

Table S1 Sequences of primers used for Sanger sequencing for rs1553867776 and quantitative real-time PCR

| Sequences of primers used for Sanger sequencing for rs1553867776 | Primer sequence (5' →3') |
|--|---|
| | Forward primer: AGCATCCAATCTGGTAGGCG Reverse primer: TTCTACTAGCTGGCACGCTG |
| Primers used for quantitative real-time PCR | Primer sequence (5' →3') |
| miR-4274 | Forward primer: CGCGCAGCAGTCCCTC Reverse primer: AGTGCAGGGTCCGAGGTATT |
| U6 | Forward primer: CTCGCTTCGGCAGCACA Reverse primer: AACGCTTCACGAATTTGCGT |
| PEX5 | Forward primer: GTGCTCTACCTGGCT Reverse primer: CTGAAGTGTCTGCTCCTAC |
| ABCA7 | Forward primer: CCCTCAACTGGTACGAGGCTA Reverse primer: AGCTTCCGGTAAAAGGTGTA |
| AEN | Forward primer: CAAGTGTGGCTATCGACTG Reverse primer: CACTCCAGCGGGTACGGTA |
| DDB2 | Forward primer: TCCTAGCAGAAGATGTGACTCA Reverse primer: CACGCCAAGGATGTAGCCC |
| FANCD2 | Forward primer: AAAACGGGAGAGAGTCAGAATCA Reverse primer: ACGCTCACAAGACAAAAGGCA |
| GADD45A | Forward primer: GAGAGCAGAAGACCGAAAGGA Reverse primer: CAGTGATCGTGCCTGACT |
| BAX | Forward primer: CCCGAGAGGTCTTTTTCCGAG Reverse primer: CCAGCCATGATGGTTCTGAT |
| RBM4 | Forward primer: CATGAGCTATGGGGATTCAATTGT Reverse primer: GGCTGTATTCTGGACTTGTGG |
| CASP9 | Forward primer: CTCAGACCAGAGATTCGCAAAC Reverse primer: GCATTTCCCCTCAAACCTCTCAA |
| TP53INP1 | Forward primer: TTCCTCCAACCAAGAACCAGA Reverse primer: GCTCAGTAGGTGACTCTTCACT |
| CDKN1A- | Forward primer: TGTCCGTCAGAACCCATGC Reverse primer: AAAGTCGAAGTTCCATCGCTC |
| GAPDH | Forward primer: AACGGATTTGGTTCGATTGGG Reverse primer: TGATTTTGGAGGGATCTCGC |
| Sg-RNA used for PEX5 knockout | |
| PEX5 KO#1 | TGAGCAGTCAAACCTCCGCC |
| PEX5 KO#2 | CGATCGGTGGCTGTTCCCTC |

Table S2 Predicted targets of hsa-miR-4274

| Target gene | Representative transcript | Gene name |
|-------------|---------------------------|---|
| PSIP1 | ENST00000380738.4 | PC4 and SFRS1 interacting protein 1 |
| PER2 | ENST00000254658.3 | period circadian clock 2 |
| PEX5 | ENST00000266563.5 | peroxisomal biogenesis factor 5 |
| TRA2B | ENST00000453386.2 | transformer 2 beta homolog (Drosophila) |
| TMEM115 | ENST00000266025.3 | transmembrane protein 115 |
| DNAJC13 | ENST00000260818.6 | DnaJ (Hsp40) homolog, subfamily C, member 13 |
| HIF1AN | ENST00000299163.6 | hypoxia inducible factor 1, alpha subunit inhibitor |
| BRDT | ENST00000399546.2 | bromodomain, testis-specific |
| ELMOD1 | ENST00000265840.7 | ELMO/CED-12 domain containing 1 |
| VPS13A | ENST00000360280.3 | vacuolar protein sorting 13 homolog A (S. cerevisiae) |
| ZNF367 | ENST00000375256.4 | zinc finger protein 367 |
| LRP4 | ENST00000378623.1 | low density lipoprotein receptor-related protein 4 |
| KCNIP2 | ENST00000348850.5 | Kv channel interacting protein 2 |
| RAB14 | ENST00000373840.4 | RAB14, member RAS oncogene family |
| PCDH9 | ENST00000377861.3 | protocadherin 9 |
| RTF1 | ENST00000389629.4 | Rtf1, Paf1/RNA polymerase II complex component, homolog (S. cerevisiae) |
| NRK | ENST00000243300.9 | Nik related kinase |
| QKI | ENST00000392127.2 | QKI, KH domain containing, RNA binding |
| UBE2D2 | ENST00000398733.3 | ubiquitin-conjugating enzyme E2D 2 |
| TM9SF3 | ENST00000371142.4 | transmembrane 9 superfamily member 3 |
| CDC14A | ENST00000370125.2 | cell division cycle 14A |
| PRKG1 | ENST00000373985.1 | protein kinase, cGMP-dependent, type I syntrophin, beta 2 (dystrophin-associated protein A1, 59kDa, basic component 2) |
| SNTB2 | ENST00000336278.4 | 59kDa, basic component 2) |
| RRP1B | ENST00000340648.4 | ribosomal RNA processing 1B |
| LRRC1 | ENST00000370888.1 | leucine rich repeat containing 1 |
| MECOM | ENST00000460814.1 | MDS1 and EVI1 complex locus |
| KLF12 | ENST00000377669.2 | Kruppel-like factor 12 |
| IMPACT | ENST00000284202.4 | impact RWD domain protein |
| ANKS1B | ENST00000546960.1 | ankyrin repeat and sterile alpha motif domain containing 1B |

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| | | dual-specificity |
| | | tyrosine-(Y)-phosphorylation regulated |
| DYRK1A | ENST00000339659.4 | kinase 1A |
| RYBP | ENST00000477973.2 | RING1 and YY1 binding protein |
| TSC1 | ENST00000298552.3 | tuberous sclerosis 1 |
| | | phosphoinositide-3-kinase, regulatory |
| PIK3R3 | ENST00000262741.5 | subunit 3 (gamma) |
| | | calcium/calmodulin-dependent protein |
| CAMK4 | ENST00000282356.4 | kinase IV |
| LOXL4 | ENST00000260702.3 | lysyl oxidase-like 4 |
| RNF111 | ENST00000348370.4 | ring finger protein 111 |
| TEX2 | ENST00000258991.3 | testis expressed 2 |
| | | X-linked Kx blood group (McLeod |
| XK | ENST00000378616.3 | syndrome) |
| | | potassium voltage-gated channel, |
| KCNC1 | ENST00000379472.3 | Shaw-related subfamily, member 1 |
| DLL1 | ENST00000366756.3 | delta-like 1 (Drosophila) |
| | | solute carrier family 4 (sodium |
| SLC4A4 | ENST00000340595.3 | bicarbonate cotransporter), member 4 |
| WNK3 | ENST00000375169.3 | WNK lysine deficient protein kinase 3 |
| ARHGAP17 | ENST00000441763.2 | Rho GTPase activating protein 17 |
| | | transforming, acidic coiled-coil |
| TACC1 | ENST00000330691.6 | containing protein 1 |
| PLAG1 | ENST00000316981.3 | pleiomorphic adenoma gene 1 |
| CDC73 | ENST00000367435.3 | cell division cycle 73 |
| | | SMG7 nonsense mediated mRNA |
| SMG7 | ENST00000367537.3 | decay factor |
| COCH | ENST00000396618.3 | cochlin |
| POU2F1 | ENST00000367866.2 | POU class 2 homeobox 1 |
| MAP1A | ENST00000382031.1 | microtubule-associated protein 1A |
| DOCK3 | ENST00000266037.9 | dedicator of cytokinesis 3 |
| | | transducin (beta)-like 1 X-linked |
| TBL1XR1 | ENST00000430069.1 | receptor 1 |
| | | phosphatidylinositol transfer protein, |
| PITPNC1 | ENST00000580974.1 | cytoplasmic 1 |

Table S3 The RNA-sequencing results of HCT116 cells with PEX5 knockout

| Gene | log ₂ (fold change) | <i>P</i> |
|------------|--------------------------------|----------|
| PEX5 | -1.35 | 0.00 |
| DUSP6 | 0.54 | 0.00 |
| AREG | 0.44 | 0.00 |
| FOS | -0.51 | 0.00 |
| ADAM19 | 0.50 | 0.00 |
| CDKN1A | -0.35 | 0.00 |
| TPBG | -0.44 | 0.00 |
| CYP24A1 | 0.49 | 0.00 |
| ARHGAP29 | 0.49 | 0.00 |
| SAT1 | 0.38 | 0.00 |
| CDCP1 | 0.31 | 0.00 |
| PHC2 | 0.27 | 0.00 |
| DUSP5 | 0.35 | 0.00 |
| ZDHHC2 | 0.38 | 0.00 |
| KIAA0040 | 0.67 | 0.00 |
| IER3 | 0.27 | 0.00 |
| ERRFI1 | 0.34 | 0.00 |
| DKK1 | -0.32 | 0.00 |
| ASPH | 0.26 | 0.00 |
| JAG1 | 0.42 | 0.00 |
| SYTL2 | -0.48 | 0.00 |
| FDXR | -0.30 | 0.00 |
| BAX | -0.28 | 0.00 |
| ACSL5 | 0.21 | 0.00 |
| EFNB2 | 0.35 | 0.00 |
| ANGPTL4 | 0.50 | 0.00 |
| DCBLD2 | 0.16 | 0.00 |
| VCAN | 0.37 | 0.00 |
| F2RL1 | 0.22 | 0.00 |
| RHOBTB3 | 0.33 | 0.00 |
| TPM4 | 0.19 | 0.00 |
| FAM3C | 0.21 | 0.00 |
| H1F0 | 0.20 | 0.00 |
| FGF19 | 0.35 | 0.00 |
| H19 | 2.71 | 0.00 |
| EPS8L2 | -0.23 | 0.00 |
| DSC2 | 0.26 | 0.00 |
| EREG | 0.21 | 0.00 |
| SPRY4 | 0.27 | 0.00 |
| WNT16 | 0.35 | 0.00 |
| SLC4A1APP1 | -3.31 | 0.00 |
| P4HA1 | 0.33 | 0.00 |

| | | |
|------------|-------|------|
| ENC1 | 0.32 | 0.00 |
| RGPD5 | 1.73 | 0.00 |
| PHLDA1 | 0.18 | 0.00 |
| ACTG1 | 0.15 | 0.00 |
| FOSB | -0.35 | 0.00 |
| FOXC1 | 0.26 | 0.00 |
| MDM2 | -0.23 | 0.00 |
| EMP1 | 0.26 | 0.00 |
| TANK | 0.29 | 0.00 |
| RPS27L | -0.27 | 0.00 |
| BTG2 | -0.32 | 0.00 |
| LGALS1 | 0.19 | 0.00 |
| PDLIM5 | 0.24 | 0.00 |
| SERPINB5 | -0.31 | 0.00 |
| TNS4 | 0.28 | 0.00 |
| NFIL3 | 0.33 | 0.00 |
| ITGB1 | 0.17 | 0.00 |
| MAGI1 | 0.30 | 0.00 |
| EPN3 | -0.40 | 0.00 |
| NR2F1 | 0.22 | 0.00 |
| PHLDA3 | -0.31 | 0.00 |
| ZFP36L2 | -0.22 | 0.00 |
| CSAG2 | -0.94 | 0.00 |
| MT1E | -0.17 | 0.00 |
| TBC1D8 | 0.31 | 0.00 |
| AC097478.1 | -0.56 | 0.00 |
| COL17A1 | -0.52 | 0.00 |
| DUSP4 | 0.21 | 0.00 |
| GJB2 | 0.27 | 0.00 |
| EHBP1 | 0.26 | 0.00 |
| DHRS2 | -0.52 | 0.00 |
| SFN | -0.20 | 0.00 |
| ITPRID2 | 0.14 | 0.00 |
| SNHG4 | -0.27 | 0.00 |
| SSH1 | 0.26 | 0.00 |
| ANKH | 0.30 | 0.00 |
| CYB5B | 0.14 | 0.00 |
| GRIN2C | -0.56 | 0.00 |
| EGFR | 0.28 | 0.00 |
| TP53INP1 | -0.33 | 0.00 |
| ALDH1A3 | -0.23 | 0.00 |
| HPCAL1 | 0.21 | 0.00 |
| HOXB9 | 0.30 | 0.00 |
| EEF1A1P5 | 0.25 | 0.00 |

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|----------|-------|------|
| TEAD1 | 0.20 | 0.00 |
| B4GALT6 | 0.51 | 0.00 |
| PHPT1 | -0.24 | 0.00 |
| RSRP1 | -0.30 | 0.00 |
| CNTNAP3B | 0.74 | 0.00 |
| COL5A1 | -3.53 | 0.00 |
| NPC1 | 0.30 | 0.00 |
| NDUFAF8 | -0.24 | 0.00 |
| EPS8 | 0.23 | 0.00 |
| HSP90B1 | 0.13 | 0.00 |
| SERPINH1 | -0.18 | 0.00 |
| SPTLC1P1 | -5.14 | 0.00 |
| GPAT3 | 0.32 | 0.00 |
| TRIP6 | -0.18 | 0.00 |
| KLF6 | 0.25 | 0.00 |
| PLCD3 | -0.22 | 0.00 |
| LDLR | 0.19 | 0.00 |
| TMEM125 | -0.38 | 0.00 |
| WLS | 0.21 | 0.00 |
| NUP210 | 0.19 | 0.00 |
| SOX9 | 0.21 | 0.00 |
| HAS3 | 0.21 | 0.00 |
| SLC30A1 | -0.31 | 0.00 |
| PLAUR | 0.30 | 0.00 |
| CECR2 | 0.56 | 0.00 |
| TSC22D1 | 0.17 | 0.00 |
| FERMT1 | 0.24 | 0.00 |
| SYT1 | 0.27 | 0.00 |
| TP53I3 | -0.38 | 0.00 |
| UNC13A | 0.30 | 0.00 |
| KCNH3 | -0.18 | 0.00 |
| TOP1 | 0.14 | 0.00 |
| EVPL | 0.20 | 0.00 |
| RPS6KA5 | 0.61 | 0.00 |
| MACF1 | 0.18 | 0.00 |
| CDC20 | -0.17 | 0.00 |
| ISYNA1 | -0.16 | 0.00 |
| SNORD104 | -0.46 | 0.00 |
| UBALD2 | 0.21 | 0.00 |
| SNHG3 | -0.20 | 0.00 |
| PTPN12 | 0.19 | 0.00 |
| SRGN | -5.07 | 0.00 |
| ETV1 | 0.33 | 0.00 |
| FAM110C | 0.34 | 0.00 |

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| AGO2 | 0.18 | 0.00 |
| NT5E | 0.42 | 0.00 |
| APOBEC3G | 0.77 | 0.00 |
| BHLHE40 | 0.34 | 0.00 |
| SQLE | 0.19 | 0.00 |
| CANX | 0.13 | 0.00 |
| NOTCH1 | -0.23 | 0.00 |
| GADD45A | -0.20 | 0.00 |
| RNF182 | 0.56 | 0.00 |
| MYO1E | 0.21 | 0.00 |
| NET1 | 0.20 | 0.00 |
| APOBEC3C | 0.19 | 0.00 |
| MROH6 | -0.18 | 0.00 |
| ZDHHC20 | 0.17 | 0.00 |
| FUT8 | 0.29 | 0.00 |
| NPIP4 | -1.71 | 0.00 |
| RAD23B | 0.13 | 0.00 |
| TSPAN5 | 0.18 | 0.00 |
| IGF2BP2 | 0.16 | 0.00 |
| AC025419.1 | 0.71 | 0.00 |
| PRF1 | 0.39 | 0.01 |
| AL117332.1 | -1.37 | 0.01 |
| HMGB1P10 | 0.96 | 0.01 |
| MT-ND2 | -0.13 | 0.01 |
| IGFBP6 | -0.21 | 0.01 |
| ARHGAP42 | 0.36 | 0.01 |
| NDRG1 | 0.62 | 0.01 |
| DDR1 | 0.14 | 0.01 |
| NDFIP1 | 0.16 | 0.01 |
| PMPCA | -0.14 | 0.01 |
| GOLGA2 | 0.20 | 0.01 |
| SHC1 | 0.16 | 0.01 |
| HDAC4 | 0.29 | 0.01 |
| PDIA6 | 0.17 | 0.01 |
| TMEM158 | 0.29 | 0.01 |
| PLIN2 | 0.23 | 0.01 |
| SP1 | 0.17 | 0.01 |
| AC015813.6 | -0.35 | 0.01 |
| PROM2 | -0.38 | 0.01 |
| CDC42BPB | 0.19 | 0.01 |
| SCNN1A | 0.21 | 0.01 |
| RPL7AP6 | -0.37 | 0.01 |
| SEMA3A | 0.37 | 0.01 |
| HNRNPA1P10 | 0.39 | 0.01 |

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| GABARAPL1 | 0.25 | 0.01 |
| P4HB | 0.11 | 0.01 |
| AC007382.1 | 1.38 | 0.01 |
| EZR | 0.12 | 0.01 |
| MIR503HG | -1.23 | 0.01 |
| MORN4 | -0.61 | 0.01 |
| GANAB | 0.15 | 0.01 |
| CD109 | 0.20 | 0.01 |
| NTSR1 | 0.14 | 0.01 |
| HOXB8 | 0.23 | 0.01 |
| SNX30 | 0.29 | 0.01 |
| ABCA7 | -0.15 | 0.01 |
| MYBPC3 | -1.49 | 0.01 |
| AL390026.1 | -4.60 | 0.01 |
| TMEM69 | -0.22 | 0.01 |
| DDTL | -0.67 | 0.01 |
| GATA2 | -0.21 | 0.01 |
| CAMK2D | 0.20 | 0.01 |
| EPHA2 | 0.15 | 0.01 |
| ADGRG6 | 0.24 | 0.01 |
| FAM3C2 | 0.50 | 0.01 |
| PSD3 | 0.28 | 0.01 |
| PPARD | 0.20 | 0.01 |
| ZFYVE28 | 0.30 | 0.01 |
| SERPINB9 | 0.26 | 0.01 |
| TCF7L2 | 0.14 | 0.01 |
| KLF8 | -1.09 | 0.01 |
| PDLIM3 | 0.45 | 0.01 |
| VIM | -1.56 | 0.01 |
| EEF1A1 | 0.09 | 0.01 |
| ALOX5 | -0.44 | 0.01 |
| SMAD2 | 0.17 | 0.01 |
| DPY19L1 | 0.16 | 0.01 |
| DNAJB11 | 0.22 | 0.01 |
| PDE4B | 0.15 | 0.01 |
| AC011483.1 | -4.60 | 0.01 |
| GEMIN8 | 0.48 | 0.01 |
| TRIAP1 | -0.18 | 0.01 |
| HDDC2 | -0.16 | 0.01 |
| OCLM | 4.03 | 0.01 |
| RBMS1 | 0.29 | 0.01 |
| S100A2 | -0.28 | 0.01 |
| RPS20P14 | -0.48 | 0.01 |
| NR4A2 | 0.31 | 0.01 |

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| TINAGL1 | 0.19 | 0.01 |
| FOXD4 | -0.46 | 0.01 |
| SPATA18 | -0.92 | 0.01 |
| AUH | 0.28 | 0.01 |
| INPP1 | 0.29 | 0.01 |
| RHBDL1 | -0.27 | 0.01 |
| PLA2G2F | -3.49 | 0.01 |
| ANO1 | 0.20 | 0.01 |
| PDIA4 | 0.12 | 0.01 |
| AEN | -0.17 | 0.01 |
| AL391244.3 | -0.50 | 0.01 |
| GPR87 | -1.07 | 0.01 |
| PDIA3 | 0.13 | 0.01 |
| RETREG3 | 0.20 | 0.01 |
| UCA1 | 0.21 | 0.01 |
| SDCBP | 0.14 | 0.01 |
| MAP1LC3C | -4.58 | 0.01 |
| TNFRSF10D | 0.19 | 0.01 |
| YES1 | 0.14 | 0.01 |
| RAC3 | -0.14 | 0.01 |
| SMG6 | 0.40 | 0.01 |
| PTX3 | -2.24 | 0.01 |
| PATJ | 0.21 | 0.01 |
| ITGB5 | 0.16 | 0.01 |
| AC215522.2 | -4.48 | 0.01 |
| SLC16A6 | 0.43 | 0.01 |
| HOXB4 | 0.32 | 0.01 |
| STN1 | 0.19 | 0.01 |
| DOP1A | -0.52 | 0.01 |
| KDM3A | 0.24 | 0.01 |
| TRAF4 | -0.15 | 0.01 |
| C1R | -0.65 | 0.01 |
| SLC45A1 | 0.30 | 0.01 |
| KLF9 | 0.48 | 0.01 |
| PLOD1 | 0.13 | 0.01 |
| ZNF232 | 0.41 | 0.01 |
| RUNX1 | 0.33 | 0.01 |
| BAZ2A | 0.18 | 0.01 |
| DDB2 | -0.19 | 0.01 |
| NECTIN4 | -0.71 | 0.01 |
| LNPB | 0.22 | 0.01 |
| TGM1 | -0.61 | 0.01 |
| DACT1 | 0.94 | 0.01 |
| SRM | -0.16 | 0.01 |

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|------------|-------|------|
| PNPLA8 | 0.31 | 0.01 |
| AC020916.1 | -0.32 | 0.01 |
| APLP2 | 0.13 | 0.01 |
| TRIP13 | -0.19 | 0.01 |
| IRF2BPL | 0.21 | 0.01 |
| TONSL | -0.13 | 0.01 |
| HDAC5 | 0.19 | 0.01 |
| ELK3 | 0.20 | 0.01 |
| SGPP2 | -0.44 | 0.01 |
| DUSP1 | -0.26 | 0.01 |
| AP000759.1 | 1.21 | 0.01 |
| MALL | 0.30 | 0.01 |
| SNAPC4 | -0.18 | 0.01 |
| AC024909.2 | 1.21 | 0.01 |
| MYADM | 0.21 | 0.01 |
| ISG15 | -0.16 | 0.01 |
| MARF1 | 0.22 | 0.01 |
| MTND1P23 | -0.90 | 0.01 |
| C11orf86 | 2.99 | 0.01 |
| SNHG7 | -0.16 | 0.01 |
| SDC4 | 0.17 | 0.01 |
| GRAMD1B | 0.43 | 0.01 |
| PDGFB | 0.38 | 0.01 |
| USP12 | 0.18 | 0.01 |
| MIR3936HG | -1.01 | 0.01 |
| COL3A1 | -4.02 | 0.01 |
| S100A16 | 0.14 | 0.01 |
| HIVEP3 | 0.37 | 0.01 |
| LINC02012 | -1.77 | 0.01 |
| TNPO3 | 0.15 | 0.01 |
| AP001619.2 | -4.35 | 0.01 |
| MSX2 | -0.20 | 0.01 |
| AC087632.1 | 4.39 | 0.01 |
| HSPE1P4 | -4.35 | 0.02 |
| MYRF | 0.16 | 0.02 |
| KLHL17 | -0.17 | 0.02 |
| VASP | 0.14 | 0.02 |
| AC011510.1 | -4.35 | 0.02 |
| JCAD | 0.34 | 0.02 |
| GPR156 | -3.92 | 0.02 |
| UACA | 0.23 | 0.02 |
| MSLN | -0.17 | 0.02 |
| RUNX2 | 0.31 | 0.02 |
| PITPNC1 | 0.19 | 0.02 |

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| BZW1 | 0.11 | 0.02 |
| RFLNB | 0.18 | 0.02 |
| ITPRIP | 0.24 | 0.02 |
| HYOU1 | 0.13 | 0.02 |
| SLC25A22 | -0.17 | 0.02 |
| SNX9 | 0.17 | 0.02 |
| AC040162.1 | -0.75 | 0.02 |
| POLR2K | -0.16 | 0.02 |
| MANEAL | -0.29 | 0.02 |
| SPTSSB | 0.39 | 0.02 |
| PGK1 | 0.13 | 0.02 |
| TRIM14 | -0.22 | 0.02 |
| AP005264.5 | 2.62 | 0.02 |
| NIPA1 | 0.22 | 0.02 |
| FAT1 | 0.11 | 0.02 |
| KRT80 | -0.60 | 0.02 |
| FASN | -0.09 | 0.02 |
| SLC16A3 | 0.11 | 0.02 |
| TLR5 | 1.28 | 0.02 |
| ARID3A | 0.27 | 0.02 |
| C19orf48 | -0.12 | 0.02 |
| FBRSL1 | -0.12 | 0.02 |
| GRHL3 | -0.34 | 0.02 |
| PXN | 0.14 | 0.02 |
| PTAFR | -0.57 | 0.02 |
| TMED10 | 0.11 | 0.02 |
| OSMR | 0.19 | 0.02 |
| THOC6 | -0.17 | 0.02 |
| WTAP | -0.14 | 0.02 |
| DGUOK-AS1 | -0.47 | 0.02 |
| LYSMD2 | -0.29 | 0.02 |
| NFE2L1 | 0.15 | 0.02 |
| ITGA6 | 0.16 | 0.02 |
| PRMT7 | -0.24 | 0.02 |
| PFKP | 0.13 | 0.02 |
| EHF | 0.25 | 0.02 |
| KCTD9 | 0.23 | 0.02 |
| SATB2 | 0.27 | 0.02 |
| ACKR4 | -2.84 | 0.02 |
| NECTIN1 | -0.18 | 0.02 |
| ARL6IP6 | 0.23 | 0.02 |
| AL157400.3 | -1.96 | 0.02 |
| HIGD1A | -0.16 | 0.02 |
| NEO1 | 0.19 | 0.02 |

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|------------|-------|------|
| TMBIM6 | 0.10 | 0.02 |
| BLOC1S2 | -0.15 | 0.02 |
| PLOD2 | 0.21 | 0.02 |
| CDKN3 | -0.19 | 0.02 |
| DPP4 | -0.24 | 0.02 |
| MFSD2A | -0.37 | 0.02 |
| ARRDC2 | 0.19 | 0.02 |
| MXI1 | 0.17 | 0.02 |
| DSP | 0.12 | 0.02 |
| TRIM8 | 0.16 | 0.02 |
| FANCD2 | -0.20 | 0.02 |
| RILP | -0.36 | 0.02 |
| RINL | -0.21 | 0.02 |
| CCNB1 | -0.11 | 0.02 |
| WDR20 | -0.26 | 0.02 |
| KCNN4 | 0.17 | 0.02 |
| MAGEA2 | -1.07 | 0.02 |
| BNIP3L | 0.19 | 0.02 |
| ANO6 | 0.18 | 0.02 |
| ITGA5 | 0.17 | 0.02 |
| MIR34AHG | -0.39 | 0.02 |
| BSDC1 | 0.22 | 0.02 |
| FGD5-AS1 | -0.17 | 0.02 |
| YWHAZ | 0.09 | 0.02 |
| MLPH | 0.18 | 0.02 |
| TBL1XR1 | 0.13 | 0.02 |
| NCOA1 | 0.33 | 0.02 |
| MRGPRF | -0.95 | 0.02 |
| WWTR1 | 0.22 | 0.02 |
| HCFC1R1 | -0.23 | 0.02 |
| SNORA66 | -1.09 | 0.02 |
| AC016571.1 | 3.22 | 0.02 |
| SCD | 0.12 | 0.02 |
| MAFF | 0.24 | 0.02 |
| PRSS22 | 0.29 | 0.02 |
| CORO6 | -0.28 | 0.02 |
| SLC17A5 | 0.20 | 0.02 |
| CAPN10-DT | -0.68 | 0.02 |
| C14orf93 | -0.37 | 0.02 |
| ZNF160 | 0.27 | 0.02 |
| PRODH | -1.30 | 0.02 |
| SEC61G | 0.15 | 0.02 |
| CCDC80 | -1.56 | 0.02 |
| NFAT5 | 0.25 | 0.02 |

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|-------------|-------|------|
| VSNL1 | 0.36 | 0.02 |
| CETN3 | 0.21 | 0.02 |
| B4GALNT4 | -0.16 | 0.02 |
| RNF169 | 0.38 | 0.02 |
| AL133230.1 | 3.75 | 0.02 |
| ANXA6 | 0.16 | 0.02 |
| APAF1 | 0.25 | 0.02 |
| FOXO3 | 0.18 | 0.02 |
| IGSF9 | -0.18 | 0.02 |
| CASP9 | -0.32 | 0.02 |
| C8orf33 | -0.15 | 0.02 |
| ELK4 | 0.17 | 0.02 |
| ZSCAN2 | 0.36 | 0.02 |
| ALG10B | -0.42 | 0.02 |
| LINC00326 | 1.28 | 0.02 |
| MIB2 | -0.14 | 0.03 |
| PTGFRN | 0.16 | 0.03 |
| MGAT5 | 0.18 | 0.03 |
| AC025259.3 | -0.40 | 0.03 |
| TNFRSF21 | 0.16 | 0.03 |
| TGFBI | -4.32 | 0.03 |
| ZBED2 | -0.19 | 0.03 |
| RWDD3 | -0.67 | 0.03 |
| NR5A1 | 1.53 | 0.03 |
| PIM1 | 0.25 | 0.03 |
| SNORA80D | -3.19 | 0.03 |
| VAT1 | 0.12 | 0.03 |
| WFDC3 | 1.23 | 0.03 |
| CMTM6 | 0.14 | 0.03 |
| AL591846.1 | -0.97 | 0.03 |
| APP | 0.11 | 0.03 |
| NECTIN3-AS1 | -2.36 | 0.03 |
| RDH10 | -0.20 | 0.03 |
| AL603832.3 | -4.22 | 0.03 |
| FAM161A | 0.31 | 0.03 |
| CALU | 0.13 | 0.03 |
| CASC10 | -0.35 | 0.03 |
| FAM157C | 1.13 | 0.03 |
| AC106886.5 | -0.93 | 0.03 |
| CERS6-AS1 | 3.67 | 0.03 |
| INSR | 0.24 | 0.03 |
| VPS9D1-AS1 | -0.25 | 0.03 |
| C9orf78 | -0.15 | 0.03 |
| SNTB1 | 0.51 | 0.03 |

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|------------|-------|------|
| HSD3B7 | -0.47 | 0.03 |
| HERC2P2 | 0.17 | 0.03 |
| KCNAB2 | -0.22 | 0.03 |
| CAV1 | -0.10 | 0.03 |
| RFNG | -0.15 | 0.03 |
| DNAJA1 | -0.10 | 0.03 |
| IRAK2 | 0.40 | 0.03 |
| NFATC2 | 0.49 | 0.03 |
| PLK1 | -0.14 | 0.03 |
| AL136038.4 | -2.15 | 0.03 |
| NMI | -0.32 | 0.03 |
| BOLA2B | 2.79 | 0.03 |
| CYHR1 | -0.16 | 0.03 |
| SNX12 | 0.19 | 0.03 |
| PMS2P7 | -3.63 | 0.03 |
| COL9A2 | -0.49 | 0.03 |
| EMC9 | -0.23 | 0.03 |
| SEC14L1 | 0.16 | 0.03 |
| WDHD1 | 0.18 | 0.03 |
| LUCAT1 | 0.52 | 0.03 |
| BCAT2 | -0.18 | 0.03 |
| HACD1 | 0.30 | 0.03 |
| ERAS | -2.49 | 0.03 |
| KLF13 | 0.14 | 0.03 |
| ACSL3 | 0.11 | 0.03 |
| AC006059.1 | 4.13 | 0.03 |
| STXBP1 | 0.19 | 0.03 |
| ITPR3 | 0.14 | 0.03 |
| SRSF2 | -0.10 | 0.03 |
| CYFIP2 | -0.15 | 0.03 |
| SNN | -0.20 | 0.03 |
| EFL1 | 0.26 | 0.03 |
| POLA2 | -0.37 | 0.03 |
| ATP6V1FNB | -0.77 | 0.03 |
| SNRPF4 | 3.66 | 0.03 |
| LGALS3BP | -0.11 | 0.03 |
| KLC3 | 0.26 | 0.03 |
| IER5 | -0.14 | 0.03 |
| TCF20 | 0.16 | 0.03 |
| SYNE2 | 0.18 | 0.03 |
| ZNF774 | -0.62 | 0.03 |
| ATP5IF1 | -0.15 | 0.03 |
| AC055811.4 | 0.93 | 0.03 |
| PURPL | -1.00 | 0.03 |

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|------------|-------|------|
| SUN3 | -0.63 | 0.03 |
| BX255925.3 | -0.17 | 0.03 |
| OR7E11P | 3.56 | 0.03 |
| CNOT6L | 0.22 | 0.03 |
| MAN1B1-DT | -0.74 | 0.03 |
| KLF10 | 0.12 | 0.03 |
| AHRR | -0.30 | 0.03 |
| RUSC1 | -0.13 | 0.03 |
| HNRNPA1 | 0.09 | 0.03 |
| AC083880.1 | -1.00 | 0.03 |
| CABLES2 | -0.26 | 0.03 |
| ALG1L | -1.80 | 0.03 |
| AP000808.2 | -1.54 | 0.03 |
| CNTROB | 0.16 | 0.03 |
| PAQR5 | 0.22 | 0.03 |
| TMED2 | 0.10 | 0.03 |
| AL391261.2 | -4.06 | 0.03 |
| ROCK2 | 0.14 | 0.03 |
| UPK3B | -0.54 | 0.03 |
| UPK1A | 0.90 | 0.03 |
| MICAL3 | 0.42 | 0.03 |
| PSKH1 | 0.25 | 0.03 |
| STT3B | 0.11 | 0.03 |
| CHST15 | 0.18 | 0.03 |
| UFM1 | -0.17 | 0.03 |
| TJAP1 | -0.16 | 0.03 |
| DCAF10 | 0.22 | 0.03 |
| TXNDC12 | 0.33 | 0.03 |
| CCNG1 | -0.13 | 0.03 |
| THSD4 | 0.31 | 0.03 |
| AC108134.1 | 1.00 | 0.03 |
| DGKA | -0.20 | 0.03 |
| RYR3 | -0.73 | 0.03 |
| COX15 | -0.14 | 0.03 |
| ATP1A1 | 0.10 | 0.03 |
| RBM4 | -0.28 | 0.03 |
| MPRIP | 0.10 | 0.03 |
| ZBTB10 | 0.22 | 0.03 |
| AL355472.1 | -0.98 | 0.03 |
| PADI2 | 0.53 | 0.03 |
| COL12A1 | -0.19 | 0.03 |
| CCIN | -2.76 | 0.03 |
| TIGIT | 4.13 | 0.03 |
| MINDY2 | 0.19 | 0.03 |

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|------------|-------|------|
| MTCO1P12 | -0.16 | 0.04 |
| GLG1 | 0.09 | 0.04 |
| SPRED2 | 0.14 | 0.04 |
| MCL1 | 0.10 | 0.04 |
| LDHA | 0.13 | 0.04 |
| TPRN | -0.20 | 0.04 |
| FTX | -0.27 | 0.04 |
| CALCOCO1 | 0.23 | 0.04 |
| RPS24P8 | -0.97 | 0.04 |
| AC092127.1 | -3.62 | 0.04 |
| MAFK | 0.19 | 0.04 |
| TLCD1 | -0.27 | 0.04 |
| VSIG1 | -3.03 | 0.04 |
| SURF1 | -0.16 | 0.04 |
| ERN2 | -1.11 | 0.04 |
| SCMH1 | 0.26 | 0.04 |
| TCIRG1 | -0.17 | 0.04 |
| NOP16 | -0.14 | 0.04 |
| AC017100.1 | -1.19 | 0.04 |
| RREB1 | 0.19 | 0.04 |
| MED30 | 0.23 | 0.04 |
| DEK | 0.11 | 0.04 |
| LAMC2 | 0.23 | 0.04 |
| KRT8 | -0.10 | 0.04 |
| RPL41P2 | -4.06 | 0.04 |
| MDP1 | 3.99 | 0.04 |
| MCCD1P2 | 3.99 | 0.04 |
| SYDE1 | -0.39 | 0.04 |
| LSG1 | -0.14 | 0.04 |
| FEM1C | 0.19 | 0.04 |
| ORMDL3 | 0.17 | 0.04 |
| RAD21L1 | -3.52 | 0.04 |
| PALD1 | 0.17 | 0.04 |
| TBC1D14 | 0.26 | 0.04 |
| NPIPA2 | 1.64 | 0.04 |
| AKAP12 | 0.27 | 0.04 |
| ZNFX1 | -0.18 | 0.04 |
| ISCU | -0.14 | 0.04 |
| PPIAP51 | 3.55 | 0.04 |
| NOD1 | -0.44 | 0.04 |
| SSR2 | 0.12 | 0.04 |
| FAM187B2P | 3.55 | 0.04 |
| MAP1LC3A | -3.03 | 0.04 |
| TRIOBP | 0.12 | 0.04 |

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|------------|-------|------|
| KIAA0319L | 0.18 | 0.04 |
| TMC5 | -0.30 | 0.04 |
| AC106827.1 | 4.01 | 0.04 |
| PJA2 | 0.16 | 0.04 |
| MDGA1 | 0.49 | 0.04 |
| SPHK2 | -0.28 | 0.04 |
| SCX | -0.34 | 0.04 |
| PKM | 0.09 | 0.04 |
| AC068587.2 | -3.51 | 0.04 |
| SH3BP4 | 0.18 | 0.04 |
| FLT3 | 1.59 | 0.04 |
| TCTEX1D4 | -1.98 | 0.04 |
| ADCY9 | 0.32 | 0.04 |
| KREMEN2 | -0.29 | 0.04 |
| MRPL41 | -0.16 | 0.04 |
| RNMT | 0.17 | 0.04 |
| PSMA2 | -0.42 | 0.04 |
| SPIN4 | -0.28 | 0.04 |
| SNHG19 | -0.18 | 0.04 |
| ITPR1 | 0.39 | 0.04 |
| SPAG9 | 0.13 | 0.04 |
| TRMU | -0.13 | 0.04 |
| PRTN3 | 0.58 | 0.04 |
| MED24 | -0.12 | 0.04 |
| AC092828.1 | 1.92 | 0.04 |
| ALDOA | 0.30 | 0.04 |
| ACTN4 | 0.11 | 0.04 |
| RABIF | -0.28 | 0.04 |
| NUDT1 | -0.19 | 0.04 |
| ARFGEF3 | 0.30 | 0.04 |
| MEF2A | 0.22 | 0.04 |
| RRAGD | 0.21 | 0.04 |
| SLCO4A1 | 0.11 | 0.04 |
| KLF11 | 0.38 | 0.04 |
| AL121845.4 | -3.02 | 0.04 |
| ARHGAP35 | 0.13 | 0.04 |
| AKNA | 0.25 | 0.04 |
| HSPE1 | -0.14 | 0.04 |
| NPC2 | 0.13 | 0.04 |
| PPIF | -0.12 | 0.04 |
| AL354726.1 | 3.98 | 0.04 |
| FGFR1OP | -0.26 | 0.04 |
| MGAT5B | 0.42 | 0.04 |
| ZNF827 | -0.22 | 0.04 |

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|------------|-------|------|
| ZBED5 | -0.18 | 0.04 |
| FSTL1 | -0.25 | 0.04 |
| PRDM1 | 0.35 | 0.04 |
| CDC20B | 3.44 | 0.04 |
| POLR1C | -0.15 | 0.04 |
| MRPL50 | -0.18 | 0.04 |
| TMED3 | 0.15 | 0.04 |
| PIIB | 0.11 | 0.04 |
| LTA4H | 0.11 | 0.04 |
| CCDC149 | 0.41 | 0.04 |
| OLFML3 | -1.58 | 0.04 |
| GSTK1 | -0.15 | 0.04 |
| RALGPS2 | 0.23 | 0.04 |
| ARSB | 0.33 | 0.04 |
| NBR1 | 0.16 | 0.04 |
| ERCC1 | 0.18 | 0.04 |
| AKAP13 | 0.19 | 0.04 |
| AC004233.2 | -0.84 | 0.04 |
| FAM136A | -0.11 | 0.04 |
| RTCA | -0.16 | 0.04 |
| SMARCC1 | 0.11 | 0.04 |
| SLC39A7 | 0.10 | 0.04 |
| SMARCC2 | 0.14 | 0.04 |
| TFPI | 0.23 | 0.04 |
| GAPDH | 0.09 | 0.04 |
| CGNL1 | 0.38 | 0.04 |
| ROMO1 | -0.19 | 0.04 |
| RNF208 | -0.24 | 0.04 |
| ARHGEF11 | 0.17 | 0.04 |
| CYP2S1 | -0.20 | 0.04 |
| SLU7 | 0.16 | 0.04 |
| DNMBP | 0.13 | 0.04 |
| LINC00659 | 0.63 | 0.04 |
| STK39 | 0.13 | 0.04 |
| EXT1 | 0.23 | 0.04 |
| AL513327.1 | 0.53 | 0.04 |
| ADCK2 | 0.23 | 0.04 |
| TMEM238 | -0.36 | 0.04 |
| CDC42BPG | -0.15 | 0.04 |
| IGF2BP3 | 0.22 | 0.04 |
| BBX | 0.15 | 0.04 |
| SLC38A9 | 0.29 | 0.04 |
| FOXP2 | 0.94 | 0.04 |
| NECTIN3 | 0.14 | 0.05 |

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|-------------|-------|------|
| RPL10P9 | 0.30 | 0.05 |
| GNL2 | 0.13 | 0.05 |
| PTMA | 0.08 | 0.05 |
| PYURF | -0.15 | 0.05 |
| CHCHD7 | -0.25 | 0.05 |
| SLC35C1 | -0.18 | 0.05 |
| DIMT1 | -0.15 | 0.05 |
| IQANK1 | -0.14 | 0.05 |
| CDC42EP3 | 0.18 | 0.05 |
| TMEM147-AS1 | -0.25 | 0.05 |
| HCAR2 | -1.86 | 0.05 |
| STT3A | 0.12 | 0.05 |
| LIF | 0.18 | 0.05 |
| STAG3L3 | 0.59 | 0.05 |
| AC022532.1 | 1.55 | 0.05 |
| EIF4B | 0.08 | 0.05 |
| MYO9A | 0.32 | 0.05 |
| SERINC1 | 0.14 | 0.05 |
| SMAD7 | -0.23 | 0.05 |
| AC006333.2 | -0.53 | 0.05 |
| GCLC | 0.14 | 0.05 |
| KIF13A | 0.20 | 0.05 |
| RUNDC3B | 0.47 | 0.05 |
| TICRR | 0.17 | 0.05 |
| RAD51C | -0.13 | 0.05 |
| RRM2B | -0.14 | 0.05 |
| INSIG2 | 0.22 | 0.05 |
| AC023509.3 | 0.68 | 0.05 |
| HNF4A | 0.31 | 0.05 |
| FAM210B | -0.20 | 0.05 |
| ZBTB7A | 0.17 | 0.05 |
| TRAM1 | 0.10 | 0.05 |
| CDC42BPA | 0.14 | 0.05 |
| SMC4 | 0.15 | 0.05 |
| HOXB3 | 0.27 | 0.05 |
| TTC23L | -2.11 | 0.05 |
| EFNA2 | 0.41 | 0.05 |
| RAB11FIP5 | 0.17 | 0.05 |
| AC002044.2 | -3.89 | 0.05 |
| AC022167.5 | -3.89 | 0.05 |
| CCNC | -0.14 | 0.05 |
| SRA1 | -0.15 | 0.05 |
| MXRA7 | 0.15 | 0.05 |
| NAB2 | 0.13 | 0.05 |

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|------------|-------|------|
| AC009812.1 | -1.37 | 0.05 |
| RGS9BP | 1.14 | 0.05 |
| GMPR | 0.24 | 0.05 |
| AC022080.1 | -3.89 | 0.05 |
| HRH4 | -3.89 | 0.05 |
| DNAI1 | -1.12 | 0.05 |
| AC010864.1 | -1.34 | 0.05 |
| LEMD2 | 0.19 | 0.05 |
| AC084357.2 | -1.97 | 0.05 |
| QRICH2 | -0.25 | 0.05 |
| TPI1 | 0.10 | 0.05 |
| SPSB2 | -0.33 | 0.05 |
| NOL3 | -0.17 | 0.05 |
| TMEM123 | 0.10 | 0.05 |
| AC083873.1 | -3.89 | 0.05 |
| ANKS1B | -2.94 | 0.05 |
| PRNP | 0.12 | 0.05 |
| TRAPPC6B | 0.58 | 0.05 |
| RPL13P12 | 0.14 | 0.05 |
| GPR17 | -2.55 | 0.05 |
| GRK6 | 0.13 | 0.05 |
| NCR3LG1 | 1.64 | 0.05 |
| LIFR | 0.30 | 0.05 |
| AC024060.1 | -0.59 | 0.05 |
| RCHY1 | -0.19 | 0.05 |

Table S4 The RNA-sequencing results of HCT116 cells with PEX5 knockout after IR

| Gene | log2(fold change) | P |
|------------|-------------------|------|
| BOLA2B | -4.95 | 0.00 |
| IGF2BP3 | 3.59 | 0.00 |
| EIF3C | 3.56 | 0.00 |
| AC016739.1 | -2.81 | 0.00 |
| PKD1P6 | 4.99 | 0.00 |
| ZNF384 | 2.89 | 0.00 |
| CRYBG3 | 3.73 | 0.00 |
| AC097534.1 | 7.06 | 0.00 |
| CCNK | 3.84 | 0.00 |
| DLG5 | 2.53 | 0.00 |
| AL161729.3 | -4.93 | 0.00 |
| AC114271.1 | -4.14 | 0.00 |
| MT2A | -2.35 | 0.00 |
| AL031118.1 | 6.79 | 0.00 |
| SMIM11A | -2.53 | 0.00 |
| CAP1 | 2.52 | 0.00 |
| ORM2 | 6.83 | 0.00 |
| TCEA1P2 | 3.14 | 0.00 |
| ZC3H11B | 5.87 | 0.01 |
| AC138392.1 | 2.79 | 0.01 |
| ARHGAP5 | 2.52 | 0.01 |
| RELL1 | 2.89 | 0.01 |
| ZNF658B | 4.87 | 0.01 |
| HLA-DPA1 | 4.22 | 0.01 |
| CSNK2A3 | 2.70 | 0.01 |
| FRRS1 | 2.55 | 0.01 |
| HSP90AA2P | 2.55 | 0.01 |
| ZNHIT1 | -2.28 | 0.01 |
| RPS15 | -1.83 | 0.01 |
| AC087588.2 | 6.47 | 0.01 |
| ARL2BP | 6.81 | 0.01 |
| RPS28P7 | -1.82 | 0.01 |
| MT1E | -1.78 | 0.01 |
| NEMF | 2.22 | 0.01 |
| ZGLP1 | -2.92 | 0.01 |
| AC079949.1 | 5.46 | 0.01 |
| HBE1 | 6.27 | 0.01 |
| FAM3C2 | 2.33 | 0.01 |
| MIR196A1 | 5.41 | 0.01 |

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|------------|-------|------|
| SMC4 | 2.16 | 0.01 |
| CHCHD5 | -2.20 | 0.01 |
| LAMTOR2 | -1.89 | 0.01 |
| HBA2 | -6.27 | 0.01 |
| MT2P1 | -2.41 | 0.01 |
| RAVER1 | 3.10 | 0.01 |
| MRPL23 | -2.91 | 0.01 |
| MALL | 1.93 | 0.01 |
| MT1X | -1.71 | 0.01 |
| RPL24P2 | -3.55 | 0.01 |
| TBC1D14 | 1.97 | 0.01 |
| NDUFS8 | -1.79 | 0.01 |
| ATP5F1D | -2.55 | 0.01 |
| AP3B2 | 6.07 | 0.01 |
| TSTD2 | 2.52 | 0.01 |
| S100A4 | -1.86 | 0.01 |
| RNU6-1206P | 6.52 | 0.01 |
| PRPF31 | -2.00 | 0.01 |
| PEX5 | -1.75 | 0.01 |
| ENTPD1-AS1 | 2.31 | 0.02 |
| RPS28 | -1.96 | 0.02 |
| SPTLC1P1 | 5.43 | 0.02 |
| AL157392.4 | -6.29 | 0.02 |
| ABHD12B | 4.39 | 0.02 |
| CAVIN4 | 3.03 | 0.02 |
| ETFB | -2.09 | 0.02 |
| KISS1 | -4.76 | 0.02 |
| USP34 | 1.81 | 0.02 |
| NRIP1 | 1.82 | 0.02 |
| SDHAF2 | -1.94 | 0.02 |
| LSM12P1 | 1.97 | 0.02 |
| EIF4EP2 | 2.16 | 0.02 |
| LAMTOR4 | -2.08 | 0.02 |
| APOL1 | 6.04 | 0.02 |
| HMGN1P38 | 2.52 | 0.02 |
| RPL18 | -1.99 | 0.02 |
| POLA2 | -1.96 | 0.02 |
| HRAS | -2.01 | 0.02 |
| GUSBP5 | 6.37 | 0.02 |
| BABAM1 | -1.71 | 0.02 |
| NENF | -1.67 | 0.02 |

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|------------|-------|------|
| PMM2 | 1.99 | 0.02 |
| RPS19 | -1.81 | 0.02 |
| NDUFB7 | -2.20 | 0.02 |
| AC112184.1 | -2.99 | 0.02 |
| CEP295 | 2.00 | 0.02 |
| ZNF770 | 1.77 | 0.02 |
| RPL13 | -1.97 | 0.02 |
| AL356512.1 | 5.98 | 0.02 |
| NOMO2 | 1.84 | 0.02 |
| HMG20A | 1.93 | 0.02 |
| TIMP1 | -1.60 | 0.02 |
| MRPL41 | -2.02 | 0.02 |
| SHPRH | 2.90 | 0.02 |
| AC018665.1 | 6.28 | 0.02 |
| TMEM86B | -2.14 | 0.02 |
| ZNF595 | 2.24 | 0.02 |
| METTL26 | -2.02 | 0.02 |
| AC006111.2 | -2.15 | 0.02 |
| RPL36 | -2.04 | 0.02 |
| ANKRD18EP | 3.34 | 0.02 |
| AC124283.3 | 5.86 | 0.02 |
| RPL29 | -1.65 | 0.02 |
| GSTP1 | -1.90 | 0.02 |
| NPW | -2.45 | 0.02 |
| STK24 | 1.68 | 0.02 |
| TBCE | 2.02 | 0.02 |
| ATP5MC1 | -1.76 | 0.02 |
| AP001324.1 | -1.77 | 0.02 |
| CYP2C8 | -5.98 | 0.02 |
| EXOSC4 | -2.08 | 0.02 |
| CYB561D2 | -6.34 | 0.02 |
| AC007382.1 | 4.14 | 0.02 |
| AL355499.1 | 6.02 | 0.02 |
| ZRANB2-AS2 | 6.02 | 0.02 |
| MT1F | -1.81 | 0.02 |
| AP001000.1 | 2.41 | 0.02 |
| LRRK2 | 5.93 | 0.03 |
| AC137932.1 | -2.33 | 0.03 |
| PSMG3 | -1.84 | 0.03 |
| ELOB | -1.76 | 0.03 |
| RNF31 | 2.15 | 0.03 |

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|------------|-------|------|
| RPL13P12 | -2.08 | 0.03 |
| AC130650.2 | 5.02 | 0.03 |
| UQCC3 | -2.25 | 0.03 |
| FUOM | -2.15 | 0.03 |
| CST3 | -1.81 | 0.03 |
| CEP112 | 2.01 | 0.03 |
| CUL3 | 1.71 | 0.03 |
| SLC43A3 | -1.72 | 0.03 |
| MRPL27 | -1.55 | 0.03 |
| NRTN | -2.44 | 0.03 |
| AC022211.4 | -2.79 | 0.03 |
| AL021707.6 | -2.22 | 0.03 |
| MZT2B | -2.40 | 0.03 |
| TM4SF18 | 5.86 | 0.03 |
| HAUS6P1 | 5.86 | 0.03 |
| CHD4 | -1.64 | 0.03 |
| IPPK | 2.47 | 0.03 |
| YBX1P1 | 1.88 | 0.03 |
| NAA10 | -1.97 | 0.03 |
| RAPH1 | 3.12 | 0.03 |
| MGMT | -1.99 | 0.03 |
| RPL10P13 | -1.91 | 0.03 |
| VPREB3 | -2.94 | 0.03 |
| S100A13 | -1.56 | 0.03 |
| RPS19BP1 | -2.11 | 0.03 |
| CHCHD10 | -1.68 | 0.03 |
| TMEM219 | -1.77 | 0.03 |
| PAFAH1B3 | -1.53 | 0.03 |
| AC240274.1 | 1.87 | 0.03 |
| SNORD15B | -4.36 | 0.03 |
| MED18 | -1.65 | 0.03 |
| COMMD7 | -1.60 | 0.03 |
| HIST2H2AC | -2.02 | 0.03 |
| GADD45GIP1 | -1.96 | 0.03 |
| SELENOM | -2.17 | 0.03 |
| AP2S1 | -1.80 | 0.03 |
| COMTD1 | -2.17 | 0.03 |
| DPM3 | -1.98 | 0.03 |
| AL591135.1 | 4.19 | 0.03 |
| EBP | -1.58 | 0.03 |
| PAXX | -2.16 | 0.03 |

| | | |
|-------------|-------|------|
| FMNL2 | 1.57 | 0.03 |
| FBXL15 | -2.34 | 0.03 |
| CFD | -2.01 | 0.03 |
| HPS3 | 1.73 | 0.03 |
| DHRS4L2 | -1.55 | 0.03 |
| NTHL1 | -2.04 | 0.03 |
| TIMM13 | -1.85 | 0.03 |
| AHCTF1P1 | 3.01 | 0.03 |
| TTPA | 2.21 | 0.03 |
| GEMIN7 | -1.49 | 0.03 |
| MRPL55 | -1.73 | 0.03 |
| C19orf24 | -2.03 | 0.03 |
| UBE2V1P2 | 2.94 | 0.03 |
| RPLP2 | -1.54 | 0.03 |
| LRRC7 | 4.16 | 0.03 |
| AC025917.1 | 5.81 | 0.04 |
| SERBP1P5 | 1.75 | 0.04 |
| ATOX1 | -1.72 | 0.04 |
| ISG15 | -1.91 | 0.04 |
| AC068888.2 | 4.14 | 0.04 |
| AC239803.3 | -3.28 | 0.04 |
| KRT6A | 1.60 | 0.04 |
| RPL26P6 | 6.04 | 0.04 |
| BX284668.2 | 3.98 | 0.04 |
| DAGLA | 2.86 | 0.04 |
| AL158152.2 | -3.89 | 0.04 |
| ITGB1 | 1.57 | 0.04 |
| SMAD1 | 1.78 | 0.04 |
| AC127502.1 | 3.00 | 0.04 |
| LINC01290 | 5.67 | 0.04 |
| MGAT2 | 6.00 | 0.04 |
| SLC16A8 | 6.00 | 0.04 |
| DPM2 | -1.64 | 0.04 |
| KATNBL1P6 | 2.77 | 0.04 |
| ANAPC11 | -1.62 | 0.04 |
| AC015912.3 | -2.25 | 0.04 |
| AC011825.2 | 5.71 | 0.04 |
| RBP5 | 4.75 | 0.04 |
| RAD9B | -5.71 | 0.04 |
| EPO | -5.71 | 0.04 |
| ST8SIA6-AS1 | -5.71 | 0.04 |

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|------------|-------|------|
| COMMD4 | -1.77 | 0.04 |
| FAAP20 | -1.93 | 0.04 |
| EIF3K | -1.42 | 0.04 |
| CYP4F25P | -3.20 | 0.04 |
| LINC02482 | -2.88 | 0.04 |
| NPM3 | -1.71 | 0.04 |
| WFDC3 | -2.28 | 0.04 |
| MTLN | -1.76 | 0.04 |
| AC012442.2 | -3.85 | 0.04 |
| AC007040.2 | -2.96 | 0.04 |
| ANKRD20A4 | 3.62 | 0.04 |
| FAM91A3P | 4.91 | 0.04 |
| MSL3P1 | 4.72 | 0.04 |
| PRSS3 | -1.55 | 0.04 |
| CRYBB1 | 5.97 | 0.04 |
| AC105402.3 | 5.74 | 0.04 |
| AC112484.3 | -2.11 | 0.04 |
| AC010280.2 | 4.88 | 0.04 |
| MRPL14 | -1.64 | 0.04 |
| DENND1C | 2.10 | 0.04 |
| SEC24C | 2.09 | 0.04 |
| AURKAIP1 | -2.17 | 0.04 |
| SLC18A2 | 4.74 | 0.04 |
| PLAC8L1 | -1.76 | 0.04 |
| LRRC8E | 4.02 | 0.04 |
| ART5 | -2.09 | 0.04 |
| AC079250.1 | -2.75 | 0.04 |
| RPL18A | -1.67 | 0.04 |
| PEMT | -1.56 | 0.04 |
| XPC | 1.55 | 0.04 |
| POLR2I | -1.61 | 0.04 |
| SNHG11 | -1.67 | 0.04 |
| DCTPP1 | -1.42 | 0.04 |
| MMAB | -1.75 | 0.04 |
| NUDT2 | -1.40 | 0.04 |
| NUDT1 | -1.63 | 0.04 |
| PPP2R5D | 1.67 | 0.04 |
| TMC3 | 5.56 | 0.04 |
| AC011773.3 | -5.63 | 0.04 |
| PRSS53 | 2.47 | 0.04 |
| TALDO1 | -1.38 | 0.04 |

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|------------|-------|------|
| AC011199.1 | 5.91 | 0.04 |
| AP001180.1 | 5.91 | 0.04 |
| VPS28 | -1.71 | 0.05 |
| ARL4AP5 | 5.53 | 0.05 |
| NDUFB11 | -1.44 | 0.05 |
| BRMS1 | -1.82 | 0.05 |
| RANGRF | -1.82 | 0.05 |
| ESF1 | 1.58 | 0.05 |
| RF00404 | 3.91 | 0.05 |
| NT5C | -2.05 | 0.05 |
| SAC3D1 | -2.08 | 0.05 |
| TPGS1 | -2.19 | 0.05 |
| CTRC | 5.66 | 0.05 |
| TPTE2P6 | 5.66 | 0.05 |
| AL132780.5 | 3.51 | 0.05 |
| RF00019 | -3.41 | 0.05 |
| MRPL54 | -1.84 | 0.05 |
| CAPN6 | 2.46 | 0.05 |
| DAP3P2 | 4.76 | 0.05 |
| AC099850.3 | 1.70 | 0.05 |
| AL161772.1 | 5.50 | 0.05 |
| TMEM160 | -2.54 | 0.05 |
| GAMT | -1.92 | 0.05 |
| AC092134.1 | -4.74 | 0.05 |
| CAVIN3 | -1.94 | 0.05 |
| TMED3 | -1.53 | 0.05 |
| AC092070.2 | 2.75 | 0.05 |
| CENPM | -1.86 | 0.05 |
| C9orf139 | -2.31 | 0.05 |
| AC114489.1 | 5.48 | 0.05 |
| DCXR | -1.56 | 0.05 |
| MRPL11 | -1.43 | 0.05 |
| PTPN13 | 1.58 | 0.05 |
| IQGAP2 | 2.66 | 0.05 |
| AL139805.1 | 5.52 | 0.05 |
| AC005776.1 | 5.52 | 0.05 |
| ITGA2 | 1.42 | 0.05 |
| NOSIP | -1.77 | 0.05 |

Table S5 Results of mass spectrometry analysis

| Gene names | Protein names | Protein score |
|------------|---|---------------|
| | Cleavage and polyadenylation specificity factor | |
| CPSF1 | subunit 1 | 1623 |
| WDR33 | pre-mRNA 3' end processing protein WDR33 | 1027 |
| | Cleavage and polyadenylation specificity factor | |
| CPSF2 | subunit 2 | 758 |
| TFG | Protein TFG | 649 |
| THRAP3 | Thyroid hormone receptor-associated protein 3 | 642 |
| | Cleavage and polyadenylation specificity factor | |
| CPSF3 | subunit 3 | 521 |
| FIP1L1 | Pre-mRNA 3'-end-processing factor FIP1 | 453 |
| PEX5 | Peroxisomal targeting signal 1 receptor | 434 |
| PEX14 | Peroxisomal membrane protein PEX14 | 417 |
| PABPC1 | Polyadenylate-binding protein 1 | 349 |
| HNRNPA1 | Heterogeneous nuclear ribonucleoprotein A1 | 331 |
| SQSTM1 | Sequestosome-1 | 329 |
| BCLAF1 | Bcl-2-associated transcription factor 1 | 289 |
| TUBA1A | Tubulin alpha-1A chain | 272 |
| POLDIP3 | Polymerase delta-interacting protein 3 | 259 |
| TUBG1 | Tubulin gamma-1 chain | 234 |
| SORD | Sorbitol dehydrogenase | 225 |
| HSPA8 | Heat shock cognate 71 kDa protein | 219 |
| TUBGCP2 | Gamma-tubulin complex component 2 | 217 |
| MRPS22 | 28S ribosomal protein S22, mitochondrial | 210 |
| HNRNPC | Heterogeneous nuclear ribonucleoproteins C1/C2 | 203 |
| GYS1 | Glycogen [starch] synthase, muscle | 198 |
| PARP1 | Poly [ADP-ribose] polymerase 1 | 188 |
| TUBGCP3 | Gamma-tubulin complex component 3 | 188 |
| NIPA1 | Magnesium transporter NIPA1 | 179 |
| FAM83D | Protein FAM83D | 169 |
| DDX5 | Probable ATP-dependent RNA helicase DDX5 | 158 |
| ERLIN1 | Erlin-1 | 155 |
| DDX3X | ATP-dependent RNA helicase DDX3X | 151 |
| | Cleavage and polyadenylation specificity factor | |
| CPSF4 | subunit 4 | 151 |
| DHX9 | ATP-dependent RNA helicase A | 141 |
| HNRNPH1 | Heterogeneous nuclear ribonucleoprotein H | 136 |
| HSPA5 | Endoplasmic reticulum chaperone BiP | 127 |
| | Serine/threonine-protein phosphatase PGAM5, | |
| PGAM5 | mitochondrial | 126 |

| | | |
|---------|---|-----|
| EIF4A3 | Eukaryotic initiation factor 4A-III | 124 |
| TAF15 | TATA-binding protein-associated factor 2N | 124 |
| RPL17 | 60S ribosomal protein L17 | 120 |
| IGHG1 | Immunoglobulin heavy constant gamma 1 | 111 |
| RPL11 | 60S ribosomal protein L11 | 110 |
| | Fragile X mental retardation syndrome-related | |
| FXR1 | protein 1 | 110 |
| ILF2 | Interleukin enhancer-binding factor 2 | 109 |
| RPS8 | 40S ribosomal protein S8 | 109 |
| WTAP | Pre-mRNA-splicing regulator WTAP | 108 |
| HMMR | Hyaluronan mediated motility receptor | 107 |
| HNRNPK | Heterogeneous nuclear ribonucleoprotein K | 105 |
| YBX1 | Y-box-binding protein 1 | 104 |
| RPS11 | 40S ribosomal protein S11 | 101 |
| PABPC4 | Polyadenylate-binding protein 4 | 101 |
| HNRNPR | Heterogeneous nuclear ribonucleoprotein R | 98 |
| MRPS34 | 28S ribosomal protein S34, mitochondrial | 98 |
| RPL10 | 60S ribosomal protein L10 | 95 |
| PTBP1 | Polypyrimidine tract-binding protein 1 | 91 |
| NCL | Nucleolin | 90 |
| HNRNPA3 | Heterogeneous nuclear ribonucleoprotein A3 | 88 |
| RPS20 | 40S ribosomal protein S20 | 86 |
| XRCC6 | X-ray repair cross-complementing protein 6 | 86 |
| CAVIN1 | Caveolae-associated protein 1 | 85 |
| SLC25A5 | ADP/ATP translocase 2 | 84 |
| TUBB | Tubulin beta chain | 83 |
| RPL13 | 60S ribosomal protein L13 | 81 |
