.68 | 0.0049 | SQLE | -0.74 | 0.0415 | DEFB4A | -2.03 | 0.0197 |
| THUMPD1 | 0.68 | 0.0184 | H2BFS | -0.74 | 0.0211 | S100A12 | -2.10 | 0.0091 |
| UBE2C | 0.68 | 0.0424 | GALNT14 | -0.75 | 0.0481 | TIAM1 | -2.11 | 0.0042 |
| PLOD3 | 0.67 | 0.0191 | VPS4B | -0.75 | 0.0265 | IL1RN | -2.13 | 0.0123 |
| LUC7L3 | 0.67 | 0.0164 | SUSD4 | -0.75 | 0.0346 | EMP1 | -2.14 | 0.0033 |
| PAIP1 | 0.67 | 0.0357 | IL1A | -0.75 | 0.0471 | ENDOU | -2.16 | 0.0125 |
| DLGAP5 | 0.67 | 0.0060 | ETHE1 | -0.75 | 0.0124 | PKP1 | -2.17 | 0.0068 |
| SF3A2 | 0.67 | 0.0017 | NET1 | -0.76 | 0.0443 | MALL | -2.17 | 0.0039 |
| CEP57 | 0.67 | 0.0084 | SQRDL | -0.76 | 0.0087 | KLK8 | -2.20 | 0.0210 |
| RAB40B | 0.67 | 0.0270 | CES2 | -0.76 | 0.0464 | ECM1 | -2.22 | 0.0057 |
| MICALL2 | 0.67 | 0.0059 | CDHR2 | -0.76 | 0.0280 | CRABP2 | -2.22 | 0.0092 |
| URI1 | 0.66 | 0.0210 | DICER1 | -0.77 | 0.0480 | FABP5 | -2.22 | 0.0016 |
| PPFIBP1 | 0.66 | 0.0183 | ALDH3A2 | -0.77 | 0.0286 | TRIM29 | -2.24 | 0.0067 |

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|----------|------|--------|---------|-------|--------|-----------|-------|--------|
| PPAT | 0.66 | 0.0103 | OBFC1 | -0.77 | 0.0166 | AKR1B10 | -2.25 | 0.0117 |
| PDE4DIP | 0.66 | 0.0019 | ACSL1 | -0.77 | 0.0304 | DSC3 | -2.30 | 0.0030 |
| MCM6 | 0.66 | 0.0113 | RABGGTA | -0.77 | 0.0373 | ZNF750 | -2.31 | 0.0039 |
| COL16A1 | 0.66 | 0.0007 | MALT1 | -0.77 | 0.0132 | SERPINB13 | -2.31 | 0.0125 |
| GUSB | 0.66 | 0.0027 | UBE2G1 | -0.78 | 0.0079 | ZNF185 | -2.34 | 0.0041 |
| RAD51AP1 | 0.66 | 0.0031 | TPM4 | -0.78 | 0.0059 | TMPRSS11D | -2.36 | 0.0028 |
| LSM5 | 0.66 | 0.0030 | VLDLR | -0.78 | 0.0139 | PPP1R3C | -2.39 | 0.0004 |
| IFT57 | 0.66 | 0.0205 | GLUD2 | -0.78 | 0.0083 | TP63 | -2.45 | 0.0011 |
| FUBP1 | 0.66 | 0.0046 | SRD5A1 | -0.78 | 0.0345 | KLK13 | -2.58 | 0.0059 |
| ADAP1 | 0.66 | 0.0240 | RASAL2 | -0.78 | 0.0377 | CLIC3 | -2.66 | 0.0151 |
| TTI1 | 0.65 | 0.0049 | RBFOX2 | -0.78 | 0.0018 | PPL | -2.71 | 0.0021 |
| MCM2 | 0.65 | 0.0056 | ZFYVE21 | -0.79 | 0.0111 | KLK7 | -2.74 | 0.0009 |
| GRB10 | 0.65 | 0.0251 | SNAI2 | -0.79 | 0.0319 | SLURP1 | -2.76 | 0.0065 |
| ENC1 | 0.65 | 0.0087 | ELK3 | -0.79 | 0.0213 | AQP3 | -2.77 | 0.0032 |
| LAGE3 | 0.65 | 0.0009 | MCL1 | -0.79 | 0.0031 | IVL | -2.78 | 0.0022 |
| ICA1 | 0.65 | 0.0089 | RAB14 | -0.79 | 0.0106 | HOPX | -2.80 | 0.0038 |
| CCT6A | 0.65 | 0.0259 | LSS | -0.79 | 0.0035 | CLCA2 | -2.85 | 0.0027 |
| PSMB3 | 0.65 | 0.0433 | TMEM40 | -0.79 | 0.0497 | SPRR2C | -2.85 | 0.0030 |
| TBL2 | 0.64 | 0.0054 | INPP1 | -0.79 | 0.0039 | DSG3 | -2.86 | 0.0022 |
| FBXO11 | 0.64 | 0.0228 | ID1 | -0.80 | 0.0037 | KRT4 | -2.92 | 0.0001 |
| AKAP1 | 0.64 | 0.0459 | PTGDS | -0.80 | 0.0264 | LYPD3 | -2.97 | 0.0017 |
| ADAMDEC1 | 0.64 | 0.0318 | BAG3 | -0.80 | 0.0026 | ANXA1 | -3.12 | 0.0008 |

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|----------|------|--------|---------|-------|--------|-----------|-------|--------|
| DRAM1 | 0.64 | 0.0068 | CLIP1 | -0.80 | 0.0112 | TGM3 | -3.12 | 0.0029 |
| MRE11A | 0.64 | 0.0014 | EIF4E | -0.80 | 0.0049 | FGFBP1 | -3.14 | 0.0006 |
| TGIF1 | 0.64 | 0.0082 | LEPREL1 | -0.80 | 0.0048 | SPINK5 | -3.17 | 0.0046 |
| ARPC1B | 0.64 | 0.0282 | MT1H | -0.81 | 0.0127 | TGM1 | -3.30 | 0.0016 |
| HCP5 | 0.64 | 0.0390 | PLD1 | -0.81 | 0.0422 | CALML3 | -3.36 | 0.0011 |
| MORC2 | 0.63 | 0.0011 | HS3ST1 | -0.81 | 0.0408 | LY6D | -3.37 | 0.0042 |
| TRAPPC6A | 0.63 | 0.0047 | DOCK9 | -0.82 | 0.0345 | SERPINB2 | -3.42 | 0.0021 |
| FANCI | 0.63 | 0.0010 | IL36RN | -0.82 | 0.0279 | S100A8 | -3.54 | 0.0005 |
| FEN1 | 0.63 | 0.0032 | CD59 | -0.82 | 0.0060 | TMPRSS11E | -3.62 | 0.0027 |
| PBXIP1 | 0.63 | 0.0425 | UBE2D3 | -0.82 | 0.0002 | SCEL | -3.62 | 0.0029 |
| MSH6 | 0.63 | 0.0268 | ATP10D | -0.82 | 0.0086 | KRT15 | -3.70 | 0.0014 |
| SLC39A4 | 0.63 | 0.0305 | BDH1 | -0.83 | 0.0124 | CLCA4 | -3.75 | 0.0006 |
| STIL | 0.63 | 0.0036 | ENTPD3 | -0.83 | 0.0078 | KRT16 | -3.86 | 0.0016 |
| RPN2 | 0.63 | 0.0061 | CYP4F3 | -0.83 | 0.0331 | S100A9 | -3.92 | 0.0009 |
| DSCC1 | 0.62 | 0.0013 | ELL2 | -0.83 | 0.0261 | SERPINB3 | -4.05 | 0.0010 |
| CRCP | 0.62 | 0.0262 | ABHD5 | -0.84 | 0.0319 | SERPINB4 | -4.12 | 0.0016 |
| SNX10 | 0.62 | 0.0000 | PPP4R1 | -0.84 | 0.0016 | KRT6B | -4.16 | 0.0011 |
| MKI67 | 0.62 | 0.0189 | CLTB | -0.84 | 0.0080 | CSTA | -4.24 | 0.0004 |
| CDKN3 | 0.62 | 0.0260 | PLIN3 | -0.84 | 0.0255 | S100A2 | -4.24 | 0.0007 |
| PCNA | 0.62 | 0.0111 | RAB5A | -0.85 | 0.0234 | CRCT1 | -4.50 | 0.0007 |
| MTERFD1 | 0.62 | 0.0159 | SASH1 | -0.85 | 0.0082 | MAL | -4.53 | 0.0001 |
| ZNF232 | 0.62 | 0.0126 | COL17A1 | -0.85 | 0.0024 | KRT5 | -4.62 | 0.0005 |

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|-------|------|--------|---------|-------|--------|--------|-------|--------|
| PSMB4 | 0.62 | 0.0015 | PDLIM4 | -0.85 | 0.0244 | SPRR1A | -4.62 | 0.0005 |
| SRSF7 | 0.62 | 0.0302 | DUSP1 | -0.85 | 0.0093 | CRNN | -4.81 | 0.0002 |
| IFI30 | 0.62 | 0.0192 | HOMER2 | -0.86 | 0.0128 | SPRR3 | -4.83 | 0.0001 |
| POT1 | 0.62 | 0.0190 | DNAJB6 | -0.86 | 0.0087 | S100A7 | -4.88 | 0.0002 |
| TPX2 | 0.62 | 0.0286 | ULBP2 | -0.87 | 0.0379 | RHCG | -5.00 | 0.0003 |
| GINS2 | 0.62 | 0.0233 | RND3 | -0.87 | 0.0309 | SPRR1B | -5.26 | 0.0003 |
| ATIC | 0.62 | 0.0051 | ADRB2 | -0.88 | 0.0004 | KRT14 | -5.42 | 0.0002 |
| TAF4 | 0.62 | 0.0020 | CAST | -0.88 | 0.0079 | KRT6A | -5.51 | 0.0001 |
| ETV5 | 0.62 | 0.0037 | GM2A | -0.88 | 0.0253 | KRT13 | -5.63 | 0.0001 |
| LCK | 0.62 | 0.0410 | CYP26B1 | -0.88 | 0.0202 | | | |

Supplementary Table 4 Enriched KEGG pathway and GO terms for DEGs in the intersection of EAC vs. NE group

| | Term | PValue | Fold Enrichment | Genes |
|---|---|--------|--------------------|--|
| Enriched KEGG terms for up-regulated DEGs in the intersection of EAC vs. NE group | Other glycan degradation | 0.0079 | 21.7296 | HEXA, HEXB, MAN2B1 |
| | Glycosaminoglycan degradation | 0.0088 | 20.5859 | HEXA, GUSB, HEXB |
| | ECM-receptor interaction | 0.0000 | 10.4901 | ITGAV, COL1A2, COL1A1, SDC4, LAMB1, ITGB1, COL5A2 |
| | Complement and coagulation cascades | 0.0017 | 9.4476 | A2M, SERPINE1, PLAUI, PLAUR, F2R |
| | Amoebiasis | 0.0011 | 7.3799 | PRKCA, COL1A2, COL1A1, LAMB1, COL5A2, CD14 |
| | Pertussis | 0.0186 | 6.9535 | IRF1, IRF3, ITGB1, CD14 |
| | Transcriptional misregulation in cancer | 0.0002 | 6.2084 | PDGFA, MMP9, PPARG, MET, HMGA2, IGFBP3, CD14, PLAUI |
| | NF-kappa B signaling pathway | 0.0274 | 5.9944 | ICAM1, RELB, CD14, PLAUI |
| | Proteoglycans in cancer | 0.0001 | 5.8670 | PRKCA, PTPN6, ITGAV, MMP9, MET, SDC4, ITGB1, PLAUI, PLAUR |
| | Focal adhesion | 0.0001 | 5.6961 | PRKCA, PDGFA, ITGAV, MET, COL1A2, COL1A1, LAMB1, ITGB1, COL5A2 |
| | Leukocyte transendothelial migration | 0.0116 | 5.5245 | PRKCA, ICAM1, MMP9, PECAM1, ITGB1 |
| | Lysosome | 0.0127 | 5.3875 | HEXA, GUSB, HEXB, GALC, MAN2B1 |
| | Platelet activation | 0.0161 | 5.0145 | COL1A2, COL1A1, ITGB1, COL5A2, F2R |
| | Cell adhesion molecules (CAMs) | 0.0216 | 4.5908 | ICAM1, ITGAV, PECAM1, SDC4, ITGB1 |
| | PI3K-Akt signaling pathway | 0.0009 | 3.7791 | PRKCA, PDGFA, ITGAV, MET, COL1A2, COL1A1, |

| | | | | |
|--------------|---|--------|----------|---|
| | | | | LAMB1, ITGB1, COL5A2, F2R |
| | Pathways in cancer | 0.0024 | 3.3175 | PRKCA, PDGFA, ITGAV, MMP9, PPARG, MET, STAT1, LAMB1, ITGB1, F2R |
| | MicroRNAs in cancer | 0.0193 | 3.2023 | PRKCA, PDGFA, MMP9, SOCS1, MET, HMGA2, PLAU |
| Enriched | chronological cell aging | 0.0074 | 266.5397 | SERPINE1, ENG |
| GO_BP terms | cellular response to vitamin E | 0.0074 | 266.5397 | PPARG, COL1A1 |
| for | negative regulation of lipid transport | 0.0147 | 133.2698 | ITGAV, NR1H3 |
| up-regulated | negative regulation of interferon-gamma-mediated signaling pathway | 0.0183 | 106.6159 | PPARG, NR1H3 |
| DEGs in the | negative regulation of cysteine-type endopeptidase activity involved in apoptotic signaling pathway | 0.0183 | 106.6159 | MMP9, PLAUR |
| intersection | regulation of smooth muscle cell migration | 0.0183 | 106.6159 | PDGFA, PLAU |
| EAC vs. NE | response to corticosteroid | 0.0220 | 88.8466 | COL1A1, ENG |
| group | macrophage derived foam cell differentiation | 0.0220 | 88.8466 | PPARG, STAT1 |
| | negative regulation of cholesterol storage | 0.0220 | 88.8466 | PPARG, NR1H3 |
| | positive regulation of receptor binding | 0.0220 | 88.8466 | MMP9, HFE |
| | negative regulation of platelet activation | 0.0292 | 66.6349 | APOE, PDGFA |
| | negative regulation of macrophage derived foam cell differentiation | 0.0010 | 61.5092 | ITGAV, PPARG, NR1H3 |

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|--|--------|---------|------------------------------------|
| skin morphogenesis | 0.0328 | 59.2310 | COL1A2, COL1A1 |
| regulation of receptor activity | 0.0328 | 59.2310 | SERPINE1, PLAU |
| protein heterotrimerization | 0.0012 | 57.1156 | COL1A2, COL1A1, SKIL |
| hyaluronan catabolic process | 0.0014 | 53.3079 | HEXA, GUSB, HEXB |
| cell adhesion mediated by integrin | 0.0014 | 53.3079 | ICAM1, ITGAV, ITGB1 |
| endothelial cell morphogenesis | 0.0399 | 48.4618 | PECAM1, MET |
| cell activation | 0.0399 | 48.4618 | PDGFA, TIMP1 |
| oligosaccharide catabolic process | 0.0399 | 48.4618 | HEXB, MAN2B1 |
| mesodermal cell differentiation | 0.0399 | 48.4618 | HMGA2, ITGB1 |
| negative regulation of blood coagulation | 0.0434 | 44.4233 | APOE, SERPINE1 |
| keratan sulfate catabolic process | 0.0434 | 44.4233 | HEXA, HEXB |
| long-chain fatty acid transport | 0.0434 | 44.4233 | APOE, PPARG |
| regulation of interferon-gamma-mediated signaling pathway | 0.0470 | 41.0061 | SOCS1, STAT1 |
| endodermal cell differentiation | 0.0001 | 39.4874 | ITGAV, MMP9, HMGA2, LAMB1 |
| fibrinolysis | 0.0027 | 38.0771 | SERPINE1, PLAU, PLAUR |
| leukocyte cell-cell adhesion | 0.0038 | 31.9848 | ICAM1, NT5E, ITGB1 |
| negative regulation of endothelial cell proliferation | 0.0051 | 27.5731 | APOE, STAT1, ENG |
| cellular response to amino acid stimulus | 0.0007 | 22.6842 | SOCS1, COL1A2, COL1A1, COL5A2 |
| blood vessel development | 0.0087 | 21.0426 | ITGAV, COL1A2, COL1A1 |
| collagen catabolic process | 0.0001 | 20.8234 | MMP9, COL1A2, MMP7, COL1A1, COL5A2 |

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|---|--------|---------|---|
| response to cytokine | 0.0009 | 20.5031 | RELB, SKIL, STAT1, TIMP1 |
| collagen fibril organization | 0.0091 | 20.5031 | COL1A2, COL1A1, COL5A2 |
| interferon-gamma-mediated signaling pathway | 0.0001 | 18.7704 | ICAM1, IRF1, IRF3, STAT1, GBP1 |
| response to peptide hormone | 0.0115 | 18.1732 | COL1A1, STAT1, TIMP1 |
| glycosphingolipid metabolic process | 0.0120 | 17.7693 | HEXA, HEXB, GALC |
| extracellular matrix disassembly | 0.0002 | 17.5355 | A2M, MMP9, MMP7, ENG, TIMP1 |
| leukocyte migration | 0.0000 | 17.4780 | ICAM1, PTPN6, ITGAV, MMP9, PECAM1, COL1A2, COL1A1, ITGB1 |
| wound healing | 0.0002 | 16.6587 | PDGFA, PECAM1, SDC4, ENG, TIMP1 |
| type I interferon signaling pathway | 0.0017 | 16.6587 | EGR1, IRF1, IRF3, STAT1 |
| regulation of cellular amino acid metabolic process | 0.0152 | 15.6788 | ODC1, NQO1, PSMB9 |
| positive regulation of type I interferon production | 0.0152 | 15.6788 | IRF1, IRF3, CD14 |
| cellular response to mechanical stimulus | 0.0023 | 15.0163 | IRF1, MMP7, COL1A1, ENG |
| BMP signaling pathway | 0.0028 | 14.0284 | EGR1, HFE, SMURF2, ENG |
| extracellular matrix organization | 0.0000 | 13.5990 | ICAM1, PDGFA, ITGAV, PECAM1, SERPINE1, COL1A2, COL1A1, LAMB1, ITGB1, COL5A2 |
| platelet degranulation | 0.0006 | 12.9388 | A2M, PDGFA, PECAM1, SERPINE1, TIMP1 |
| negative regulation of transforming growth factor beta receptor signaling | 0.0234 | 12.4940 | SMURF2, SKIL, ENG |

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|--|--------|---------|--|--|
| pathway | | | | |
| positive regulation of | 0.0240 | 12.3018 | PTPN6, PDGFA, F2R | |
| phosphatidylinositol 3-kinase signaling | | | | |
| platelet activation | 0.0009 | 11.5887 | PRKCA, PTPN6, COL1A2, COL1A1, F2R | |
| transforming growth factor beta receptor | | | | |
| signaling pathway | 0.0048 | 11.5887 | COL1A2, SKIL, ENG, ITGB1 | |
| response to nutrient | 0.0306 | 10.8057 | PPARG, STAT1, NQO1 | |
| cellular response to insulin stimulus | 0.0329 | 10.3847 | UCP2, PPARG, STAT1 | |
| positive regulation of cell migration | 0.0001 | 10.1401 | PRKCA, PDGFA, ITGAV, COL1A1, LAMB1, PLAUI, F2R | |
| negative regulation of inflammatory | | | | |
| response | 0.0345 | 10.1218 | APOE, NT5E, NR1H3 | |
| viral entry into host cell | 0.0353 | 9.9952 | ICAM1, ITGAV, ITGB1 | |
| positive regulation of MAPK cascade | 0.0361 | 9.8718 | PDGFA, IGFBP3, F2R | |
| skeletal system development | 0.0016 | 9.7277 | MMP9, HEXB, COL1A2, COL1A1, COL5A2 | |
| cellular response to lipopolysaccharide | 0.0084 | 9.4350 | ICAM1, SERPINE1, CD14, NR1H3 | |
| blood coagulation | 0.0006 | 8.6915 | COL1A2, IRF1, COL1A1, PLAUI, PLAU, F2R | |
| cellular calcium ion homeostasis | 0.0463 | 8.5981 | APOE, ATP2A3, HEXB | |
| carbohydrate metabolic process | 0.0039 | 7.6592 | HEXA, GUSB, HEXB, GALC, MAN2B1 | |
| regulation of immune response | 0.0042 | 7.4871 | ICAM1, COL1A2, IRF1, COL1A1, ITGB1 | |
| defense response to virus | 0.0231 | 6.4616 | IRF1, IRF3, STAT1, GBP1 | |
| aging | 0.0231 | 6.4616 | UCP2, MMP7, NQO1, TIMP1 | |
| response to hypoxia | 0.0257 | 6.1986 | EGR1, UCP2, ENG, PLAUI | |

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|--------------|--|--------|----------|---|
| | cell migration | 0.0257 | 6.1986 | ITGAV, SDC4, ENG, ITGB1 |
| | positive regulation of ERK1 and ERK2 cascade | 0.0269 | 6.0923 | PRKCA, ICAM1, PDGFA, F2R |
| | angiogenesis | 0.0093 | 5.9762 | PRKCA, PDGFA, ITGAV, PECAM1, SERPINE1 |
| | regulation of apoptotic process | 0.0441 | 5.0054 | EGR1, SKIL, STAT1, IGFBP3 |
| | cell adhesion | 0.0015 | 4.6456 | PRKCA, ICAM1, DSG2, ITGAV, PECAM1, COL1A1, LAMB1, ENG |
| | response to drug | 0.0259 | 4.3839 | ICAM1, TOP1, PPARG, COL1A1, STAT1 |
| | positive regulation of transcription, DNA-templated | 0.0028 | 4.1404 | EGR1, PPARG, IRF1, COL1A1, HMGA2, STAT1, NR1H3, F2R |
| | negative regulation of cell proliferation | 0.0153 | 4.0385 | CXCL1, RARRES3, PTPN6, IRF1, IGFBP3, F2R |
| | positive regulation of cell proliferation | 0.0073 | 4.0038 | ODC1, PTPN6, PDGFA, ITGAV, ITGB1, TIMP1, F2R |
| | negative regulation of apoptotic process | 0.0261 | 3.5148 | UCP2, MMP9, HMGA2, NQO1, TIMP1, PLAUR |
| | negative regulation of transcription from RNA polymerase II promoter | 0.0048 | 3.3317 | EGR1, RELB, PPARG, SMURF2, SKIL, HMGA2, STAT1, ENG, NR1H3 |
| | positive regulation of transcription from RNA polymerase II promoter | 0.0008 | 3.2604 | EGR1, HEXB, RELB, SERPINE1, PPARG, MET, IRF1, HMGA2, STAT1, MYBL2, ENG, NR1H3 |
| Enriched | collagen type I trimer | 0.0068 | 289.2698 | COL1A2, COL1A1 |
| GO_CC | invadopodium membrane | 0.0202 | 96.4233 | ITGB1, PLAUR |
| terms for | azurophil granule | 0.0368 | 52.5945 | HEXA, HEXB |
| up-regulated | platelet alpha granule lumen | 0.0009 | 21.0378 | A2M, PDGFA, SERPINE1, TIMP1 |
| DEGs in the | lysosomal lumen | 0.0000 | 20.4190 | HEXA, GUSB, HEXB, GALC, SDC4, MAN2B1 |

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|------------------|------------------------------------|--------|---------|---|
| EAC vs. NE group | intersection of collagen trimer | 0.0038 | 12.5769 | COL1A2, COL1A1, COL5A2, TIMP1 |
| | membrane raft | 0.0007 | 8.4253 | ICAM1, PECAM1, SMURF2, SDC4, ITGB1, CD14 |
| | external side of plasma membrane | 0.0008 | 8.1484 | ICAM1, ITGAV, PECAM1, HFE, ENG, ITGB1 |
| | endoplasmic reticulum lumen | 0.0041 | 7.5331 | PDGFA, COL1A2, COL1A1, COL5A2, PLAUR |
| | cell surface | 0.0000 | 6.9382 | ICAM1, DSG2, PDGFA, ITGAV, MET, MMP7, CFTR, SDC4, NT5E, ENG, ITGB1, PLAU, F2R |
| | extracellular matrix | 0.0005 | 6.8408 | APOE, SERPINE1, COL1A2, MMP7, COL1A1, LAMB1, COL5A2 |
| | proteinaceous extracellular matrix | 0.0131 | 5.3968 | MMP9, COL1A2, MMP7, COL5A2, TIMP1 |
| | focal adhesion | 0.0021 | 5.1787 | ICAM1, ITGAV, SDC4, ENG, ITGB1, PLAU, PLAUR |
| | early endosome | 0.0431 | 5.0527 | APOE, HFE, CFTR, F2R |
| | extracellular space | 0.0000 | 4.5098 | CXCL1, ICAM1, PDGFA, GUSB, MMP9, HEXB, MMP7, HFE, TIMP1, APOE, PECAM1, SERPINE1, COL1A2, COL1A1, MUC5AC, MAN2B1, LAMB1, IGFBP3, ENG, CD14, PLAU |
| | extracellular region | 0.0000 | 3.5934 | ADAM28, CXCL1, A2M, PDGFA, MMP9, MET, MMP7, COL5A2, TIMP1, APOE, SERPINE1, COL1A2, COL1A1, MUC5AC, LAMB1, IGFBP3, CD14, PLAU, GBP1, F2R |
| | perinuclear region of cytoplasm | 0.0187 | 3.2607 | PRKCA, ODC1, PPARG, HFE, STAT1, LAMB1, ITGB1 |
| | extracellular exosome | 0.0000 | 3.1901 | A2M, HEXA, MMP9, HEXB, MMP7, SDC4, ITGB1, TIMP1, APOE, ITGAV, SERPINE1, GALC, MAN2B1, NQO1, LAMB1, NT5E, PRKCA, ICAM1, PTPN6, ST6GAL1, GUSB, |

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|--------------|---|--------|---------|---|
| | | | | CFTR, PSMB9, PLAUR, DSG2, PECAM1, COL1A2, MUC5AC, IGFBP3, PLAU, CD14 |
| | integral component of plasma membrane | 0.0489 | 2.0443 | ICAM1, ATP2A3, ITGAV, MET, TAP1, HFE, SDC4, SLC19A1, PLAUR, F2R |
| | nucleoplasm | 0.0216 | 1.7664 | PRKCA, EGR1, PPARG, RELB, HMGA2, MYBL2, STAT1, MTRR, PSMB9, TOP1, HOXB7, IRF1, SMURF2, IRF3, SKIL, ENG, NR1H3 |
| Enriched | SMAD binding | 0.0000 | 31.1573 | COL1A2, SMURF2, SKIL, HMGA2, COL5A2 |
| GO_MF | extracellular matrix structural constituent | 0.0001 | 19.9964 | COL1A2, COL1A1, MUC5AC, LAMB1, COL5A2 |
| terms for | fibronectin binding | 0.0001 | 41.2234 | ITGAV, SDC4, IGFBP3, ITGB1 |
| up-regulated | | | | RARRES3, A2M, PDGFA, MMP9, PPARG, HFE, SDC4, MYBL2, ITGB1, TIMP1, TOP1, APOE, ITGAV, TAP1, SERPINE1, SKIL, NQO1, NR1H3, PRKCA, EGR1, ICAM1, |
| DEGs in the | | | | ODC1, PTPN6, ST6GAL1, MET, RELB, SOCS1, CFTR, STAT1, HMGA2, MTRR, PLAUR, PSMB9, HOXB7, UCP2, PECAM1, COL1A2, IRF1, IRF3, SMURF2, COL1A1, ENG, IGFBP3, PLAU, CD14, GBP1, F2R |
| intersection | protein binding | 0.0003 | 1.4336 | A2M, ITGAV, SERPINE1, ITGB1, TIMP1 |
| of | | | | PDGFA, COL1A2, COL1A1 |
| EAC vs. NE | | | | IRF1, IRF3, HMGA2 |
| group | protease binding | 0.0005 | 13.2650 | PRKCA, A2M, PPARG, CFTR, STAT1, GBP1, PLAUR |
| | platelet-derived growth factor binding | 0.0007 | 73.0779 | APOE, MMP9, PPARG, COL1A2, SMURF2, IRF3, COL1A1, |
| | regulatory region DNA binding | 0.0009 | 66.9881 | |
| | enzyme binding | 0.0014 | 5.6326 | |
| | identical protein binding | 0.0016 | 3.5775 | |

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|-------------|---|--------|----------|---|
| | | | | STAT1, NQO1, GBP1 |
| | receptor binding | 0.0018 | 5.3135 | CXCL1, A2M, GUSB, SERPINE1, HFE, PLAUR, F2R |
| | RNA polymerase II core promoter proximal region sequence-specific DNA binding | 0.0097 | 4.5288 | IRF1, IRF3, SKIL, STAT1, MYBL2, NR1H3 |
| | beta-N-acetylhexosaminidase activity | 0.0110 | 178.6349 | HEXA, HEXB |
| | transcriptional activator activity, RNA polymerase II core promoter proximal region sequence-specific binding | 0.0110 | 5.6770 | EGR1, IRF1, HMGA2, MYBL2, NR1H3 |
| | protein homodimerization activity | 0.0172 | 2.9365 | ODC1, APOE, PDGFA, HEXB, TAP1, IRF3, STAT1, ENG |
| | C-X3-C chemokine binding | 0.0182 | 107.1810 | ITGAV, ITGB1 |
| | cell adhesion molecule binding | 0.0218 | 12.9654 | PTPN6, DSG2, ITGB1 |
| | transcription factor activity, sequence-specific DNA binding | 0.0237 | 2.5094 | EGR1, HOXB7, RELB, PPARG, IRF1, IRF3, STAT1, MYBL2, NR1H3 |
| | virus receptor activity | 0.0273 | 11.4837 | ICAM1, ITGAV, ITGB1 |
| | insulin-like growth factor I binding | 0.0432 | 44.6587 | ITGAV, IGFBP3 |
| Enriched | Bladder cancer | 0.0181 | 14.0447 | MAPK1, HRAS, FGFR3 |
| KEGG terms | Fatty acid degradation | 0.0206 | 13.0871 | ACOX1, ALDH3A2, ACAA1 |
| for | Valine, leucine and isoleucine degradation | 0.0234 | 12.2518 | BCKDHA, ALDH3A2, ACAA1 |
| down- | Non-small cell lung cancer | 0.0324 | 10.2827 | MAPK1, HRAS, TGFA |
| regulated | Acute myeloid leukemia | 0.0324 | 10.2827 | MAPK1, HRAS, PIM1 |
| DEGs in the | VEGF signaling pathway | 0.0379 | 9.4399 | MAPK1, HRAS, HSPB1 |

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|--|--|--------|---------|-------------------------------------|
| intersection of EAC vs. NE group | Central carbon metabolism in cancer | 0.0413 | 8.9974 | MAPK1, HRAS, FGFR3 |
| | Renal cell carcinoma | 0.0425 | 8.8590 | MAPK1, HRAS, TGFA |
| | Glioma | 0.0425 | 8.8590 | MAPK1, HRAS, TGFA |
| | Pancreatic cancer | 0.0425 | 8.8590 | MAPK1, TGFA, SMAD2 |
| | PPAR signaling pathway | 0.0449 | 8.5945 | ACOX1, DBI, ACAA1 |
| | Fc epsilon RI signaling pathway | 0.0461 | 8.4681 | FCER1A, MAPK1, HRAS |
| | Adherens junction | 0.0498 | 8.1103 | MAPK1, SMAD2, SNAI2 |
| | Signaling pathways regulating pluripotency of stem cells | 0.0332 | 5.4841 | MAPK1, HRAS, FGFR3, SMAD2 |
| | Biosynthesis of antibiotics | 0.0214 | 4.5270 | BCKDHA, TALDO1, OAT, ALDH3A2, ACAA1 |
| Enriched GO_BP terms for down-regulated DEGs in the intersection of EAC vs. NE group | MAPK signaling pathway | 0.0387 | 3.7636 | MAPK1, HRAS, FGFR3, MAPT, HSPB1 |
| | common myeloid progenitor cell proliferation | 0.0231 | 84.1704 | GSTP1, CEACAM1 |
| | regulation of stress-activated MAPK cascade | 0.0264 | 73.6491 | MAPK1, GSTP1 |
| | negative regulation of vascular smooth muscle cell proliferation | 0.0264 | 73.6491 | HMOX1, GSTP1 |
| | regulation of ossification | 0.0361 | 53.5630 | MAPK1, PBX1 |
| | hemidesmosome assembly | 0.0393 | 49.0994 | KRT5, KRT14 |
| | fatty acid beta-oxidation using acyl-CoA oxidase | 0.0425 | 45.3225 | ACOX1, ACAA1 |
| | alpha-linolenic acid metabolic process | 0.0425 | 45.3225 | ACOX1, ACAA1 |
| | | | | |

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|--|--------|---------|-------------------------------------|
| very long-chain fatty acid metabolic process | 0.0457 | 42.0852 | ACOX1, ACAA1 |
| fatty acid oxidation | 0.0457 | 42.0852 | ACOX1, ADIPOR1 |
| hair cycle | 0.0489 | 39.2795 | KRT16, KRT14 |
| negative regulation of sequence-specific DNA binding transcription factor activity | 0.0011 | 19.6398 | HMOX1, PIM1, PBX1, PRNP |
| keratinization | 0.0112 | 18.4123 | KRT16, PPL, TGM1 |
| epidermis development | 0.0002 | 17.3292 | KRT5, KRT16, CRABP2, KRT14, ALDH3A2 |
| keratinocyte differentiation | 0.0021 | 15.5051 | FLG, KRT16, TGM1, CSTA |
| epithelial cell differentiation | 0.0228 | 12.6256 | KRT14, KRT4, AKR1C1 |
| palate development | 0.0266 | 11.6288 | TFAP2A, SMAD2, SNAI2 |
| xenobiotic metabolic process | 0.0279 | 11.3306 | RORA, GSTP1, AKR1C1 |
| regulation of phosphatidylinositol 3-kinase signaling | 0.0279 | 11.3306 | MAPK1, FGFR3, CEACAM1 |
| anterior/posterior pattern specification | 0.0292 | 11.0474 | RARG, SMAD2, PBX1 |
| response to toxic substance | 0.0327 | 10.3975 | MAPK1, SLC6A4, GSTP1 |
| negative regulation of protein kinase activity | 0.0431 | 8.9272 | HSPB1, GSTP1, CEACAM1 |
| single organismal cell-cell adhesion | 0.0447 | 8.7504 | SRPX2, DSG1, CSTA |
| cytoskeleton organization | 0.0165 | 7.3192 | KRT5, KRT16, PPL, KRT4 |
| protein homooligomerization | 0.0212 | 6.6575 | HMOX1, SLC6A4, PRNP, AKR1C1 |
| angiogenesis | 0.0065 | 6.6053 | SRPX2, HMOX1, TGFA, RORA, CEACAM1 |

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|--|--|--------|----------|---|
| | negative regulation of apoptotic process | 0.0008 | 5.1797 | RARG, PIM1, SERPINB2, TGFA, TFAP2A, HSPB1, PRNP, GSTP1 |
| | positive regulation of cell proliferation | 0.0193 | 3.7931 | MAPK1, HRAS, FGFR3, RARG, TGFA, PBX1 |
| | negative regulation of cell proliferation | 0.0428 | 3.7197 | HRAS, RARG, TFAP2A, SMAD2, SMARCA2 |
| | positive regulation of transcription from RNA polymerase II promoter | 0.0049 | 3.0030 | HLF, HRAS, RARG, LMO2, TFAP2A, SMAD2, PBX1, TFAP2C, RORA, SMARCA2 |
| Enriched GO_CC terms for down-regulated DEGs in the intersection of EAC vs. NE group | hydrogen:potassium-exchanging ATPase complex | 0.0061 | 319.7193 | GM2A, ATP12A |
| | desmosome | 0.0025 | 39.9649 | DSG3, PPL, DSG1 |
| | peroxisomal membrane | 0.0120 | 17.7622 | ACOX1, PEX3, ALDH3A2 |
| | intermediate filament | 0.0004 | 14.1469 | KRT5, FLG, KRT16, KRT14, KRT4 |
| | peroxisome | 0.0040 | 12.2969 | ACOX1, PEX3, ALDH3A2, ACAA1 |
| | keratin filament | 0.0379 | 9.5916 | KRT5, KRT14, KRT4 |
| | transcription factor complex | 0.0215 | 6.6263 | RARG, LMO2, SMAD2, PBX1 |
| | nuclear chromatin | 0.0215 | 6.6263 | RARG, SMAD2, SNAI2, SMARCA2 |
| | intracellular membrane-bounded organelle | 0.0000 | 5.7297 | ACOX1, HRAS, TALDO1, FLG, TFAP2A, PEX3, ATP12A, SMARCA2, ALDH3A2, ACAA1 |
| | cell surface | 0.0062 | 4.1292 | FCER1A, FGFR3, SRPX2, TGFA, KRT4, PRNP, CEACAM1 |
| | mitochondrion | 0.0021 | 2.8825 | BCKDHA, MAPK1, ACOX1, KRT5, CYP11A1, GM2A, PPL, GLUD1, TFAP2C, PRNP, OAT, GSTP1 |
| | endoplasmic reticulum | 0.0408 | 2.7029 | AGA, FGFR3, HMOX1, CRABP2, PEX3, PRNP, DBI |
| | extracellular exosome | 0.0002 | 2.3885 | AGA, TALDO1, GM2A, CRABP2, DBI, ALDH3A2, MAPK1, |

| | | | | |
|--------------|---|--------|----------|--|
| | cytosol | 0.0035 | 1.9289 | KRT5, DSG3, KRT16, PPL, KRT14, DSG1, TGM1, TOM1, HSPB1, CSTA, PRNP, CEACAM1, AKR1C1, GSTP1 HRAS, IMPA2, TALDO1, CRABP2, SLC6A4, SMAD2, PEX3, ETF1, CALB2, MAPK1, KRT5, DSG3, HMOX1, MAPT, KRT14, DSG1, TOM1, HSPB1, AKR1C1, GSTP1 ACOX1, HLF, HRAS, TALDO1, FGFR3, LMO2, CRABP2, RORA, CALB2, HOXA4, KRT5, PPL, HMOX1, TGFA, KRT4, RARG, PIM1, SMAD2, SNAI2, ETF1, MAPK1, KRT16, FLG, KRT14, HSPB1, TFAP2A, PBX1, TFAP2C, CSTA, PRNP, SMARCA2, GSTP1 |
| | nucleus | 0.0001 | 1.8894 | FCER1A, ACOX1, HRAS, FGFR3, SLC6A4, PIM1, ADIPOR1, ATP12A, KRT5, DSG3, HMOX1, PPL, MAPT, DSG1, SERPINB2, TGFA, HSPB1, SLC13A4, PRNP, CEACAM1, GSTP1 |
| | plasma membrane | 0.0177 | 1.6292 | ACOX1, ACAA1 |
| Enriched | palmitoyl-CoA oxidase activity | 0.0099 | 197.4386 | KRT5, KRT16, MAPT, PPL, KRT14 |
| GO_MF | structural constituent of cytoskeleton | 0.0005 | 13.4617 | TFAP2A, TFAP2C, PEX3, DBI, CEACAM1 |
| terms for | protein dimerization activity | 0.0015 | 9.8719 | KRT5, FLG, KRT16, KRT14, KRT4, CSTA |
| down- | structural molecule activity | 0.0013 | 7.1941 | HLF, RARG, LMO2, TFAP2C, RORA |
| regulated | RNA polymerase II regulatory region | 0.0050 | 7.1192 | HLF, TFAP2A, SMAD2, PBX1, TFAP2C |
| DEGs in the | sequence-specific DNA binding | 0.0077 | 6.2745 | |
| intersection | transcriptional activator activity, RNA | | | |
| of | polymerase II core promoter proximal | | | |

| | | | | |
|------------|--|--------|--------|---|
| EAC vs. NE | region sequence-specific binding | | | |
| group | transcription factor binding | 0.0145 | 5.2140 | MAPK1, PIM1, SMAD2, PBX1, RORA |
| | sequence-specific DNA binding | 0.0072 | 4.0021 | HLF, RARG, HOXA4, TFAP2A, PBX1, RORA, SNAI2 |
| | identical protein binding | 0.0370 | 2.7678 | MAPK1, SRPX2, GLUD1, ADIPOR1, HSPB1, PRNP, OAT |
| | transcription factor activity, sequence-specific DNA binding | 0.0387 | 2.4654 | HLF, RARG, HOXA4, TFAP2A, SMAD2, PBX1, TFAP2C, RORA |
| | | | | HRAS, IMPA2, TALDO1, FGFR3, LMO2, GLUD1, CRABP2, SLC6A4, PEX3, RORA, KRT5, PPL, HMOX1, MAPT, TGM1, TGFA, KRT4, AKR1C1, CEACAM1, BCKDHA, RARG, PIM1, SMAD2, ETF1, SNAI2, MAPK1, SRPX2, KRT16, FLG, KRT14, DSG1, TFAP2A, HSPB1, TOM1, PBX1, TFAP2C, PRNP, SMARCA2, GSTP1, ACAA1 |
| | protein binding | 0.0056 | 1.3485 | |

Supplementary Table 5 Enriched KEGG pathway and GO terms for DEGs in the intersection of BE vs. NE group

| | Term | PValue | Fold | Genes |
|--|---|--------|------------|---------------------------|
| | | | | |
| | | | Enrichment | |
| Enriched KEGG terms for up-regulated DEGs in the intersection of BE vs. NE group | PPAR signaling pathway | 0.0048 | 25.7836 | PPARG, MMP1, NR1H3 |
| | Osteoclast differentiation | 0.0010 | 17.5827 | FOS, SOCS3, TGFBR2, PPARG |
| | Pathways in cancer | 0.0214 | 5.8609 | FOS, TGFBR2, PPARG, MMP1 |
| Enriched GO_BP terms for up-regulated DEGs in the intersection of BE vs. NE group | negative regulation of interferon-gamma-mediated signaling pathway | 0.0048 | 395.1059 | PPARG, NR1H3 |
| | negative regulation of cholesterol storage | 0.0057 | 329.2549 | PPARG, NR1H3 |
| | negative regulation of macrophage derived foam cell differentiation | 0.0123 | 151.9638 | PPARG, NR1H3 |
| | positive regulation of osteoclast differentiation | 0.0180 | 103.9752 | FOS, CA2 |
| | response to steroid hormone | 0.0189 | 98.7765 | TGFBR2, CA2 |
| | response to immobilization stress | 0.0198 | 94.0728 | FOS, PPARG |
| | response to cold | 0.0338 | 54.8758 | FOS, PPARG |
| | lipid homeostasis | 0.0365 | 50.6546 | PPARG, NR1H3 |
| | response to progesterone | 0.0365 | 50.6546 | FOS, NR1H3 |
| | response to estrogen | 0.0017 | 45.5891 | TGFBR2, PPARG, CA2 |
| | organ regeneration | 0.0439 | 42.0325 | TGFBR2, PPARG |
| | regulation of circadian rhythm | 0.0457 | 40.3169 | PPARG, NR1H3 |
| | response to nutrient | 0.0022 | 40.0445 | TGFBR2, PPARG, NQO1 |

| | | | | | |
|---|-------|--|--------|---------|--|
| | | extracellular matrix disassembly | 0.0023 | 38.9907 | A2M, MMP1, TIMP1 |
| | | response to cytokine | 0.0484 | 37.9910 | FOS, TIMP1 |
| | | regulation of growth | 0.0493 | 37.2741 | SOCS3, TGFBR2 |
| | | transforming growth factor beta receptor signaling pathway | 0.0034 | 32.2097 | FOS, TGFBR2, GDF15 |
| | | aging | 0.0000 | 29.9323 | FOS, UCP2, TGFBR2, NQO1, TIMP1 |
| | | negative regulation of apoptotic process | 0.0000 | 13.0255 | KRT18, SOCS3, UCP2, NQO1, TIMP1, PLAUR |
| | | response to drug | 0.0332 | 9.7477 | FOS, TGFBR2, PPARG |
| Enriched terms for up-regulated DEGs in the intersection of BE vs. NE group | GO_CC | RNA polymerase II transcription factor complex | 0.0286 | 64.9697 | PPARG, NR1H3 |
| | | platelet alpha granule lumen | 0.0472 | 38.9818 | A2M, TIMP1 |
| | | extracellular exosome | 0.0013 | 3.4322 | A2M, KRT18, REG1A, ANPEP, CA2, GDF15, NQO1, TIMP1, PLAUR |
| | | extracellular region | 0.0467 | 3.3292 | A2M, GDF15, MMP1, GBP1, TIMP1 |
| | | cytosol | 0.0038 | 2.9104 | FOS, A2M, SOCS3, TGFBR2, PPARG, ANPEP, CA2, NQO1, GBP1 |
| Enriched terms | GO_MF | enzyme binding | 0.0035 | 11.9279 | A2M, PPARG, GBP1, PLAUR |
| | | growth factor activity | 0.0101 | 18.3889 | REG1A, GDF15, TIMP1 |

| | | | | |
|---|--|--------|----------|---|
| for up-regulated DEGs in the intersection of BE vs. NE group | protein binding | 0.0161 | 1.5825 | A2M, SOCS3, PPARG, TGFBR2, TIMP1, PLAUR, FOS, KRT18, UCP2, CA2, NQO1, GDF15, GBP1, NR1H3 |
| | transcription regulatory region DNA binding | 0.0169 | 13.9859 | FOS, PPARG, NR1H3 |
| | zinc ion binding | 0.0213 | 4.2472 | PPARG, ANPEP, CA2, MMP1, NR1H3 |
| | RNA polymerase II transcription factor activity, ligand-activated sequence-specific DNA binding | 0.0336 | 55.1667 | PPARG, NR1H3 |
| Enriched GO_BP terms for down-regulated DEGs in the intersection of BE vs. NE group | steroid hormone mediated signaling pathway | 0.0135 | 117.8386 | RORA, BMP7 |
| | cellular response to hypoxia | 0.0227 | 69.9667 | RORA, BMP7 |