

Supplementary Table S1 The list for the commonly changed transcripts in both datasets of RNA-Sequencing analysis on DBC1 knockdown cells and BLM knockdown cells, related to Fig. 3A.

| Genes differentially expressed in shDBC1 cells (p<0.05; log2FoldChang>1) | | | | |
|---|------------------|-----------------------|----------------|---------------------|
| Gene_id | Gene_name | log2FoldChange | P value | Gene_biotype |
| ENSG00000260287 | TBC1D3G | -7.811398504 | 1.09E-06 | protein_coding |
| ENSG00000189001 | SBSN | -7.06091978 | 0.000193974 | protein_coding |
| ENSG00000077080 | ACTL6B | -6.525254434 | 0.002434933 | protein_coding |
| ENSG00000237330 | RNF223 | -6.389316369 | 0.004174171 | protein_coding |
| ENSG00000214402 | LCNL1 | -6.23922431 | 0.007243414 | protein_coding |
| ENSG00000162006 | MSLNL | -6.23922431 | 0.007243414 | protein_coding |
| ENSG00000166592 | RRAD | -6.23922431 | 0.007243414 | protein_coding |
| ENSG00000283189 | AC104452.1 | -6.071684547 | 0.012730848 | protein_coding |
| ENSG00000070731 | ST6GALNAC2 | -6.071684547 | 0.012730848 | protein_coding |
| ENSG00000135114 | OASL | -5.882100421 | 0.022676824 | protein_coding |
| ENSG00000126856 | PRDM7 | -5.882100421 | 0.022676824 | protein_coding |
| ENSG00000284820 | AC068946.2 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000130173 | ANGPTL8 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000157087 | ATP2B2 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000104879 | CKM | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000169393 | ELSPBP1 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000151948 | GLT1D1 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000150782 | IL18 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000005844 | ITGAL | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000243709 | LEFTY1 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000283654 | LMLN2 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000139679 | LPAR6 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000102854 | MSLN | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000170476 | MZB1 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000179256 | SMCO3 | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000269404 | SPIB | -5.663779193 | 0.040964585 | protein_coding |
| ENSG00000120738 | EGR1 | -4.437832218 | 3.73E-20 | protein_coding |
| ENSG00000128482 | RNF112 | -4.020758111 | 0.000884859 | protein_coding |
| ENSG00000169885 | CALML6 | -3.967917634 | 1.47E-05 | protein_coding |
| ENSG00000182853 | VMO1 | -3.933931 | 0.001369576 | protein_coding |
| ENSG00000198520 | ARMH1 | -3.841541751 | 0.002133716 | protein_coding |
| ENSG00000215217 | C5orf49 | -3.841541751 | 0.002133716 | protein_coding |
| ENSG00000179388 | EGR3 | -3.764467024 | 2.58E-12 | protein_coding |
| ENSG00000135625 | EGR4 | -3.742828672 | 0.003346055 | protein_coding |
| ENSG00000242252 | BGLAP | -3.636862034 | 0.005281544 | protein_coding |
| ENSG00000126895 | AVPR2 | -3.522490688 | 0.008390282 | protein_coding |
| ENSG00000172232 | AZU1 | -3.398265654 | 0.013412089 | protein_coding |
| ENSG00000167157 | PRRX2 | -3.338724529 | 0.000739506 | protein_coding |

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| ENSG00000101883 | RHOXF1 | -3.338724529 | 0.000739506 | protein_coding |
| ENSG00000099840 | IZUMO4 | -3.336258471 | 8.34E-08 | protein_coding |
| ENSG00000124249 | KCNK15 | -3.265179506 | 0.001084588 | protein_coding |
| ENSG00000213937 | CLDN9 | -3.262327589 | 0.021566548 | protein_coding |
| ENSG00000148655 | LRMDA | -3.262327589 | 0.021566548 | protein_coding |
| ENSG00000176945 | MUC20 | -3.262327589 | 0.021566548 | protein_coding |
| ENSG00000010379 | SLC6A13 | -3.262327589 | 0.021566548 | protein_coding |
| ENSG00000105427 | CNFN | -3.260066247 | 8.69E-10 | protein_coding |
| ENSG00000121552 | CSTA | -3.213969277 | 0.000214972 | protein_coding |
| ENSG00000068976 | PYGM | -3.213969277 | 0.000214972 | protein_coding |
| ENSG00000130643 | CALY | -3.200161788 | 2.79E-08 | protein_coding |
| ENSG00000111678 | C12orf57 | -3.189774211 | 2.02E-11 | protein_coding |
| ENSG00000182179 | UBA7 | -3.166696499 | 2.30E-08 | protein_coding |
| ENSG00000268041 | AC010616.1 | -3.159768494 | 0.000299755 | protein_coding |
| ENSG00000105479 | CCDC114 | -3.130090117 | 7.20E-06 | protein_coding |
| ENSG00000089101 | CFAP61 | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000105523 | FAM83E | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000261949 | GFY | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000108405 | P2RX1 | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000176358 | TAC4 | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000179930 | ZNF648 | -3.112235529 | 0.034866602 | protein_coding |
| ENSG00000174521 | TTC9B | -3.105786171 | 0.003515158 | protein_coding |
| ENSG00000197921 | HES5 | -3.084823973 | 9.18E-08 | protein_coding |
| ENSG00000176046 | NUPR1 | -3.084010425 | 5.36E-11 | protein_coding |
| ENSG00000278817 | AC007325.4 | -3.000964481 | 3.17E-10 | protein_coding |
| ENSG00000178522 | AMBN | -2.985608339 | 3.61E-08 | protein_coding |
| ENSG00000100033 | PRODH | -2.983760269 | 0.000829981 | protein_coding |
| ENSG00000173991 | TCAP | -2.981856656 | 3.84E-07 | protein_coding |
| ENSG00000125740 | FOSB | -2.972509594 | 4.39E-11 | protein_coding |
| ENSG00000107796 | ACTA2 | -2.965268706 | 0.000252157 | protein_coding |
| ENSG00000198881 | ASB12 | -2.92656981 | 0.007864773 | protein_coding |
| ENSG00000180644 | PRF1 | -2.92656981 | 0.007864773 | protein_coding |
| ENSG00000160188 | RSPH1 | -2.92656981 | 0.007864773 | protein_coding |
| ENSG00000103269 | RHBDL1 | -2.912298415 | 2.57E-10 | protein_coding |
| ENSG00000122877 | EGR2 | -2.848032956 | 5.38E-06 | protein_coding |
| ENSG00000168918 | INPP5D | -2.827856732 | 0.011832427 | protein_coding |
| ENSG00000142538 | PTH2 | -2.827856732 | 0.011832427 | protein_coding |
| ENSG00000131096 | PYY | -2.827856732 | 0.011832427 | protein_coding |
| ENSG00000125508 | SRMS | -2.827856732 | 0.011832427 | protein_coding |
| ENSG00000168350 | DEGS2 | -2.823005296 | 4.60E-05 | protein_coding |
| ENSG00000170345 | FOS | -2.765356114 | 4.88E-10 | protein_coding |
| ENSG00000228727 | SAPCD1 | -2.745149476 | 0.000372105 | protein_coding |
| ENSG00000205090 | TMEM240 | -2.728100079 | 9.35E-05 | protein_coding |

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| ENSG00000197599 | CCDC154 | -2.721890093 | 0.017862218 | protein_coding |
| ENSG00000183615 | FAM167B | -2.721890093 | 0.017862218 | protein_coding |
| ENSG00000128310 | GALR3 | -2.721890093 | 0.017862218 | protein_coding |
| ENSG00000109758 | HGFAC | -2.721890093 | 0.017862218 | protein_coding |
| ENSG00000205323 | SARNP | -2.721890093 | 0.017862218 | protein_coding |
| ENSG00000167617 | CDC42EP5 | -2.709711 | 0.003385132 | protein_coding |
| ENSG00000179085 | DPM3 | -2.70476857 | 1.28E-09 | protein_coding |
| ENSG00000196275 | GTF2IRD2 | -2.703390415 | 0.001197455 | protein_coding |
| ENSG00000126583 | PRKCG | -2.650246531 | 6.52E-06 | protein_coding |
| ENSG00000220201 | ZGLP1 | -2.617005594 | 0.000391938 | protein_coding |
| ENSG00000213977 | TAX1BP3 | -2.611755277 | 5.93E-05 | protein_coding |
| ENSG00000128564 | VGF | -2.603691343 | 0.000883969 | protein_coding |
| ENSG00000181085 | MAPK15 | -2.592090822 | 2.46E-08 | protein_coding |
| ENSG00000137474 | MYO7A | -2.590991293 | 0.000246499 | protein_coding |
| ENSG00000182472 | CAPN12 | -2.583699004 | 0.002275868 | protein_coding |
| ENSG00000198502 | HLA-DRB5 | -2.571062232 | 0.000162828 | protein_coding |
| ENSG00000185633 | NDUFA4L2 | -2.555772014 | 2.01E-05 | protein_coding |
| ENSG00000185291 | IL3RA | -2.55530542 | 9.06E-05 | protein_coding |
| ENSG00000248712 | CCDC153 | -2.553278878 | 0.001184832 | protein_coding |
| ENSG00000239282 | CASTOR1 | -2.550317664 | 0.010033723 | protein_coding |
| ENSG00000147003 | CLTRN | -2.550317664 | 0.010033723 | protein_coding |
| ENSG00000142233 | NTN5 | -2.550317664 | 0.010033723 | protein_coding |
| ENSG00000064787 | BCAS1 | -2.519911068 | 0.003149424 | protein_coding |
| ENSG00000101222 | SPEF1 | -2.505653433 | 0.000258125 | protein_coding |
| ENSG00000146700 | SSC4D | -2.489214068 | 9.78E-05 | protein_coding |
| ENSG00000170209 | ANKK1 | -2.483293713 | 0.041032031 | protein_coding |
| ENSG00000151023 | ENKUR | -2.483293713 | 0.041032031 | protein_coding |
| ENSG00000101188 | NTSR1 | -2.483293713 | 0.041032031 | protein_coding |
| ENSG00000170835 | CEL | -2.478868536 | 0.000519431 | protein_coding |
| ENSG00000008517 | IL32 | -2.463490553 | 0.014485426 | protein_coding |
| ENSG00000133246 | PRAM1 | -2.463490553 | 0.014485426 | protein_coding |
| ENSG00000185615 | PDIA2 | -2.449236765 | 1.98E-07 | protein_coding |
| ENSG00000100359 | SGSM3 | -2.448531967 | 2.72E-06 | protein_coding |
| ENSG00000072182 | ASIC4 | -2.442558694 | 0.00115274 | protein_coding |
| ENSG00000214967 | NPIPA7 | -2.442558694 | 0.00115274 | protein_coding |
| ENSG00000184351 | KRTAP19-1 | -2.43947051 | 0.000668181 | protein_coding |
| ENSG00000229637 | PRAC2 | -2.435313356 | 0.000266845 | protein_coding |
| ENSG00000008128 | CDK11A | -2.431638192 | 4.03E-05 | protein_coding |
| ENSG00000162755 | KLHDC9 | -2.430052228 | 2.44E-05 | protein_coding |
| ENSG00000213199 | ASIC3 | -2.418613875 | 1.55E-07 | protein_coding |
| ENSG00000185522 | LMNTD2 | -2.416072969 | 1.36E-06 | protein_coding |
| ENSG00000163499 | CRYBA2 | -2.390523257 | 0.00288962 | protein_coding |
| ENSG00000244242 | IFITM10 | -2.383194758 | 0.006072876 | protein_coding |

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| ENSG00000136732 | GYPC | -2.374809761 | 1.02E-07 | protein_coding |
| ENSG00000118307 | CASC1 | -2.371101304 | 0.020952111 | protein_coding |
| ENSG00000250506 | CDK3 | -2.371101304 | 0.020952111 | protein_coding |
| ENSG00000213999 | MEF2B | -2.371101304 | 0.020952111 | protein_coding |
| ENSG00000025423 | HSD17B6 | -2.365613353 | 7.51E-07 | protein_coding |
| ENSG00000203896 | LIME1 | -2.362412098 | 2.85E-06 | protein_coding |
| ENSG00000108309 | RUNDC3A | -2.359029249 | 7.11E-05 | protein_coding |
| ENSG00000262484 | CCER2 | -2.353385233 | 9.78E-05 | protein_coding |
| ENSG00000198156 | NPIP6 | -2.34659764 | 0.000336783 | protein_coding |
| ENSG00000117407 | ARTN | -2.337077196 | 3.46E-05 | protein_coding |
| ENSG00000125995 | ROMO1 | -2.332029059 | 8.20E-08 | protein_coding |
| ENSG00000114270 | COL7A1 | -2.330062313 | 2.01E-07 | protein_coding |
| ENSG00000069696 | DRD4 | -2.323320272 | 1.08E-05 | protein_coding |
| ENSG00000256061 | DNAAF4 | -2.309649736 | 0.008458934 | protein_coding |
| ENSG00000255150 | EID3 | -2.309649736 | 0.008458934 | protein_coding |
| ENSG00000130208 | APOC1 | -2.305615738 | 2.25E-07 | protein_coding |
| ENSG00000222009 | BTBD19 | -2.272388225 | 0.030348148 | protein_coding |
| ENSG00000172543 | CTSW | -2.272388225 | 0.030348148 | protein_coding |
| ENSG00000139914 | FITM1 | -2.272388225 | 0.030348148 | protein_coding |
| ENSG00000121905 | HPCA | -2.272388225 | 0.030348148 | protein_coding |
| ENSG00000276600 | RAB7B | -2.272388225 | 0.030348148 | protein_coding |
| ENSG00000204389 | HSPA1A | -2.265459839 | 5.79E-07 | protein_coding |
| ENSG00000234776 | C11orf94 | -2.244078844 | 0.003489554 | protein_coding |
| ENSG00000171703 | TCEA2 | -2.231089452 | 3.35E-07 | protein_coding |
| ENSG00000182196 | ARL6IP4 | -2.219696813 | 0.000159888 | protein_coding |
| ENSG00000241468 | ATP5MF | -2.216325986 | 2.64E-07 | protein_coding |
| ENSG00000142102 | PGGHG | -2.205895487 | 3.99E-07 | protein_coding |
| ENSG00000214212 | C19orf38 | -2.189878061 | 0.004621058 | protein_coding |
| ENSG00000213123 | TCTEX1D2 | -2.177400242 | 0.003128224 | protein_coding |
| ENSG00000089820 | ARHGAP4 | -2.170501849 | 1.38E-05 | protein_coding |
| ENSG00000105219 | CNTD2 | -2.166421587 | 0.043991311 | protein_coding |
| ENSG00000154545 | MAGED4 | -2.166421587 | 0.043991311 | protein_coding |
| ENSG00000148826 | NKX6-2 | -2.166421587 | 0.043991311 | protein_coding |
| ENSG00000213658 | LAT | -2.1502564 | 0.016492881 | protein_coding |
| ENSG00000153902 | LGI4 | -2.1502564 | 0.016492881 | protein_coding |
| ENSG00000184678 | HIST2H2BE | -2.1475694 | 5.01E-06 | protein_coding |
| ENSG00000052344 | PRSS8 | -2.140304631 | 0.009732694 | protein_coding |
| ENSG00000105672 | ETV2 | -2.138834945 | 0.000236256 | protein_coding |
| ENSG00000142765 | SYTL1 | -2.131308576 | 1.80E-05 | protein_coding |
| ENSG00000205593 | DENND6B | -2.130583264 | 8.17E-06 | protein_coding |
| ENSG00000184163 | C1QTNF12 | -2.125586431 | 8.17E-05 | protein_coding |
| ENSG00000188573 | FBLL1 | -2.121303817 | 5.71E-05 | protein_coding |
| ENSG00000187848 | P2RX2 | -2.111123709 | 0.000176356 | protein_coding |

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| ENSG00000221821 | C6orf226 | -2.109805748 | 0.000135269 | protein_coding |
| ENSG00000160539 | PLPP7 | -2.106188001 | 4.56E-05 | protein_coding |
| ENSG00000127415 | IDUA | -2.10166063 | 7.18E-06 | protein_coding |
| ENSG00000104899 | AMH | -2.100895125 | 1.17E-06 | protein_coding |
| ENSG00000266714 | MYO15B | -2.095723623 | 1.11E-05 | protein_coding |
| ENSG00000150281 | CTF1 | -2.090976439 | 0.000156638 | protein_coding |
| ENSG00000183054 | RGPD6 | -2.080776579 | 0.00360343 | protein_coding |
| ENSG00000138100 | TRIM54 | -2.078277573 | 0.005290723 | protein_coding |
| ENSG00000101213 | PTK6 | -2.066901712 | 0.000284711 | protein_coding |
| ENSG00000130203 | APOE | -2.064591187 | 1.25E-05 | protein_coding |
| ENSG00000188596 | CFAP54 | -2.063429289 | 0.032292239 | protein_coding |
| ENSG00000198223 | CSF2RA | -2.063429289 | 0.032292239 | protein_coding |
| ENSG00000205560 | CPT1B | -2.059590851 | 0.000498242 | protein_coding |
| ENSG00000187479 | C11orf96 | -2.057365248 | 3.49E-05 | protein_coding |
| ENSG00000100429 | HDAC10 | -2.057365248 | 3.49E-05 | protein_coding |
| ENSG00000119632 | IFI27L2 | -2.052632112 | 1.37E-05 | protein_coding |
| ENSG00000130707 | ASS1 | -2.048518379 | 1.93E-06 | protein_coding |
| ENSG00000205155 | PSENEN | -2.044559931 | 7.15E-06 | protein_coding |
| ENSG00000100031 | GGT1 | -2.038489626 | 5.95E-05 | protein_coding |
| ENSG00000260428 | SCX | -2.035147809 | 0.004613369 | protein_coding |
| ENSG00000184838 | PRR16 | -2.026039549 | 0.006891763 | protein_coding |
| ENSG00000137101 | CD72 | -2.025391811 | 0.000931128 | protein_coding |
| ENSG00000221916 | C19orf73 | -2.025122134 | 0.000334323 | protein_coding |
| ENSG00000215440 | NPEPL1 | -2.024663972 | 1.95E-05 | protein_coding |
| ENSG00000142530 | FAM71E1 | -2.021347741 | 2.78E-05 | protein_coding |
| ENSG00000103145 | HCFC1R1 | -2.01753908 | 4.90E-06 | protein_coding |
| ENSG00000159588 | CCDC17 | -2.013869835 | 0.010811714 | protein_coding |
| ENSG00000127588 | GNG13 | -2.013622696 | 3.61E-05 | protein_coding |
| ENSG00000127578 | WFIKKN1 | -2.002796114 | 0.000392948 | protein_coding |
| ENSG00000135502 | SLC26A10 | -2.001477623 | 7.03E-05 | protein_coding |
| ENSG00000140675 | SLC5A2 | -2.000546585 | 0.004060649 | protein_coding |
| ENSG00000012171 | SEMA3B | -1.994819138 | 2.48E-05 | protein_coding |
| ENSG00000205143 | ARID3C | -1.988028651 | 0.005911861 | protein_coding |
| ENSG00000176973 | FAM89B | -1.987805988 | 3.19E-05 | protein_coding |
| ENSG00000177106 | EPS8L2 | -1.983445534 | 0.000189057 | protein_coding |
| ENSG00000007952 | NOX1 | -1.980119157 | 0.000462155 | protein_coding |
| ENSG00000135441 | BLOC1S1 | -1.976320667 | 1.84E-05 | protein_coding |
| ENSG00000257704 | INAFM1 | -1.972842091 | 1.73E-05 | protein_coding |
| ENSG00000232388 | SMIM26 | -1.972335978 | 6.52E-06 | protein_coding |
| ENSG00000184697 | CLDN6 | -1.971838766 | 0.00898543 | protein_coding |
| ENSG00000244731 | C4A | -1.97104004 | 0.045202178 | protein_coding |
| ENSG00000089199 | CHGB | -1.97104004 | 0.045202178 | protein_coding |
| ENSG00000130427 | EPO | -1.97104004 | 0.045202178 | protein_coding |

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| ENSG00000163497 | FEV | -1.97104004 | 0.045202178 | protein_coding |
| ENSG00000182687 | GALR2 | -1.97104004 | 0.045202178 | protein_coding |
| ENSG00000243708 | PLA2G4B | -1.97104004 | 0.045202178 | protein_coding |
| ENSG00000176978 | DPP7 | -1.959427296 | 1.08E-05 | protein_coding |
| ENSG00000143369 | ECM1 | -1.95763255 | 0.00512978 | protein_coding |
| ENSG00000165695 | AK8 | -1.957080052 | 0.000543898 | protein_coding |
| ENSG00000089692 | LAG3 | -1.950081899 | 0.014380224 | protein_coding |
| ENSG00000206140 | TMEM191C | -1.948458168 | 0.0032271 | protein_coding |
| ENSG00000129673 | AANAT | -1.939318447 | 0.007582043 | protein_coding |
| ENSG00000164405 | UQCRQ | -1.934688244 | 5.68E-06 | protein_coding |
| ENSG00000197568 | HHLA3 | -1.927271129 | 1.88E-05 | protein_coding |
| ENSG00000182685 | BRICD5 | -1.920286768 | 0.000158397 | protein_coding |
| ENSG00000197530 | MIB2 | -1.907208648 | 9.19E-06 | protein_coding |
| ENSG00000182809 | CRIP2 | -1.892734611 | 9.90E-05 | protein_coding |
| ENSG00000100604 | CHGA | -1.892262009 | 0.00561466 | protein_coding |
| ENSG00000074660 | SCARF1 | -1.892262009 | 0.00561466 | protein_coding |
| ENSG00000100097 | LGALS1 | -1.890924613 | 0.000412542 | protein_coding |
| ENSG00000135409 | AMHR2 | -1.888905982 | 0.009730816 | protein_coding |
| ENSG00000188243 | COMMD6 | -1.8887785 | 1.21E-05 | protein_coding |
| ENSG00000105699 | LSR | -1.887594566 | 1.31E-05 | protein_coding |
| ENSG00000165349 | SLC7A3 | -1.884028644 | 2.80E-05 | protein_coding |
| ENSG00000170458 | CD14 | -1.88334262 | 0.019137366 | protein_coding |
| ENSG00000188672 | RHCE | -1.88334262 | 0.019137366 | protein_coding |
| ENSG00000158815 | FGF17 | -1.880802338 | 0.000552409 | protein_coding |
| ENSG00000125611 | CHCHD5 | -1.880230021 | 1.95E-05 | protein_coding |
| ENSG00000184381 | PLA2G6 | -1.873834913 | 2.44E-05 | protein_coding |
| ENSG00000169020 | ATP5ME | -1.870229522 | 1.63E-05 | protein_coding |
| ENSG00000152082 | MZT2B | -1.8669941 | 1.25E-05 | protein_coding |
| ENSG00000240583 | AQP1 | -1.859842361 | 0.002617946 | protein_coding |
| ENSG00000100399 | CHADL | -1.856917147 | 0.015305394 | protein_coding |
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| ENSG00000134825 | TMEM258 | -1.856210634 | 1.41E-05 | protein_coding |
| ENSG00000239779 | WBP1 | -1.853602288 | 3.88E-05 | protein_coding |
| ENSG00000126759 | CFP | -1.850587697 | 0.00701327 | protein_coding |
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| ENSG00000215788 | TNFRSF25 | -1.844799823 | 0.000131231 | protein_coding |
| ENSG00000173762 | CD7 | -1.837389242 | 0.033376343 | protein_coding |
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| ENSG00000261408 | TEN1-CDK3 | -1.836144045 | 0.002183911 | protein_coding |
| ENSG00000183617 | MRPL54 | -1.83572062 | 1.87E-05 | protein_coding |
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| ENSG00000078018 | MAP2 | -1.813365589 | 0.025475297 | protein_coding |
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| ENSG00000149575 | SCN2B | -1.813365589 | 0.025475297 | protein_coding |
| ENSG00000105404 | RABAC1 | -1.812559449 | 4.33E-05 | protein_coding |
| ENSG00000182326 | C1S | -1.811740233 | 0.000679363 | protein_coding |
| ENSG00000254995 | STX16- NPEPL1 | -1.810539058 | 0.0014637 | protein_coding |
| ENSG00000233198 | RNF224 | -1.807673662 | 0.008764824 | protein_coding |
| ENSG00000140400 | MAN2C1 | -1.798478435 | 2.46E-05 | protein_coding |
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| ENSG00000088881 | EBF4 | -1.461864963 | 0.000733422 | protein_coding |
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| ENSG00000196376 | SLC35F1 | 1.072803587 | 0.012158262 | protein_coding |

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| ENSG00000145087 | STXBP5L | 1.072920237 | 0.029208486 | protein_coding |
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| ENSG00000205213 | LGR4 | 1.12108462 | 0.007712337 | protein_coding |
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| ENSG00000110321 | EIF4G2 | 1.121965092 | 0.006933677 | protein_coding |
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| ENSG00000112293 | GPLD1 | 1.161816344 | 0.022901013 | protein_coding |
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| ENSG00000105778 | AVL9 | 1.16272964 | 0.005964546 | protein_coding |
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| ENSG00000153993 | SEMA3D | 1.164855193 | 0.010938752 | protein_coding |
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| ENSG00000119684 | MLH3 | 1.170522416 | 0.03592403 | protein_coding |
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| ENSG00000084710 | EFR3B | 1.171150426 | 0.008276617 | protein_coding |
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| ENSG00000143869 | GDF7 | 1.172218601 | 0.007022374 | protein_coding |
| ENSG00000103995 | CEP152 | 1.172276948 | 0.007173549 | protein_coding |
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| ENSG00000134318 | ROCK2 | 1.311880345 | 0.001909946 | protein_coding |
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| ENSG00000118058 | KMT2A | 1.314377573 | 0.001744004 | protein_coding |
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| ENSG00000104067 | TJP1 | 1.314800684 | 0.001940283 | protein_coding |
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| ENSG00000140396 | NCOA2 | 1.316768288 | 0.001974792 | protein_coding |
| ENSG00000129422 | MTUS1 | 1.317931617 | 0.002524632 | protein_coding |
| ENSG00000060749 | QSER1 | 1.31797037 | 0.001759877 | protein_coding |
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| ENSG00000182866 | LCK | 1.321281194 | 0.030695741 | protein_coding |
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| ENSG00000124251 | TP53TG5 | 1.322356415 | 0.046163285 | protein_coding |
| ENSG00000101746 | NOL4 | 1.322791584 | 0.00868018 | protein_coding |
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| ENSG00000204217 | BMPR2 | 1.32406381 | 0.001861793 | protein_coding |
| ENSG00000134250 | NOTCH2 | 1.326804877 | 0.001536936 | protein_coding |
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| ENSG00000198597 | ZNF536 | 1.327031184 | 0.003259596 | protein_coding |
| ENSG00000164151 | ICE1 | 1.32933756 | 0.001627379 | protein_coding |
| ENSG00000095564 | BTAFL | 1.329934127 | 0.001557033 | protein_coding |
| ENSG00000143479 | DYRK3 | 1.330727411 | 0.002318466 | protein_coding |
| ENSG00000116132 | PRRX1 | 1.330997078 | 0.010994238 | protein_coding |
| ENSG00000165997 | ARL5B | 1.331650203 | 0.001589295 | protein_coding |
| ENSG00000128000 | ZNF780B | 1.333586029 | 0.00489751 | protein_coding |
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| ENSG00000138593 | SECISBP2L | 1.338702357 | 0.002257411 | protein_coding |
| ENSG00000129167 | TPH1 | 1.339444877 | 0.040993521 | protein_coding |

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| ENSG00000146859 | TMEM140 | 1.33996799 | 0.002333097 | protein_coding |
| ENSG00000139220 | PPFIA2 | 1.34047278 | 0.025675336 | protein_coding |
| ENSG00000143322 | ABL2 | 1.343899557 | 0.001468436 | protein_coding |
| ENSG00000111961 | SASH1 | 1.344340781 | 0.001696407 | protein_coding |
| ENSG00000153827 | TRIP12 | 1.345138649 | 0.001339954 | protein_coding |
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| ENSG00000065534 | MYLK | 1.348900802 | 0.002712831 | protein_coding |
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| ENSG00000137968 | SLC44A5 | 1.369008817 | 0.00200933 | protein_coding |
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| ENSG00000172869 | DMXL1 | 1.438794507 | 0.000827875 | protein_coding |
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| ENSG00000134709 | HOOK1 | 1.445799753 | 0.000669691 | protein_coding |
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| ENSG00000184384 | MAML2 | 1.483301032 | 0.002967311 | protein_coding |
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| ENSG00000171488 | LRRC8C | 1.495655204 | 0.000592921 | protein_coding |
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| ENSG00000138246 | DNAJC13 | 1.530608447 | 0.000328102 | protein_coding |
| ENSG00000005100 | DHX33 | 1.531905824 | 0.000284731 | protein_coding |
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| ENSG00000198932 | GPRASP1 | 1.537388931 | 0.044489089 | protein_coding |

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| ENSG00000160352 | ZNF714 | 1.539256826 | 0.000339808 | protein_coding |
| ENSG00000143858 | SYT2 | 1.540152201 | 0.000828899 | protein_coding |
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| ENSG00000146072 | TNFRSF21 | 1.544876866 | 0.000366539 | protein_coding |
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| ENSG00000165288 | BRWD3 | 1.548170364 | 0.000313688 | protein_coding |
| ENSG00000162601 | MYSM1 | 1.548840839 | 0.000258015 | protein_coding |
| ENSG00000102780 | DGKH | 1.548868142 | 0.00034466 | protein_coding |
| ENSG00000006459 | KDM7A | 1.55092682 | 0.000308933 | protein_coding |
| ENSG00000117322 | CR2 | 1.551790528 | 0.003276705 | protein_coding |
| ENSG00000118412 | CASP8AP2 | 1.554386168 | 0.000291275 | protein_coding |
| ENSG00000171988 | JMJD1C | 1.555443752 | 0.000335561 | protein_coding |
| ENSG00000137962 | ARHGAP29 | 1.55562013 | 0.000323269 | protein_coding |
| ENSG00000125107 | CNOT1 | 1.556291359 | 0.000215487 | protein_coding |
| ENSG00000170500 | LONRF2 | 1.556880596 | 0.000387151 | protein_coding |
| ENSG00000174485 | DENND4A | 1.558440987 | 0.000332434 | protein_coding |
| ENSG00000151693 | ASAP2 | 1.559963117 | 0.000464187 | protein_coding |
| ENSG00000066933 | MYO9A | 1.56010281 | 0.000276046 | protein_coding |
| ENSG00000115020 | PIKFYVE | 1.561117654 | 0.000264946 | protein_coding |
| ENSG00000163590 | PPM1L | 1.564347096 | 0.000287948 | protein_coding |
| ENSG00000104164 | BLOC1S6 | 1.566470141 | 0.000267991 | protein_coding |
| ENSG00000169860 | P2RY1 | 1.567154164 | 0.000301637 | protein_coding |
| ENSG00000123612 | ACVR1C | 1.568105443 | 0.017143019 | protein_coding |
| ENSG00000101265 | RASSF2 | 1.568429952 | 0.000697959 | protein_coding |
| ENSG00000284906 | AC091057.6 | 1.571692592 | 0.00313105 | protein_coding |
| ENSG00000176563 | CNTD1 | 1.57677882 | 0.021096335 | protein_coding |
| ENSG00000113594 | LIFR | 1.577345315 | 0.000247113 | protein_coding |
| ENSG00000147041 | SYTL5 | 1.577822614 | 0.000683479 | protein_coding |
| ENSG00000197077 | KIAA1671 | 1.578114965 | 0.000215822 | protein_coding |
| ENSG00000133657 | ATP13A3 | 1.582815864 | 0.000187501 | protein_coding |
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| ENSG00000180875 | GREM2 | 1.587515822 | 0.026497687 | protein_coding |
| ENSG00000111859 | NEDD9 | 1.587515822 | 0.026497687 | protein_coding |
| ENSG00000119778 | ATAD2B | 1.588011266 | 0.00026291 | protein_coding |
| ENSG00000075213 | SEMA3A | 1.589108885 | 0.001514254 | protein_coding |
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| ENSG00000140993 | TIGD7 | 1.591146216 | 0.004127818 | protein_coding |
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| ENSG00000136014 | USP44 | 1.593146999 | 0.000860906 | protein_coding |
| ENSG00000081026 | MAGI3 | 1.59508587 | 0.000203674 | protein_coding |
| ENSG00000073910 | FRY | 1.595196709 | 0.000882878 | protein_coding |
| ENSG00000135837 | CEP350 | 1.595561605 | 0.000184324 | protein_coding |
| ENSG00000100605 | ITPK1 | 1.600208148 | 0.000175365 | protein_coding |
| ENSG00000069667 | RORA | 1.60084916 | 0.000376629 | protein_coding |
| ENSG00000166736 | HTR3A | 1.60115282 | 0.034088382 | protein_coding |
| ENSG00000070018 | LRP6 | 1.601160991 | 0.00018209 | protein_coding |
| ENSG00000172348 | RCAN2 | 1.601756527 | 0.002312478 | protein_coding |
| ENSG00000065413 | ANKRD44 | 1.601847735 | 0.000956767 | protein_coding |
| ENSG00000116675 | DNAJC6 | 1.601951112 | 0.000200597 | protein_coding |
| ENSG00000157077 | ZFYVE9 | 1.610490067 | 0.000199798 | protein_coding |
| ENSG00000128585 | MKLN1 | 1.613564807 | 0.000175186 | protein_coding |
| ENSG00000183808 | RBM12B | 1.614344008 | 0.000175273 | protein_coding |
| ENSG00000100490 | CDKL1 | 1.617973875 | 0.001303686 | protein_coding |
| ENSG00000115423 | DNAH6 | 1.61835016 | 0.010511842 | protein_coding |
| ENSG00000140873 | ADAMTS18 | 1.619049114 | 0.045117465 | protein_coding |
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| ENSG00000260097 | SPDYE6 | 1.622120824 | 0.006984897 | protein_coding |
| ENSG00000054654 | SYNE2 | 1.622148252 | 0.000150131 | protein_coding |
| ENSG00000206538 | VGLL3 | 1.623341956 | 0.000846283 | protein_coding |
| ENSG00000011405 | PIK3C2A | 1.624680205 | 0.00013574 | protein_coding |
| ENSG00000176542 | USF3 | 1.628449648 | 0.000186887 | protein_coding |
| ENSG00000103489 | XYLT1 | 1.630072381 | 0.000257275 | protein_coding |
| ENSG00000088305 | DNMT3B | 1.632640001 | 0.000138126 | protein_coding |
| ENSG00000109756 | RAPGEF2 | 1.636713555 | 0.000143959 | protein_coding |
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| ENSG00000109265 | KIAA1211 | 1.638705317 | 0.000242381 | protein_coding |
| ENSG00000160145 | KALRN | 1.639049613 | 0.000711031 | protein_coding |
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| ENSG00000162989 | KCNJ3 | 1.640836162 | 0.009270117 | protein_coding |
| ENSG00000066405 | CLDN18 | 1.641699242 | 0.020623756 | protein_coding |
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| ENSG00000152402 | GUCY1A2 | 1.643077755 | 0.000881171 | protein_coding |
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| ENSG00000137642 | SORL1 | 1.64978141 | 0.000184284 | protein_coding |
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| ENSG00000136237 | RAPGEF5 | 1.651115671 | 0.00025224 | protein_coding |
| ENSG00000164330 | EBF1 | 1.651418749 | 0.008734897 | protein_coding |
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| ENSG00000113742 | CPEB4 | 1.651542118 | 0.000179574 | protein_coding |
| ENSG00000117500 | TMED5 | 1.654776731 | 9.78E-05 | protein_coding |
| ENSG00000188152 | NUTM2G | 1.65575335 | 0.004091611 | protein_coding |
| ENSG00000072736 | NFATC3 | 1.655792559 | 0.000128208 | protein_coding |
| ENSG00000242689 | CNTF | 1.659152604 | 0.006686163 | protein_coding |
| ENSG00000152818 | UTRN | 1.659693577 | 0.000106424 | protein_coding |
| ENSG00000169314 | C22orf15 | 1.662217371 | 0.026105331 | protein_coding |
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| ENSG00000186469 | GNG2 | 1.664419208 | 0.000639909 | protein_coding |
| ENSG00000116127 | ALMS1 | 1.674599051 | 0.000105951 | protein_coding |
| ENSG00000142396 | ERVK3-1 | 1.67649588 | 0.000334703 | protein_coding |
| ENSG00000124942 | AHNAK | 1.677722972 | 8.13E-05 | protein_coding |
| ENSG00000065060 | UHRF1BP1 | 1.680383083 | 8.62E-05 | protein_coding |
| ENSG00000157404 | KIT | 1.681794336 | 0.000119576 | protein_coding |
| ENSG00000120800 | UTP20 | 1.681877796 | 7.82E-05 | protein_coding |
| ENSG00000048052 | HDAC9 | 1.682145192 | 0.002565378 | protein_coding |
| ENSG00000162885 | B3GALNT2 | 1.683633572 | 0.000106381 | protein_coding |
| ENSG00000205238 | SPDYE2 | 1.683746314 | 0.007259967 | protein_coding |
| ENSG00000196912 | ANKRD36B | 1.685253921 | 0.000443499 | protein_coding |
| ENSG00000164171 | ITGA2 | 1.688662886 | 0.000199232 | protein_coding |
| ENSG00000173567 | ADGRF3 | 1.688997205 | 0.033910222 | protein_coding |
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| ENSG00000152377 | SPOCK1 | 1.69689086 | 0.008764824 | protein_coding |
| ENSG00000112159 | MDN1 | 1.698847211 | 5.99E-05 | protein_coding |
| ENSG00000184588 | PDE4B | 1.698877121 | 0.008356463 | protein_coding |
| ENSG00000150893 | FREM2 | 1.703059914 | 0.000135322 | protein_coding |
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| ENSG00000172733 | PURG | 1.704867089 | 0.000826852 | protein_coding |
| ENSG00000140836 | ZFHX3 | 1.706499866 | 0.00011899 | protein_coding |
| ENSG00000145675 | PIK3R1 | 1.708158629 | 0.000101321 | protein_coding |
| ENSG00000066279 | ASPM | 1.714529846 | 5.26E-05 | protein_coding |
| ENSG00000108021 | FAM208B | 1.7165249 | 5.10E-05 | protein_coding |
| ENSG00000158427 | TMSB15B | 1.718197502 | 0.010384446 | protein_coding |
| ENSG00000137393 | RNF144B | 1.721995339 | 0.001490418 | protein_coding |

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| ENSG00000150627 | WDR17 | 1.722449857 | 0.000119358 | protein_coding |
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| ENSG00000136040 | PLXNC1 | 1.728552161 | 0.001127459 | protein_coding |
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| ENSG00000162849 | KIF26B | 1.734513932 | 0.000286059 | protein_coding |
| ENSG00000164187 | LMBRD2 | 1.736457661 | 0.00010159 | protein_coding |
| ENSG00000197969 | VPS13A | 1.737418406 | 4.57E-05 | protein_coding |
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| ENSG00000156675 | RAB11FIP1 | 1.744321703 | 5.44E-05 | protein_coding |
| ENSG00000141367 | CLTC | 1.745486264 | 3.70E-05 | protein_coding |
| ENSG00000187801 | ZFP69B | 1.747700817 | 0.001240795 | protein_coding |
| ENSG00000166446 | CDYL2 | 1.750101932 | 0.000159047 | protein_coding |
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| ENSG00000138688 | KIAA1109 | 1.755052342 | 5.93E-05 | protein_coding |
| ENSG00000136197 | C7orf25 | 1.755710159 | 0.025475297 | protein_coding |
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| ENSG00000121101 | TEX14 | 1.755710159 | 0.025475297 | protein_coding |
| ENSG00000180530 | NRIP1 | 1.756846255 | 6.88E-05 | protein_coding |
| ENSG00000038295 | TLL1 | 1.762415722 | 0.008204261 | protein_coding |
| ENSG00000081479 | LRP2 | 1.762987354 | 5.20E-05 | protein_coding |
| ENSG00000110344 | UBE4A | 1.777797759 | 3.83E-05 | protein_coding |
| ENSG00000130783 | CCDC62 | 1.777899623 | 0.045202178 | protein_coding |
| ENSG00000176928 | GCNT4 | 1.777899623 | 0.045202178 | protein_coding |
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| ENSG00000188064 | WNT7B | 1.777899623 | 0.045202178 | protein_coding |
| ENSG00000145794 | MEGF10 | 1.785809915 | 0.00374952 | protein_coding |
| ENSG00000198780 | FAM169A | 1.789625708 | 6.15E-05 | protein_coding |
| ENSG00000261150 | EPPK1 | 1.791082152 | 0.000306115 | protein_coding |
| ENSG00000119547 | ONECUT2 | 1.792830264 | 3.25E-05 | protein_coding |
| ENSG00000168769 | TET2 | 1.796930299 | 4.59E-05 | protein_coding |
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| ENSG00000057468 | MSH4 | 1.802890026 | 0.033376343 | protein_coding |
| ENSG00000119121 | TRPM6 | 1.802890026 | 0.033376343 | protein_coding |
| ENSG00000064309 | CDON | 1.803896811 | 3.54E-05 | protein_coding |
| ENSG00000156011 | PSD3 | 1.803928892 | 3.40E-05 | protein_coding |
| ENSG00000074410 | CA12 | 1.813447702 | 4.82E-05 | protein_coding |
| ENSG00000162490 | DRAXIN | 1.819474048 | 0.019137366 | protein_coding |
| ENSG00000103534 | TMC5 | 1.819474048 | 0.019137366 | protein_coding |
| ENSG00000230453 | ANKRD18B | 1.820314568 | 9.13E-05 | protein_coding |
| ENSG00000134532 | SOX5 | 1.821627016 | 0.000256125 | protein_coding |

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| ENSG00000123104 | ITPR2 | 1.826962631 | 2.84E-05 | protein_coding |
| ENSG00000138119 | MYOF | 1.829736683 | 0.003870034 | protein_coding |
| ENSG00000113810 | SMC4 | 1.830974398 | 1.66E-05 | protein_coding |
| ENSG00000156218 | ADAMTSL3 | 1.835336115 | 0.003476403 | protein_coding |
| ENSG00000177483 | RBM44 | 1.8401208 | 0.007582043 | protein_coding |
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| ENSG00000139209 | SLC38A4 | 1.84698292 | 0.00512978 | protein_coding |
| ENSG00000140937 | CDH11 | 1.847887059 | 0.001614421 | protein_coding |
| ENSG00000176244 | ACBD7 | 1.852558997 | 0.000433815 | protein_coding |
| ENSG00000107249 | GLIS3 | 1.864339988 | 0.000511591 | protein_coding |
| ENSG00000253729 | PRKDC | 1.865211579 | 1.09E-05 | protein_coding |
| ENSG00000119285 | HEATR1 | 1.865747931 | 1.14E-05 | protein_coding |
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| ENSG00000284862 | CCDC39 | 1.870238424 | 0.032292239 | protein_coding |
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| ENSG00000182400 | TRAPPC6B | 1.873204296 | 0.000121634 | protein_coding |
| ENSG00000151835 | SACS | 1.875909836 | 1.19E-05 | protein_coding |
| ENSG00000188158 | NHS | 1.876694399 | 8.97E-05 | protein_coding |
| ENSG00000005810 | MYCBP2 | 1.8770259 | 1.05E-05 | protein_coding |
| ENSG00000113522 | RAD50 | 1.877836135 | 0.000147997 | protein_coding |
| ENSG00000119737 | GPR75 | 1.879289672 | 0.000524355 | protein_coding |
| ENSG00000145826 | LECT2 | 1.880538599 | 0.014380224 | protein_coding |
| ENSG00000127329 | PTPRB | 1.883505264 | 0.00898543 | protein_coding |
| ENSG00000171724 | VAT1L | 1.883505264 | 0.00898543 | protein_coding |
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| ENSG00000103888 | CEMIP | 1.89096877 | 0.002641227 | protein_coding |
| ENSG00000165323 | FAT3 | 1.903268712 | 1.92E-05 | protein_coding |
| ENSG00000177200 | CHD9 | 1.905022104 | 1.17E-05 | protein_coding |
| ENSG00000173166 | RAPH1 | 1.909250224 | 0.000174393 | protein_coding |
| ENSG00000145242 | EPHA5 | 1.911578956 | 0.000351831 | protein_coding |
| ENSG00000182901 | RGS7 | 1.924382764 | 0.002322339 | protein_coding |
| ENSG00000143341 | HMCN1 | 1.930744995 | 0.000481604 | protein_coding |
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| ENSG00000242265 | PEG10 | 1.946351172 | 0.018003167 | protein_coding |
| ENSG00000097096 | SYDE2 | 1.948220768 | 1.81E-05 | protein_coding |
| ENSG00000198963 | RORB | 1.952670797 | 7.86E-05 | protein_coding |
| ENSG00000165813 | CCDC186 | 1.959398793 | 1.18E-05 | protein_coding |
| ENSG00000198729 | PPP1R14C | 1.962666637 | 9.20E-06 | protein_coding |
| ENSG00000156869 | FRRS1 | 1.96556378 | 6.07E-05 | protein_coding |
| ENSG00000146858 | ZC3HAV1L | 1.966993866 | 9.73E-06 | protein_coding |
| ENSG00000241484 | ARHGAP8 | 1.968682577 | 6.30E-05 | protein_coding |

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| ENSG00000000005 | TNMD | 1.972858635 | 0.00360343 | protein_coding |
| ENSG00000001626 | CFTR | 1.974359603 | 0.043991311 | protein_coding |
| ENSG00000073464 | CLCN4 | 1.974359603 | 0.043991311 | protein_coding |
| ENSG00000206384 | COL6A6 | 1.974359603 | 0.043991311 | protein_coding |
| ENSG00000173258 | ZNF483 | 1.987027818 | 0.000189959 | protein_coding |
| ENSG00000160401 | CFAP157 | 1.997639638 | 0.000150461 | protein_coding |
| ENSG00000177076 | ACER2 | 2.006147899 | 0.001496038 | protein_coding |
| ENSG00000196159 | FAT4 | 2.013227867 | 1.48E-05 | protein_coding |
| ENSG00000133863 | TEX15 | 2.014496886 | 4.10E-06 | protein_coding |
| ENSG00000185477 | GPRIN3 | 2.016214427 | 5.15E-06 | protein_coding |
| ENSG00000131016 | AKAP12 | 2.019819803 | 2.52E-06 | protein_coding |
| ENSG00000188848 | BEND4 | 2.021710131 | 5.70E-06 | protein_coding |
| ENSG00000255423 | EBLN2 | 2.023913006 | 0.000977512 | protein_coding |
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| ENSG00000112379 | ARFGEF3 | 2.066732585 | 5.54E-06 | protein_coding |
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| ENSG00000134317 | GRHL1 | 2.076376212 | 2.92E-05 | protein_coding |
| ENSG00000099260 | PALMD | 2.076828015 | 0.009732694 | protein_coding |
| ENSG00000163377 | FAM19A4 | 2.080259875 | 0.030348148 | protein_coding |
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| ENSG00000004799 | PDK4 | 2.101826493 | 0.004621058 | protein_coding |
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| ENSG00000165194 | PCDH19 | 2.110641212 | 1.02E-05 | protein_coding |
| ENSG00000166126 | AMN | 2.116339181 | 0.016492881 | protein_coding |
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| ENSG00000138769 | CDKL2 | 2.130372933 | 0.000890608 | protein_coding |
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| ENSG00000172292 | CERS6 | 2.138760603 | 1.19E-06 | protein_coding |
| ENSG00000180801 | ARSJ | 2.14666337 | 6.76E-05 | protein_coding |
| ENSG00000267216 | AC020915.1 | 2.176045253 | 0.00064876 | protein_coding |
| ENSG00000234284 | ZNF879 | 2.178477119 | 0.00013211 | protein_coding |
| ENSG00000148204 | CRB2 | 2.178915363 | 0.020952111 | protein_coding |
| ENSG00000028137 | TNFRSF1B | 2.178915363 | 0.020952111 | protein_coding |
| ENSG00000133124 | IRS4 | 2.18959203 | 3.34E-07 | protein_coding |
| ENSG00000106278 | PTPRZ1 | 2.189852236 | 0.011803031 | protein_coding |
| ENSG00000111913 | RIPOR2 | 2.189852236 | 0.011803031 | protein_coding |
| ENSG00000115464 | USP34 | 2.190390421 | 4.43E-07 | protein_coding |
| ENSG00000115232 | ITGA4 | 2.190633679 | 1.41E-06 | protein_coding |
| ENSG00000112137 | PHACTR1 | 2.193012989 | 0.000204205 | protein_coding |

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| ENSG00000120500 | ARR3 | 2.196477074 | 0.005286278 | protein_coding |
| ENSG00000169856 | ONECUT1 | 2.196477074 | 0.005286278 | protein_coding |
| ENSG00000169403 | PTAFR | 2.196477074 | 0.005286278 | protein_coding |
| ENSG00000159905 | ZNF221 | 2.204106808 | 0.001436097 | protein_coding |
| ENSG00000046889 | PREX2 | 2.215859245 | 2.61E-06 | protein_coding |
| ENSG00000151012 | SLC7A11 | 2.218139691 | 4.49E-07 | protein_coding |
| ENSG00000173678 | SPDYE2B | 2.248026154 | 0.001998931 | protein_coding |
| ENSG00000189195 | BTBD8 | 2.266310999 | 0.000273264 | protein_coding |
| ENSG00000023445 | BIRC3 | 2.271254164 | 0.014485426 | protein_coding |
| ENSG00000186047 | DLEU7 | 2.271254164 | 0.014485426 | protein_coding |
| ENSG00000179331 | RAB39A | 2.283506676 | 3.36E-06 | protein_coding |
| ENSG00000132561 | MATN2 | 2.283990175 | 0.000860935 | protein_coding |
| ENSG00000164142 | FAM160A1 | 2.285009301 | 3.62E-06 | protein_coding |
| ENSG00000165376 | CLDN2 | 2.293253063 | 0.041032031 | protein_coding |
| ENSG00000255154 | HTD2 | 2.293253063 | 0.041032031 | protein_coding |
| ENSG00000142512 | SIGLEC10 | 2.293253063 | 0.041032031 | protein_coding |
| ENSG00000110436 | SLC1A2 | 2.293253063 | 0.041032031 | protein_coding |
| ENSG00000183638 | RP1L1 | 2.293642619 | 0.001516645 | protein_coding |
| ENSG00000197837 | HIST4H4 | 2.306958564 | 0.00288962 | protein_coding |
| ENSG00000188167 | TMPPE | 2.318718056 | 2.18E-05 | protein_coding |
| ENSG00000197779 | ZNF81 | 2.324104073 | 5.78E-07 | protein_coding |
| ENSG00000152580 | IGSF10 | 2.326513282 | 0.006072876 | protein_coding |
| ENSG00000092969 | TGFB2 | 2.326513282 | 0.006072876 | protein_coding |
| ENSG00000139973 | SYT16 | 2.34502156 | 2.80E-05 | protein_coding |
| ENSG00000146414 | SHPRH | 2.35299151 | 1.08E-07 | protein_coding |
| ENSG00000179902 | C1orf194 | 2.358036719 | 0.010033723 | protein_coding |
| ENSG00000131730 | CKMT2 | 2.359681431 | 0.000519431 | protein_coding |
| ENSG00000188033 | ZNF490 | 2.359681431 | 0.000519431 | protein_coding |
| ENSG00000144893 | MED12L | 2.374339114 | 7.67E-07 | protein_coding |
| ENSG00000233757 | AC092835.1 | 2.396088153 | 0.000404469 | protein_coding |
| ENSG00000149970 | CNKS2 | 2.417386885 | 0.02704271 | protein_coding |
| ENSG00000204882 | GPR20 | 2.417386885 | 0.02704271 | protein_coding |
| ENSG00000164532 | TBX20 | 2.431848671 | 1.69E-05 | protein_coding |
| ENSG00000109906 | ZBTB16 | 2.434070994 | 5.74E-05 | protein_coding |
| ENSG00000280987 | MATR3 | 2.439893911 | 0.010033723 | protein_coding |
| ENSG00000106125 | MINDY4 | 2.439893911 | 0.010033723 | protein_coding |
| ENSG00000104321 | TRPA1 | 2.439893911 | 0.010033723 | protein_coding |
| ENSG00000135913 | USP37 | 2.450374023 | 7.17E-08 | protein_coding |
| ENSG00000008311 | AASS | 2.450469332 | 9.42E-08 | protein_coding |
| ENSG00000171189 | GRIK1 | 2.451341722 | 0.003149424 | protein_coding |
| ENSG00000033122 | LRRC7 | 2.451585365 | 7.64E-05 | protein_coding |
| ENSG00000100852 | ARHGAP5 | 2.485741296 | 2.43E-08 | protein_coding |
| ENSG00000140009 | ESR2 | 2.495221266 | 5.31E-05 | protein_coding |

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| ENSG00000166439 | RNF169 | 2.496854103 | 2.59E-08 | protein_coding |
| ENSG00000163635 | ATXN7 | 2.505380121 | 0.000883969 | protein_coding |
| ENSG00000174130 | TLR6 | 2.509926229 | 0.002275868 | protein_coding |
| ENSG00000182108 | DEXI | 2.515317833 | 7.76E-07 | protein_coding |
| ENSG00000053328 | METTL24 | 2.51735492 | 0.006966163 | protein_coding |
| ENSG00000160229 | ZNF66 | 2.531680917 | 0.017862218 | protein_coding |
| ENSG00000197714 | ZNF460 | 2.53640587 | 6.32E-06 | protein_coding |
| ENSG00000133816 | MICAL2 | 2.542918878 | 2.45E-07 | protein_coding |
| ENSG00000172575 | RASGRP1 | 2.549679762 | 2.08E-06 | protein_coding |
| ENSG00000135436 | FAM186B | 2.566224299 | 0.001648699 | protein_coding |
| ENSG00000249931 | GOLGA8K | 2.566224299 | 0.001648699 | protein_coding |
| ENSG00000185900 | POMK | 2.575406271 | 5.31E-08 | protein_coding |
| ENSG00000137801 | THBS1 | 2.590867976 | 0.004849114 | protein_coding |
| ENSG00000198785 | GRIN3A | 2.620407719 | 0.001197455 | protein_coding |
| ENSG00000218305 | CDC14C | 2.637581188 | 0.011832427 | protein_coding |
| ENSG00000157999 | ANKRD61 | 2.64991994 | 0.000137515 | protein_coding |
| ENSG00000122420 | PTGFR | 2.660816067 | 0.003385132 | protein_coding |
| ENSG00000261732 | AL031708.1 | 2.727529021 | 0.002370371 | protein_coding |
| ENSG00000155011 | DKK2 | 2.736236676 | 0.007864773 | protein_coding |
| ENSG00000151322 | NPAS3 | 2.736236676 | 0.007864773 | protein_coding |
| ENSG00000248405 | PRR5- ARHGAP8 | 2.736236676 | 0.007864773 | protein_coding |
| ENSG00000144426 | NBEAL1 | 2.75269007 | 5.06E-08 | protein_coding |
| ENSG00000137959 | IFI44L | 2.771723241 | 0.000466301 | protein_coding |
| ENSG00000188211 | NCR3LG1 | 2.789086287 | 4.75E-10 | protein_coding |
| ENSG00000168454 | TXNDC2 | 2.79129291 | 0.001665133 | protein_coding |
| ENSG00000080200 | CRYBG3 | 2.810448053 | 7.49E-10 | protein_coding |
| ENSG00000175556 | LONRF3 | 2.827566775 | 1.97E-09 | protein_coding |
| ENSG00000187987 | ZSCAN23 | 2.864752801 | 2.96E-06 | protein_coding |
| ENSG00000134042 | MRO | 2.910941968 | 0.000829981 | protein_coding |
| ENSG00000136206 | SPDYE1 | 2.915358032 | 0.003515158 | protein_coding |
| ENSG00000283208 | AC001226.2 | 2.927583998 | 0.034866602 | protein_coding |
| ENSG00000175820 | CCDC168 | 2.927583998 | 0.034866602 | protein_coding |
| ENSG00000176153 | GPX2 | 2.927583998 | 0.034866602 | protein_coding |
| ENSG00000148082 | SHC3 | 2.927583998 | 0.034866602 | protein_coding |
| ENSG00000162753 | SLC9C2 | 2.927583998 | 0.034866602 | protein_coding |
| ENSG00000177301 | KCNA2 | 2.930698097 | 7.50E-06 | protein_coding |
| ENSG00000205413 | SAMD9 | 2.967240038 | 0.000589 | protein_coding |
| ENSG00000151967 | SCHIP1 | 2.993231159 | 0.000102431 | protein_coding |
| ENSG00000133107 | TRPC4 | 2.997215225 | 0.003515158 | protein_coding |
| ENSG00000185666 | SYN3 | 3.008844338 | 2.42E-05 | protein_coding |
| ENSG00000165521 | EML5 | 3.020040061 | 7.50E-10 | protein_coding |
| ENSG00000041353 | RAB27B | 3.073645355 | 0.000299755 | protein_coding |

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| ENSG00000129048 | ACKR4 | 3.074676234 | 0.002364823 | protein_coding |
| ENSG00000169435 | RASSF6 | 3.074676234 | 0.002364823 | protein_coding |
| ENSG00000165972 | CCDC38 | 3.077542886 | 0.021566548 | protein_coding |
| ENSG00000172404 | DNAJB7 | 3.077542886 | 0.021566548 | protein_coding |
| ENSG00000182732 | RGS6 | 3.077542886 | 0.021566548 | protein_coding |
| ENSG00000112212 | TSPO2 | 3.077542886 | 0.021566548 | protein_coding |
| ENSG00000178502 | KLHL11 | 3.180205542 | 1.51E-10 | protein_coding |
| ENSG00000283761 | AC118553.2 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000167601 | AXL | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000165168 | CYBB | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000122735 | DNAI1 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000184599 | FAM19A3 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000182329 | KIAA2012 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000262180 | OCLM | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000114757 | PEX5L | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000158683 | PKD1L1 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000165646 | SLC18A2 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000259224 | SLC35G6 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000105989 | WNT2 | 3.21337172 | 0.013412089 | protein_coding |
| ENSG00000131379 | C3orf20 | 3.218137381 | 0.001084588 | protein_coding |
| ENSG00000173157 | ADAMTS20 | 3.308352831 | 9.30E-08 | protein_coding |
| ENSG00000265107 | GJA5 | 3.337505542 | 0.008390282 | protein_coding |
| ENSG00000188921 | HACD4 | 3.337505542 | 0.008390282 | protein_coding |
| ENSG00000174145 | NWD2 | 3.337505542 | 0.008390282 | protein_coding |
| ENSG00000101349 | PAK5 | 3.337505542 | 0.008390282 | protein_coding |
| ENSG00000162924 | REL | 3.345425804 | 8.37E-12 | protein_coding |
| ENSG00000171217 | CLDN20 | 3.451799574 | 0.005281544 | protein_coding |
| ENSG00000204767 | INSYN2B | 3.451799574 | 0.005281544 | protein_coding |
| ENSG00000166800 | LDHAL6A | 3.451799574 | 0.005281544 | protein_coding |
| ENSG00000080854 | IGSF9B | 3.490554174 | 4.86E-11 | protein_coding |
| ENSG00000281106 | TMEM272 | 3.524561352 | 0.000167283 | protein_coding |
| ENSG00000196811 | CHRNA7 | 3.557699845 | 0.003346055 | protein_coding |
| ENSG00000108950 | FAM20A | 3.557699845 | 0.003346055 | protein_coding |
| ENSG00000164197 | RNF180 | 3.656355333 | 0.002133716 | protein_coding |
| ENSG00000104728 | ARHGAP10 | 3.656396259 | 3.89E-06 | protein_coding |
| ENSG00000157654 | PALM2- AKAP2 | 3.748694134 | 0.001369576 | protein_coding |
| ENSG00000187243 | MAGED4B | 3.758713601 | 1.10E-11 | protein_coding |
| ENSG00000132357 | CARD6 | 3.818196698 | 9.57E-07 | protein_coding |
| ENSG00000166960 | CCDC178 | 3.83547669 | 0.000884859 | protein_coding |
| ENSG00000103184 | SEC14L5 | 3.83547669 | 0.000884859 | protein_coding |
| ENSG00000243444 | PALM2 | 3.994794891 | 0.000575412 | protein_coding |
| ENSG00000267710 | EDDM13 | 4.204968992 | 0.000164371 | protein_coding |

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|-----------------|------------|-------------|-------------|----------------|
| ENSG00000188107 | EYS | 4.204968992 | 0.000164371 | protein_coding |
| ENSG00000197410 | DCHS2 | 4.329797432 | 7.35E-05 | protein_coding |
| ENSG00000261247 | GOLGA8T | 4.650178951 | 7.53E-06 | protein_coding |
| ENSG00000173208 | ABCD2 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000281593 | AC006978.2 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000273291 | AC092042.3 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000258466 | AL049779.1 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000164122 | ASB5 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000152430 | BOLL | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000181215 | C4orf50 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000123500 | COL10A1 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000124875 | CXCL6 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000173198 | CYSLTR1 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000124721 | DNAH8 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000170074 | FAM153A | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000164125 | FAM198B | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000115474 | KCNJ13 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000184261 | KCNK12 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000226650 | KIF4B | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000101977 | MCF2 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000162992 | NEUROD1 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000132915 | PDE6A | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000095303 | PTGS1 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000188050 | RNF133 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000106327 | TFR2 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000234224 | TMEM229A | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000049249 | TNFRSF9 | 5.567319661 | 0.040964585 | protein_coding |
| ENSG00000106927 | AMBP | 5.785358955 | 0.022676824 | protein_coding |
| ENSG00000091879 | ANGPT2 | 5.785358955 | 0.022676824 | protein_coding |
| ENSG00000164287 | CDC20B | 5.785358955 | 0.022676824 | protein_coding |
| ENSG00000104432 | IL7 | 5.785358955 | 0.022676824 | protein_coding |
| ENSG00000184361 | SPATA32 | 5.785358955 | 0.022676824 | protein_coding |
| ENSG00000116194 | ANGPTL1 | 5.974730546 | 0.012730848 | protein_coding |
| ENSG00000232196 | MTRNR2L4 | 5.974730546 | 0.012730848 | protein_coding |
| ENSG00000154645 | CHODL | 6.142104357 | 0.007243414 | protein_coding |
| ENSG00000143226 | FCGR2A | 6.142104357 | 0.007243414 | protein_coding |
| ENSG00000153253 | SCN3A | 6.142104357 | 0.007243414 | protein_coding |
| ENSG00000182584 | ACTL10 | 6.292063245 | 0.004174171 | protein_coding |
| ENSG00000124701 | APOBEC2 | 6.292063245 | 0.004174171 | protein_coding |
| ENSG00000205882 | DEFB134 | 6.292063245 | 0.004174171 | protein_coding |
| ENSG00000263874 | LINC00672 | 6.292063245 | 0.004174171 | protein_coding |
| ENSG00000115956 | PLEK | 6.292063245 | 0.004174171 | protein_coding |
| ENSG00000151062 | CACNA2D4 | 6.42789208 | 0.002434933 | protein_coding |

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|-----------------|-----------|-------------|-------------|----------------|
| ENSG00000135960 | EDAR | 6.42789208 | 0.002434933 | protein_coding |
| ENSG00000019991 | HGF | 6.42789208 | 0.002434933 | protein_coding |
| ENSG00000056291 | NPFFR2 | 6.42789208 | 0.002434933 | protein_coding |
| ENSG00000102359 | SRPX2 | 6.42789208 | 0.002434933 | protein_coding |
| ENSG00000276203 | ANKRD20A3 | 6.552025902 | 0.00143701 | protein_coding |
| ENSG00000127362 | TAS2R3 | 6.552025902 | 0.00143701 | protein_coding |
| ENSG00000257315 | ZBED6 | 6.552025902 | 0.00143701 | protein_coding |
| ENSG00000138379 | MSTN | 6.666319933 | 0.00085757 | protein_coding |
| ENSG00000113494 | PRLR | 6.666319933 | 0.00085757 | protein_coding |
| ENSG00000055813 | CCDC85A | 6.772220205 | 0.000517265 | protein_coding |
| ENSG00000204323 | SMIM5 | 6.870875693 | 0.000315208 | protein_coding |
| ENSG00000242950 | ERVW-1 | 6.963214494 | 0.000193974 | protein_coding |
| ENSG00000120215 | MLANA | 7.765605685 | 1.61E-06 | protein_coding |

| Genes differentially expressed in shBLM cells (p<0.05; log2FoldChang>1) | | | | |
|---|--------------|----------------|-------------|----------------|
| Gene_id | Gene_name | log2FoldChange | P value | Gene_biotype |
| ENSG00000162032 | SPSB3 | -7.339690146 | 3.05E-05 | protein_coding |
| ENSG00000130489 | SCO2 | -7.188676326 | 7.55E-05 | protein_coding |
| ENSG00000175832 | ETV4 | -7.019986963 | 0.000193974 | protein_coding |
| ENSG00000132518 | GUCY2D | -6.72298963 | 0.00085757 | protein_coding |
| ENSG00000254585 | MAGEL2 | -6.72298963 | 0.00085757 | protein_coding |
| ENSG00000100060 | MFNG | -6.608650041 | 0.00143701 | protein_coding |
| ENSG00000273154 | AL121845.3 | -6.484462474 | 0.002434933 | protein_coding |
| ENSG00000171847 | FAM90A1 | -6.484462474 | 0.002434933 | protein_coding |
| ENSG00000164855 | TMEM184A | -6.484462474 | 0.002434933 | protein_coding |
| ENSG00000261408 | TEN1-CDK3 | -6.348569279 | 0.004174171 | protein_coding |
| ENSG00000169744 | LDB2 | -6.198531926 | 0.007243414 | protein_coding |
| ENSG00000259305 | ZHX1-C8orf76 | -6.198531926 | 0.007243414 | protein_coding |
| ENSG00000224712 | NPIPA3 | -6.198531926 | 0.007243414 | protein_coding |
| ENSG00000102452 | NALCN | -6.198531926 | 0.007243414 | protein_coding |
| ENSG00000132274 | TRIM22 | -6.198531926 | 0.007243414 | protein_coding |
| ENSG00000006047 | YBX2 | -6.031060341 | 0.012730848 | protein_coding |
| ENSG00000114547 | ROPN1B | -6.031060341 | 0.012730848 | protein_coding |
| ENSG00000198844 | ARHGEF15 | -6.031060341 | 0.012730848 | protein_coding |
| ENSG00000010704 | HFE | -5.841563537 | 0.022676824 | protein_coding |
| ENSG00000169181 | GSG1L | -5.841563537 | 0.022676824 | protein_coding |
| ENSG00000158816 | VWA5B1 | -5.841563537 | 0.022676824 | protein_coding |
| ENSG00000109758 | HGFAC | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000132026 | RTBDN | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000182584 | ACTL10 | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000112245 | PTP4A1 | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000100985 | MMP9 | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000197479 | PCDHB11 | -5.623358155 | 0.040964585 | protein_coding |
| ENSG00000102931 | ARL2BP | -5.304971107 | 5.77E-15 | protein_coding |
| ENSG00000154545 | MAGED4 | -4.431882214 | 1.32E-16 | protein_coding |
| ENSG00000188263 | IL17REL | -4.314255447 | 0.000109596 | protein_coding |
| ENSG00000183153 | GJD3 | -4.177561833 | 0.000248027 | protein_coding |
| ENSG00000159884 | CCDC107 | -3.900509294 | 7.18E-10 | protein_coding |
| ENSG00000125533 | BHLHE23 | -3.765490121 | 0.002133716 | protein_coding |
| ENSG00000166920 | C15orf48 | -3.765490121 | 0.002133716 | protein_coding |
| ENSG00000128645 | HOXD1 | -3.666800696 | 0.003346055 | protein_coding |
| ENSG00000258674 | AC011448.1 | -3.626030568 | 9.35E-06 | protein_coding |
| ENSG00000127774 | EMC6 | -3.616919864 | 2.49E-07 | protein_coding |
| ENSG00000185105 | MYADML2 | -3.560861317 | 0.005281544 | protein_coding |
| ENSG00000241697 | TMEFF1 | -3.472256066 | 8.61E-08 | protein_coding |

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| ENSG00000171450 | CDK5R2 | -3.460955611 | 0.000348534 | protein_coding |
| ENSG00000167476 | JSRP1 | -3.446521728 | 0.008390282 | protein_coding |
| ENSG00000278558 | TMEM191B | -3.41803842 | 1.56E-06 | protein_coding |
| ENSG00000161958 | FGF11 | -3.397177551 | 0.000506526 | protein_coding |
| ENSG00000073067 | CYP2W1 | -3.322334161 | 0.013412089 | protein_coding |
| ENSG00000241360 | PDXP | -3.265392632 | 3.94E-12 | protein_coding |
| ENSG00000205670 | SMIM11A | -3.257429287 | 1.00E-09 | protein_coding |
| ENSG00000101084 | RAB5IF | -3.233948316 | 6.03E-12 | protein_coding |
| ENSG00000168282 | MGAT2 | -3.231665043 | 9.00E-07 | protein_coding |
| ENSG00000180875 | GREM2 | -3.186952043 | 0.001597933 | protein_coding |
| ENSG00000179388 | EGR3 | -3.186440965 | 0.021566548 | protein_coding |
| ENSG00000135144 | DTX1 | -3.186440965 | 0.021566548 | protein_coding |
| ENSG00000176472 | ZNF575 | -3.186440965 | 0.021566548 | protein_coding |
| ENSG00000128482 | RNF112 | -3.186440965 | 0.021566548 | protein_coding |
| ENSG00000058673 | ZC3H11A | -3.186440965 | 0.021566548 | protein_coding |
| ENSG00000244187 | TMEM141 | -3.173406503 | 3.81E-11 | protein_coding |
| ENSG00000181029 | TRAPPC5 | -3.126940244 | 1.03E-06 | protein_coding |
| ENSG00000179284 | DAND5 | -3.109470117 | 0.002364823 | protein_coding |
| ENSG00000184357 | HIST1H1B | -3.036403613 | 0.034866602 | protein_coding |
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| ENSG00000183346 | CABCO1 | 1.805030277 | 0.033376343 | protein_coding |
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| ENSG00000203872 | C6orf163 | 1.920202692 | 0.005911861 | protein_coding |
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| ENSG00000196335 | STK31 | 1.972160805 | 0.001027717 | protein_coding |
| ENSG00000120215 | MLANA | 2.036366746 | 0.023070854 | protein_coding |
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| ENSG00000242220 | TCP10L | 2.156489525 | 0.007167784 | protein_coding |
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| ENSG00000184113 | CLDN5 | 2.15915056 | 0.030348148 | protein_coding |
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| ENSG00000100298 | APOBEC3H | 2.469699457 | 0.003149424 | protein_coding |

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|-----------------|------------|-------------|-------------|----------------|
| ENSG00000132639 | SNAP25 | 2.5188635 | 0.006966163 | protein_coding |
| ENSG00000183889 | PKD1P1 | 2.576365131 | 2.97E-05 | protein_coding |
| ENSG00000120440 | TTLL2 | 2.585097769 | 0.000660977 | protein_coding |
| ENSG00000081041 | CXCL2 | 2.715709624 | 0.011832427 | protein_coding |
| ENSG00000124091 | GCNT7 | 2.715709624 | 0.011832427 | protein_coding |
| ENSG00000197153 | HIST1H3J | 2.715709624 | 0.011832427 | protein_coding |
| ENSG00000154263 | ABCA10 | 2.739825227 | 0.002370371 | protein_coding |
| ENSG00000166278 | C2 | 2.806548987 | 0.001665133 | protein_coding |
| ENSG00000127364 | TAS2R4 | 2.81438875 | 0.007864773 | protein_coding |
| ENSG00000276966 | HIST1H4E | 2.81438875 | 0.007864773 | protein_coding |
| ENSG00000169393 | ELSPBP1 | 2.993549101 | 0.003515158 | protein_coding |
| ENSG00000187944 | C2orf66 | 3.003396154 | 0.034866602 | protein_coding |
| ENSG00000083814 | ZNF671 | 3.003396154 | 0.034866602 | protein_coding |
| ENSG00000182916 | TCEAL7 | 3.003396154 | 0.034866602 | protein_coding |
| ENSG00000249156 | TAF11L12 | 3.003396154 | 0.034866602 | protein_coding |
| ENSG00000205572 | SERF1B | 3.061832655 | 1.02E-10 | protein_coding |
| ENSG00000104435 | STMN2 | 3.075422564 | 0.002364823 | protein_coding |
| ENSG00000187243 | MAGED4B | 3.116888107 | 3.93E-07 | protein_coding |
| ENSG00000151164 | RAD9B | 3.152898143 | 0.001597933 | protein_coding |
| ENSG00000267710 | EDDM13 | 3.152898143 | 0.001597933 | protein_coding |
| ENSG00000250673 | REELD1 | 3.153409692 | 0.021566548 | protein_coding |
| ENSG00000186453 | FAM228A | 3.153409692 | 0.021566548 | protein_coding |
| ENSG00000140093 | SERPINA10 | 3.251819569 | 0.000111734 | protein_coding |
| ENSG00000198939 | ZFP2 | 3.289283354 | 0.013412089 | protein_coding |
| ENSG00000124334 | IL9R | 3.289283354 | 0.013412089 | protein_coding |
| ENSG00000123338 | NCKAP1L | 3.289283354 | 0.013412089 | protein_coding |
| ENSG00000146674 | IGFBP3 | 3.41345461 | 0.008390282 | protein_coding |
| ENSG00000187398 | LUZP2 | 3.41345461 | 0.008390282 | protein_coding |
| ENSG00000127507 | ADGRE2 | 3.41345461 | 0.008390282 | protein_coding |
| ENSG00000078596 | ITM2A | 3.60285402 | 0.000116677 | protein_coding |
| ENSG00000102271 | KLHL4 | 5.068848838 | 1.08E-13 | protein_coding |
| ENSG00000000005 | TNMD | 5.277000344 | 5.34E-08 | protein_coding |
| ENSG00000176358 | TAC4 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000166869 | CHP2 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000169302 | STK32A | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000168404 | MLKL | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000261582 | AL121753.1 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000184995 | IFNE | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000179873 | NLRP11 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000168843 | FSTL5 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000078579 | FGF20 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000262576 | PCDHGA4 | 5.606115201 | 0.040964585 | protein_coding |
| ENSG00000178460 | MCMD2C2 | 5.824270165 | 0.022676824 | protein_coding |

| | | | | |
|-----------------|----------|-------------|-------------|----------------|
| ENSG00000147613 | PSKH2 | 5.824270165 | 0.022676824 | protein_coding |
| ENSG00000101842 | VSIG1 | 5.824270165 | 0.022676824 | protein_coding |
| ENSG00000126838 | PZP | 5.824270165 | 0.022676824 | protein_coding |
| ENSG00000138356 | AOX1 | 5.824270165 | 0.022676824 | protein_coding |
| ENSG00000185955 | C7orf61 | 5.824270165 | 0.022676824 | protein_coding |
| ENSG00000149970 | CNKSR2 | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000004948 | CALCR | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000010932 | FMO1 | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000162843 | WDR64 | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000124343 | XG | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000183378 | OVCH2 | 6.013728963 | 0.012730848 | protein_coding |
| ENSG00000213714 | FAM209B | 6.181170872 | 0.007243414 | protein_coding |
| ENSG00000172717 | FAM71D | 6.181170872 | 0.007243414 | protein_coding |
| ENSG00000230561 | CCDC192 | 6.181170872 | 0.007243414 | protein_coding |
| ENSG00000188037 | CLCN1 | 6.181170872 | 0.007243414 | protein_coding |
| ENSG00000050628 | PTGER3 | 6.331184409 | 0.004174171 | protein_coding |
| ENSG00000204287 | HLA-DRA | 6.331184409 | 0.004174171 | protein_coding |
| ENSG00000163705 | FANCD2OS | 6.331184409 | 0.004174171 | protein_coding |
| ENSG00000175426 | PCSK1 | 6.591229327 | 0.00143701 | protein_coding |
| ENSG00000001626 | CFTR | 6.811482601 | 0.000517265 | protein_coding |

| Commonly changed genes |
|-----------------------------------|
| Gene name |
| SPSB3 |
| AL121845.3 |
| TEN1-CDK3 |
| HGFAC |
| ACTL10 |
| MAGED4 |
| TMEFF1 |
| PDXP |
| SMIM11A |
| MGAT2 |
| GREM2 |
| TRAPPC5 |
| TMSB15B |
| SLC22A31 |
| CYP51A1 |
| TMEM160 |
| ATP6V0C |
| ALDOA |
| GPX2 |
| C22orf15 |
| PNMT |
| TSPO |
| PRR35 |
| MADCAM1 |
| GPS2 |
| ROM1 |
| MRPL12 |
| LAT |
| NPAS3 |
| C4orf48 |
| DPEP1 |
| AC020915.1 |
| CTXN1 |
| GOLGA8K |
| FES |
| CHADL |
| RABAC1 |
| COX6A1 |
| ALKBH7 |
| SHISA8 |

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|--------------------|
| SAC3D1 |
| GNG13 |
| SWSAP1 |
| CKMT2 |
| NME3 |
| NDUFA11 |
| MCRIP1 |
| TRPV2 |
| CITED4 |
| H1FX |
| CYBA |
| HAPLN2 |
| LAGE3 |
| HES4 |
| PRR19 |
| EMID1 |
| NUTM2G |
| CBARP |
| ARC |
| CSDC2 |
| AC093512.2 |
| MEGF6 |
| RTEL1- TNFRSF6B |
| CFAP157 |
| FAM173A |
| COX8A |
| RAC3 |
| KLF16 |
| ZNF428 |
| C8orf82 |
| CNIH2 |
| ADAM8 |
| PLK5 |
| VKORC1 |
| PRSS53 |
| ILVBL |
| SRPK3 |
| AL135905.2 |
| GNG5 |
| EPPK1 |
| PRR22 |
| ZDHHC12 |

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| NBL1 |
| FAM43B |
| TMEM256 |
| MYOF |
| F12 |
| ESX1 |
| KIFC2 |
| MAMDC4 |
| ZNF524 |
| PLEKHA4 |
| WDR90 |
| ZNF503 |
| ACADS |
| TP53I13 |
| DALRD3 |
| IFI6 |
| TMEM198 |
| NPDC1 |
| VPS37D |
| TNXB |
| IRF2BP1 |
| CFAP410 |
| CTU1 |
| ICAM5 |
| SOX15 |
| ZBTB16 |
| MRPL23 |
| LRRC56 |
| LIN37 |
| SCAF1 |
| CITED1 |
| ALDH16A1 |
| COMTD1 |
| TENM1 |
| C6orf48 |
| ZMYND10 |
| STIMATE |
| NDUFB2 |
| NAPRT |
| MXD3 |
| BCL7C |
| UQCC3 |
| SNRPB |

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| KIF26B |
| ARMC5 |
| TMEM121 |
| MOSPD3 |
| SAMD11 |
| MFSD10 |
| BX255925.3 |
| PTOV1 |
| STK11IP |
| PCSK1N |
| TPGS1 |
| HYAL2 |
| UCN |
| SMIM4 |
| POLR2L |
| GHDC |
| NMB |
| PGAP3 |
| ZGPAT |
| CYB561D2 |
| SDR39U1 |
| H2AFX |
| NUDT8 |
| P2RY11 |
| SPAG4 |
| TREX2 |
| SLC22A18 |
| CCNO |
| GAS2L1 |
| TWF2 |
| NRTN |
| TMEM150A |
| NFATC4 |
| RHOT2 |
| UBALD1 |
| DBP |
| NUBP2 |
| SMIM19 |
| CPLANE1 |
| EIF2S3B |
| CARD6 |
| CFAP44 |
| GPR89A |

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|------------|
| C1orf54 |
| TBC1D3D |
| MORC3 |
| TPT1 |
| GCC2 |
| AKAP9 |
| MIS18BP1 |
| ANKRD26 |
| BRCA2 |
| KIAA1551 |
| POLK |
| ANAPC10 |
| CEP290 |
| SLFN5 |
| TRIP11 |
| ANKRD36B |
| SYTL5 |
| SLC27A6 |
| SERPINB9 |
| USP6 |
| FSIP2 |
| SPDYE1 |
| COL6A6 |
| MLANA |
| EYS |
| KIF4B |
| SERF1B |
| MAGED4B |
| EDDM13 |
| TNMD |
| CNKSR2 |
| CFTR |
| Gene name |
| SPSB3 |
| AL121845.3 |
| TEN1-CDK3 |
| HGFAC |
| ACTL10 |
| MAGED4 |
| TMEFF1 |
| PDXP |
| SMIM11A |
| MGAT2 |

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|------------|
| GREM2 |
| TRAPPC5 |
| TMSB15B |
| SLC22A31 |
| CYP51A1 |
| TMEM160 |
| ATP6V0C |
| ALDOA |
| GPX2 |
| C22orf15 |
| PNMT |
| TSPO |
| PRR35 |
| MADCAM1 |
| GPS2 |
| ROM1 |
| MRPL12 |
| LAT |
| NPAS3 |
| C4orf48 |
| DPEP1 |
| AC020915.1 |
| CTXN1 |
| GOLGA8K |
| FES |
| CHADL |
| RABAC1 |
| COX6A1 |
| ALKBH7 |
| SHISA8 |
| SAC3D1 |
| GNG13 |
| SWSAP1 |
| CKMT2 |
| NME3 |
| NDUFA11 |
| MCRIP1 |
| TRPV2 |
| CITED4 |
| H1FX |
| CYBA |
| HAPLN2 |
| LAGE3 |

| |
|--------------------|
| HES4 |
| PRR19 |
| EMID1 |
| NUTM2G |
| CBARP |
| ARC |
| CSDC2 |
| AC093512.2 |
| MEGF6 |
| RTEL1- TNFRSF6B |
| CFAP157 |
| FAM173A |
| COX8A |
| RAC3 |
| KLF16 |
| ZNF428 |
| C8orf82 |
| CNIH2 |
| ADAM8 |
| PLK5 |
| VKORC1 |
| PRSS53 |
| ILVBL |
| SRPK3 |
| AL135905.2 |
| GNG5 |
| EPPK1 |
| PRR22 |
| ZDHHC12 |
| NBL1 |
| FAM43B |
| TMEM256 |
| MYOF |
| F12 |
| ESX1 |
| KIFC2 |
| MAMDC4 |
| ZNF524 |
| PLEKHA4 |
| WDR90 |
| ZNF503 |
| ACADS |

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|------------|
| TP53I13 |
| DALRD3 |
| IFI6 |
| TMEM198 |
| NPDC1 |
| VPS37D |
| TNXB |
| IRF2BP1 |
| CFAP410 |
| CTU1 |
| ICAM5 |
| SOX15 |
| ZBTB16 |
| MRPL23 |
| LRRC56 |
| LIN37 |
| SCAF1 |
| CITED1 |
| ALDH16A1 |
| COMTD1 |
| TENM1 |
| C6orf48 |
| ZMYND10 |
| STIMATE |
| NDUFB2 |
| NAPRT |
| MXD3 |
| BCL7C |
| UQCC3 |
| SNRPB |
| KIF26B |
| ARMC5 |
| TMEM121 |
| MOSPD3 |
| SAMD11 |
| MFSD10 |
| BX255925.3 |
| PTOV1 |
| STK11IP |
| PCSK1N |
| TPGS1 |
| HYAL2 |
| UCN |

| |
|----------|
| SMIM4 |
| POLR2L |
| GHDC |
| NMB |
| PGAP3 |
| ZGPAT |
| CYB561D2 |
| SDR39U1 |
| H2AFX |
| NUDT8 |
| P2RY11 |
| SPAG4 |
| TREX2 |
| SLC22A18 |
| CCNO |
| GAS2L1 |
| TWF2 |
| NRTN |
| TMEM150A |
| NFATC4 |
| RHOT2 |
| UBALD1 |
| DBP |
| NUBP2 |
| SMIM19 |
| CPLANE1 |
| EIF2S3B |
| CARD6 |
| CFAP44 |
| GPR89A |
| C1orf54 |
| TBC1D3D |
| MORC3 |
| TPT1 |
| GCC2 |
| AKAP9 |
| MIS18BP1 |
| ANKRD26 |
| BRCA2 |
| KIAA1551 |
| POLK |
| ANAPC10 |
| CEP290 |

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|----------|
| SLFN5 |
| TRIP11 |
| ANKRD36B |
| SYTL5 |
| SLC27A6 |
| SERPINB9 |
| USP6 |
| FSIP2 |
| SPDYE1 |
| COL6A6 |
| MLANA |
| EYS |
| KIF4B |
| SERF1B |
| MAGED4B |
| EDDM13 |
| TNMD |
| CNKSR2 |
| CFTR |