**Supplementary Table 5. Differentially expressed genes between *Arid1a* mutant and WT HCC samples (TCGA database, Firehose).**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene** | **Cytoband** | **μ in altered group** | **μ in unaltered group** | **σ in altered group** | **σ in unaltered group** | **Log ratio** | ***p*** | ***q*** | **Higher expression in** |
| MYC | 8q24.21 | 11.08 | 9.68 | 1.25 | 1.62 | 1.4 | 9.28E-08 | 1.33E-04 | Altered group |
| GPX2 | 14q23.3 | 13.76 | 11.83 | 1.85 | 2.87 | 1.94 | 5.18E-07 | 4.13E-04 | Altered group |
| RAB15 | 14q23.3 | 9.77 | 9.04 | 0.7 | 1 | 0.72 | 5.72E-07 | 4.25E-04 | Altered group |
| SERPINA1 | 14q32.13 | 19.51 | 18.66 | 0.82 | 1.41 | 0.85 | 1.05E-06 | 6.92E-04 | Altered group |
| SLC35D2 | 9q22.32 | 10.9 | 10.42 | 0.56 | 0.67 | 0.48 | 1.07E-05 | 3.47E-03 | Altered group |
| MRPL44 | 2q36.1 | 10.04 | 9.77 | 0.32 | 0.44 | 0.27 | 1.81E-05 | 5.18E-03 | Altered group |
| PABPC1 | 8q22.3 | 14.95 | 14.28 | 0.8 | 0.93 | 0.67 | 2.06E-05 | 5.60E-03 | Altered group |
| AKR1C1 | 10p15.1 | 14.78 | 13.6 | 1.43 | 1.88 | 1.18 | 2.97E-05 | 7.28E-03 | Altered group |
| NIFK | 2q14.3 | 9.72 | 9.37 | 0.43 | 0.56 | 0.35 | 3.48E-05 | 8.22E-03 | Altered group |
| ANP32B | 9q22.33 | 11.6 | 11.2 | 0.49 | 0.63 | 0.4 | 3.97E-05 | 8.92E-03 | Altered group |
| SLC7A9 | 19q13.11 | 9.25 | 8.41 | 0.98 | 1.81 | 0.83 | 3.98E-05 | 8.92E-03 | Altered group |
| TIMM9 | 14q23.1 | 9.39 | 9.04 | 0.45 | 0.56 | 0.35 | 6.53E-05 | 0.0118 | Altered group |
| C1ORF226 | 1q23.3 | 9.36 | 8.88 | 0.58 | 1.13 | 0.48 | 6.63E-05 | 0.0118 | Altered group |
| FGFR4 | 5q35.2 | 12.68 | 12.03 | 0.79 | 1.5 | 0.65 | 6.71E-05 | 0.0118 | Altered group |
| UBE2R2 | 9p13.3 | 11.28 | 11.05 | 0.3 | 0.38 | 0.23 | 6.98E-05 | 0.0119 | Altered group |
| LCN2 | 9q34.11 | 11.39 | 9.19 | 2.86 | 3.48 | 2.2 | 7.48E-05 | 0.012 | Altered group |
| RELN | 7q22.1 | 9.96 | 7.9 | 2.66 | 3.84 | 2.06 | 8.93E-05 | 0.0134 | Altered group |
| RPL7 | 8q21.11 | 10.78 | 10.2 | 0.77 | 0.92 | 0.58 | 9.17E-05 | 0.0136 | Altered group |
| GPATCH4 | 1q22-q23.1 | 10.25 | 9.76 | 0.66 | 0.67 | 0.49 | 9.67E-05 | 0.0142 | Altered group |
| RRP12 | 10q24.1 | 10.01 | 9.58 | 0.57 | 0.76 | 0.43 | 9.97E-05 | 0.0144 | Altered group |
| AGO2 | 8q24.3 | 7.94 | 7.4 | 0.73 | 0.78 | 0.54 | 1.04E-04 | 0.0149 | Altered group |
| EIF2S1 | 14q23.3 | 10.53 | 10.23 | 0.41 | 0.45 | 0.3 | 1.34E-04 | 0.0175 | Altered group |
| NOB1 | 16q22.1 | 10.13 | 9.75 | 0.51 | 0.68 | 0.38 | 1.43E-04 | 0.0183 | Altered group |
| WSCD1 | 17p13.2 | 7 | 6.02 | 1.34 | 1.7 | 0.98 | 1.44E-04 | 0.0183 | Altered group |
| TRMT5 | 14q23.1 | 8.65 | 8.38 | 0.38 | 0.48 | 0.28 | 1.80E-04 | 0.0217 | Altered group |
| NOP16 | 5q35.2 | 9.08 | 8.57 | 0.71 | 0.83 | 0.5 | 1.92E-04 | 0.0223 | Altered group |
| SCO1 | 17p13.1 | 9.32 | 8.93 | 0.55 | 0.6 | 0.39 | 1.99E-04 | 0.0227 | Altered group |
| EIF4A1 | 17p13.1 | 13.34 | 12.95 | 0.56 | 0.72 | 0.39 | 2.47E-04 | 0.0262 | Altered group |
| FTL | 19q13.33 | 18.54 | 17.78 | 1.1 | 1.17 | 0.76 | 2.55E-04 | 0.0266 | Altered group |
| ATP6V1C1 | 8q22.3 | 11.37 | 10.88 | 0.71 | 0.75 | 0.49 | 2.57E-04 | 0.0266 | Altered group |
| TUFT1 | 1q21.3 | 8.81 | 8.35 | 0.64 | 0.94 | 0.45 | 2.68E-04 | 0.0271 | Altered group |
| SLC51B | 15q22.31 | 7.01 | 5.63 | 1.98 | 2.26 | 1.37 | 2.82E-04 | 0.0281 | Altered group |
| FABP1 | 2p11.2 | 14.87 | 13.46 | 1.99 | 3.06 | 1.41 | 3.28E-04 | 0.0309 | Altered group |
| WDR55 | 5q31.3 | 9.59 | 9.23 | 0.53 | 0.5 | 0.36 | 3.35E-04 | 0.0311 | Altered group |
| SSB | 2q31.1 | 10.89 | 10.62 | 0.38 | 0.52 | 0.26 | 3.62E-04 | 0.0325 | Altered group |
| LYAR | 4p16.3 | 8.52 | 8.13 | 0.58 | 0.66 | 0.39 | 3.73E-04 | 0.0332 | Altered group |
| HSPA8 | 11q24.1 | 14.54 | 14.12 | 0.62 | 0.81 | 0.42 | 3.85E-04 | 0.0338 | Altered group |
| TSPO2 | 6p21.1 | 4.26 | 3.18 | 1.61 | 1.74 | 1.08 | 3.97E-04 | 0.0346 | Altered group |
| ATIC | 2q35 | 11.21 | 10.84 | 0.56 | 0.62 | 0.37 | 4.46E-04 | 0.0369 | Altered group |
| BMP2 | 20p12.3 | 8.74 | 7.79 | 1.45 | 1.33 | 0.95 | 4.63E-04 | 0.0378 | Altered group |
| TUBB2A | 6p25.2 | 11.82 | 11.18 | 0.96 | 1.15 | 0.64 | 4.66E-04 | 0.0379 | Altered group |
| BYSL | 6p21.1 | 9.35 | 9.02 | 0.5 | 0.65 | 0.33 | 5.05E-04 | 0.0393 | Altered group |
| EPS8L3 | 1p13.3 | 8.34 | 6.71 | 2.44 | 3.26 | 1.63 | 5.10E-04 | 0.0393 | Altered group |
| DDX31 | 9q34.13 | 7.86 | 7.59 | 0.42 | 0.52 | 0.28 | 5.16E-04 | 0.0394 | Altered group |
| RPL22L1 | 3q26.2 | 10.39 | 9.54 | 1.29 | 1.33 | 0.84 | 5.23E-04 | 0.0395 | Altered group |
| C1QBP | 17p13.2 | 11.01 | 10.61 | 0.61 | 0.71 | 0.4 | 5.77E-04 | 0.0418 | Altered group |
| C2ORF72 | 2q37.1 | 12.38 | 11.93 | 0.68 | 0.95 | 0.45 | 6.01E-04 | 0.043 | Altered group |
| NLRX1 | 11q23.3 | 9.08 | 8.8 | 0.42 | 0.66 | 0.28 | 6.34E-04 | 0.0448 | Altered group |
| SNTB1 | 8q24.12 | 12.25 | 11.8 | 0.67 | 1 | 0.45 | 6.52E-04 | 0.0455 | Altered group |
| FBXO25 | 8p23.3 | 9.9 | 9.4 | 0.78 | 0.86 | 0.5 | 6.68E-04 | 0.0456 | Altered group |
| GYG1 | 3q24 | 9.2 | 8.82 | 0.59 | 0.68 | 0.38 | 6.81E-04 | 0.0459 | Altered group |
| EIF5B | 2q11.2 | 11.53 | 11.17 | 0.57 | 0.5 | 0.36 | 6.88E-04 | 0.046 | Altered group |
| PARP12 | 7q34 | 10.49 | 10.1 | 0.61 | 0.74 | 0.39 | 6.96E-04 | 0.046 | Altered group |
| LRATD2 | 8q24.21 | 9.9 | 9.3 | 0.94 | 1.15 | 0.6 | 7.16E-04 | 0.0465 | Altered group |
| PLPPR1 | 9q31.1 | 8.82 | 7.84 | 1.53 | 1.91 | 0.98 | 7.28E-04 | 0.047 | Altered group |
| SHROOM1 | 5q31.1 | 11.05 | 10.59 | 0.73 | 0.98 | 0.47 | 7.77E-04 | 0.0482 | Altered group |
| ITGA6 | 2q31.1 | 11.06 | 10.52 | 0.86 | 0.9 | 0.54 | 8.17E-04 | 0.0496 | Altered group |
| PRKG2 | 4q21.21 | 0.1 | 0.53 | 0.27 | 0.97 | -0.43 | 3.33E-09 | 2.34E-05 | Unaltered group |
| KIAA0087 | 7p15.2 | 0.03 | 0.26 | 0.11 | 0.62 | -0.23 | 6.18E-09 | 3.10E-05 | Unaltered group |
| LOC145474 | 14q24.2 | 0.01 | 0.14 | 0.06 | 0.37 | -0.13 | 1.97E-08 | 7.90E-05 | Unaltered group |
| FAM83B | 6p12.1 | 0.17 | 0.96 | 0.58 | 1.79 | -0.79 | 5.19E-08 | 1.29E-04 | Unaltered group |
| ANGPTL7 | 1p36.22 | 0.12 | 0.81 | 0.38 | 1.92 | -0.69 | 6.45E-08 | 1.29E-04 | Unaltered group |
| LOC284798 | 20p11.21 | 0.01 | 0.19 | 0.06 | 0.55 | -0.18 | 6.71E-08 | 1.29E-04 | Unaltered group |
| FRG2C | 3p12.3 | 0.02 | 0.21 | 0.12 | 0.5 | -0.19 | 6.91E-08 | 1.29E-04 | Unaltered group |
| VIT | 2p22.2 | 0.04 | 0.28 | 0.15 | 0.64 | -0.24 | 8.06E-08 | 1.29E-04 | Unaltered group |
| EPHA7 | 6q16.1 | 0.18 | 0.83 | 0.48 | 1.51 | -0.66 | 8.37E-08 | 1.29E-04 | Unaltered group |
| FGF17 | 8p21.3 | 1 | 2.01 | 0.88 | 1.62 | -1.01 | 1.03E-07 | 1.38E-04 | Unaltered group |
| CLLU1OS | 12q22 | 0.08 | 0.46 | 0.24 | 1.04 | -0.38 | 1.20E-07 | 1.50E-04 | Unaltered group |
| MEP1B | 18q12.1 | 0.65 | 1.73 | 0.91 | 2.04 | -1.08 | 1.40E-07 | 1.66E-04 | Unaltered group |
| CKMT2 | 5q14.1 | 1.28 | 2.67 | 1.14 | 2.86 | -1.39 | 1.49E-07 | 1.66E-04 | Unaltered group |
| MORN5 | 9q33.2 | 0.02 | 0.17 | 0.1 | 0.41 | -0.15 | 3.01E-07 | 3.02E-04 | Unaltered group |
| GOLGA6D | 15q24.2 | 0.1 | 0.48 | 0.27 | 1.02 | -0.38 | 3.38E-07 | 3.08E-04 | Unaltered group |
| SHC4 | 15q21.1 | 1.31 | 2.25 | 0.82 | 1.97 | -0.94 | 4.85E-07 | 4.06E-04 | Unaltered group |
| HNRNPCL1 | 1p36.21 | 0.04 | 0.5 | 0.23 | 1.46 | -0.46 | 6.16E-07 | 4.42E-04 | Unaltered group |
| PROM2 | 2q11.1 | 1.68 | 2.72 | 0.96 | 2.17 | -1.04 | 1.07E-06 | 6.92E-04 | Unaltered group |
| LGI1 | 10q23.33 | 0.19 | 0.71 | 0.44 | 1.33 | -0.53 | 1.26E-06 | 7.46E-04 | Unaltered group |
| MIR1-1HG-AS1 | 20q13.33 | 0.25 | 0.77 | 0.48 | 1.15 | -0.52 | 1.51E-06 | 8.48E-04 | Unaltered group |
| MPIG6B | 6p21.33 | 0.01 | 0.13 | 0.08 | 0.35 | -0.11 | 2.15E-06 | 1.17E-03 | Unaltered group |
| GLIS3-AS1 | 9p24.2 | 0.05 | 0.25 | 0.18 | 0.51 | -0.2 | 2.51E-06 | 1.33E-03 | Unaltered group |
| CALHM4 | 6q22.1 | 0.03 | 0.22 | 0.14 | 0.58 | -0.19 | 3.04E-06 | 1.57E-03 | Unaltered group |
| LYPD3 | 19q13.31 | 3.49 | 4.6 | 1.2 | 1.4 | -1.12 | 3.14E-06 | 1.58E-03 | Unaltered group |
| VAX1 | 10q25.3 | 0.02 | 0.28 | 0.1 | 0.95 | -0.26 | 3.60E-06 | 1.76E-03 | Unaltered group |
| IL36RN | 2q14.1 | 0.01 | 0.17 | 0.07 | 0.57 | -0.16 | 3.83E-06 | 1.80E-03 | Unaltered group |
| SEC14L3 | 22q12.2 | 1.37 | 3.13 | 1.89 | 2.38 | -1.75 | 3.92E-06 | 1.80E-03 | Unaltered group |
| PEBP4 | 8p21.3 | 0.52 | 1.59 | 1.06 | 2.33 | -1.07 | 4.38E-06 | 1.95E-03 | Unaltered group |
| USP44 | 12q22 | 0.47 | 1.15 | 0.7 | 1.4 | -0.68 | 4.98E-06 | 2.18E-03 | Unaltered group |
| RPS6KA6 | Xq21.1 | 0.21 | 0.77 | 0.54 | 1.42 | -0.56 | 6.12E-06 | 2.57E-03 | Unaltered group |
| BMP10 | 2p13.3 | 0.06 | 0.41 | 0.28 | 1.06 | -0.35 | 6.14E-06 | 2.57E-03 | Unaltered group |
| CHRM2 | 7q33 | 0.07 | 0.37 | 0.26 | 0.86 | -0.3 | 6.27E-06 | 2.57E-03 | Unaltered group |
| PLEKHH3 | 17q21.2 | 8.25 | 9.02 | 0.88 | 0.79 | -0.77 | 7.02E-06 | 2.82E-03 | Unaltered group |
| SNX29P2 | 16p11.2 | 2.89 | 4.06 | 1.33 | 1.45 | -1.17 | 7.76E-06 | 3.06E-03 | Unaltered group |
| PLD5 | 1q43 | 0.44 | 1.11 | 0.67 | 1.63 | -0.67 | 8.73E-06 | 3.26E-03 | Unaltered group |
| PABPN1L | 16q24.3 | 0.02 | 0.15 | 0.11 | 0.38 | -0.13 | 9.46E-06 | 3.37E-03 | Unaltered group |
| C10ORF67 | 10p12.2 | 0.21 | 0.7 | 0.51 | 1.12 | -0.49 | 9.55E-06 | 3.37E-03 | Unaltered group |
| GSTA5 | 6p12.2 | 0.04 | 0.22 | 0.17 | 0.46 | -0.18 | 9.91E-06 | 3.43E-03 | Unaltered group |
| SBK1 | 16p12.1 | 3.56 | 4.59 | 1.16 | 1.67 | -1.03 | 1.02E-05 | 3.43E-03 | Unaltered group |
| FTHL17 | Xp21.2 | 0.03 | 0.35 | 0.16 | 1.22 | -0.32 | 1.16E-05 | 3.67E-03 | Unaltered group |
| KCNN2 | 5q22.3 | 2.82 | 3.73 | 0.95 | 2.13 | -0.91 | 1.17E-05 | 3.67E-03 | Unaltered group |
| LINC01634 | 22q11.21 | 0.31 | 0.75 | 0.48 | 0.97 | -0.45 | 1.21E-05 | 3.74E-03 | Unaltered group |
| KIAA0895L | 16q22.1 | 6.42 | 7.07 | 0.76 | 0.9 | -0.65 | 1.27E-05 | 3.86E-03 | Unaltered group |
| CALML5 | 10p15.1 | 0.06 | 0.31 | 0.19 | 0.89 | -0.26 | 1.34E-05 | 4.03E-03 | Unaltered group |
| ZNF735 | 7q11.21 | 0.09 | 0.47 | 0.27 | 1.3 | -0.38 | 1.40E-05 | 4.13E-03 | Unaltered group |
| RAB25 | 1q22 | 1.11 | 2.24 | 1.17 | 2.89 | -1.13 | 1.86E-05 | 5.26E-03 | Unaltered group |
| LTB4R2 | 14q12 | 4.59 | 5.31 | 0.86 | 1.01 | -0.72 | 2.11E-05 | 5.65E-03 | Unaltered group |
| SERPINB5 | 18q21.33 | 0.35 | 0.94 | 0.62 | 1.58 | -0.59 | 2.73E-05 | 7.12E-03 | Unaltered group |
| MS4A3 | 11q12.1 | 0.02 | 0.14 | 0.1 | 0.44 | -0.13 | 2.89E-05 | 7.28E-03 | Unaltered group |
| MS4A2 | 11q12.1 | 0.96 | 1.91 | 1.13 | 1.7 | -0.95 | 2.91E-05 | 7.28E-03 | Unaltered group |
| ATG16L2 | 11q13.4 | 7.49 | 8.16 | 0.83 | 0.75 | -0.66 | 2.96E-05 | 7.28E-03 | Unaltered group |
| IGFALS | 16p13.3 | 5.49 | 7.59 | 2.6 | 2.73 | -2.1 | 2.97E-05 | 7.28E-03 | Unaltered group |
| CCDC39 | 3q26.33 | 1.79 | 2.52 | 0.88 | 1.21 | -0.73 | 3.15E-05 | 7.61E-03 | Unaltered group |
| PLCZ1 | 12p12.3 | 0.11 | 0.35 | 0.25 | 0.61 | -0.23 | 3.23E-05 | 7.73E-03 | Unaltered group |
| PTCHD1 | Xp22.11 | 0.23 | 0.62 | 0.41 | 1.07 | -0.39 | 3.58E-05 | 8.37E-03 | Unaltered group |
| CCNL2 | 1p36.33 | 10.31 | 10.94 | 0.8 | 0.78 | -0.63 | 3.91E-05 | 8.92E-03 | Unaltered group |
| ARPP21 | 3p22.3 | 1.42 | 2.45 | 1.21 | 2.34 | -1.04 | 4.02E-05 | 8.92E-03 | Unaltered group |
| SH2B1 | 16p11.2 | 9.57 | 9.95 | 0.49 | 0.5 | -0.38 | 4.26E-05 | 9.24E-03 | Unaltered group |
| ASB16-AS1 | 17q21.31 | 6.77 | 7.19 | 0.53 | 0.68 | -0.42 | 4.28E-05 | 9.24E-03 | Unaltered group |
| SLC6A15 | 12q21.31 | 0.22 | 0.82 | 0.54 | 2.02 | -0.6 | 4.46E-05 | 9.48E-03 | Unaltered group |
| CDH12 | 5p14.3 | 1.71 | 2.79 | 1.3 | 2.22 | -1.08 | 4.52E-05 | 9.48E-03 | Unaltered group |
| NEAT1 | 11q13.1 | 11.87 | 12.65 | 1 | 1.07 | -0.78 | 4.90E-05 | 0.0101 | Unaltered group |
| MAPT-IT1 | 17q21.31 | 0.7 | 1.37 | 0.82 | 1.31 | -0.67 | 4.92E-05 | 0.0101 | Unaltered group |
| SLC5A7 | 2q12.3 | 0.02 | 0.19 | 0.11 | 0.67 | -0.17 | 5.09E-05 | 0.0103 | Unaltered group |
| KBTBD12 | 3q21.3 | 0.37 | 0.92 | 0.6 | 1.57 | -0.55 | 5.38E-05 | 0.0106 | Unaltered group |
| SLC38A8 | 16q23.3 | 0.26 | 0.79 | 0.51 | 1.71 | -0.53 | 5.39E-05 | 0.0106 | Unaltered group |
| OR3A2 | 17p13.3 | 0.02 | 0.14 | 0.1 | 0.48 | -0.13 | 5.53E-05 | 0.0108 | Unaltered group |
| MRGPRX3 | 11p15.1 | 0.05 | 0.27 | 0.18 | 0.8 | -0.22 | 5.64E-05 | 0.0108 | Unaltered group |
| GPR150 | 5q15 | 0.37 | 0.85 | 0.58 | 1.06 | -0.48 | 5.71E-05 | 0.0108 | Unaltered group |
| ADAM30 | 1p12 | 0.03 | 0.17 | 0.14 | 0.41 | -0.14 | 5.80E-05 | 0.0109 | Unaltered group |
| ASCL1 | 12q23.2 | 1.27 | 2.75 | 1.85 | 2.91 | -1.48 | 6.67E-05 | 0.0118 | Unaltered group |
| POTEC | 18p11.21 | 0.02 | 0.13 | 0.09 | 0.4 | -0.11 | 6.84E-05 | 0.0118 | Unaltered group |
| KCTD8 | 4p13 | 0.1 | 0.4 | 0.29 | 1 | -0.3 | 6.88E-05 | 0.0118 | Unaltered group |
| VAMP1 | 12p13.31 | 6.51 | 7.23 | 0.95 | 0.94 | -0.72 | 7.12E-05 | 0.0119 | Unaltered group |
| SCNN1D | 1p36.33 | 5.87 | 6.8 | 1.23 | 1.23 | -0.93 | 7.28E-05 | 0.0119 | Unaltered group |
| TNRC6A | 16p12.1 | 9.43 | 9.89 | 0.6 | 0.64 | -0.46 | 7.31E-05 | 0.0119 | Unaltered group |
| ANXA8 | 10q11.22 | 1.38 | 2.74 | 1.74 | 2.51 | -1.36 | 7.33E-05 | 0.0119 | Unaltered group |
| MRGPRE | 11p15.4 | 0.01 | 0.13 | 0.06 | 0.53 | -0.12 | 7.55E-05 | 0.012 | Unaltered group |
| LINC00032 | 9p21.2 | 0.02 | 0.13 | 0.12 | 0.32 | -0.11 | 7.57E-05 | 0.012 | Unaltered group |
| RLBP1 | 15q26.1 | 0.03 | 0.17 | 0.14 | 0.46 | -0.14 | 8.24E-05 | 0.0128 | Unaltered group |
| LARP6 | 15q23 | 4.61 | 5.86 | 1.64 | 2.03 | -1.25 | 8.42E-05 | 0.0129 | Unaltered group |
| RBFOX3 | 17q25.3 | 0.34 | 0.77 | 0.55 | 0.81 | -0.43 | 8.43E-05 | 0.0129 | Unaltered group |
| CHRNA9 | 4p14 | 0.02 | 0.18 | 0.1 | 0.7 | -0.17 | 8.90E-05 | 0.0134 | Unaltered group |
| VASN | 16p13.3 | 9.45 | 10.23 | 1.06 | 0.86 | -0.78 | 9.28E-05 | 0.0137 | Unaltered group |
| MAFB | 20q12 | 8.79 | 9.48 | 0.9 | 1.14 | -0.68 | 9.78E-05 | 0.0142 | Unaltered group |
| SLC36A2 | 5q33.1 | 0.1 | 0.36 | 0.26 | 0.92 | -0.26 | 1.08E-04 | 0.0153 | Unaltered group |
| MYO15B | 17q25.1 | 9.29 | 10.07 | 1.06 | 1.2 | -0.78 | 1.21E-04 | 0.0165 | Unaltered group |
| ANKRD23 | 2q11.2 | 4.69 | 5.29 | 0.84 | 0.82 | -0.61 | 1.26E-04 | 0.017 | Unaltered group |
| MBD4 | 3q21.3 | 9.27 | 9.54 | 0.36 | 0.49 | -0.27 | 1.31E-04 | 0.0175 | Unaltered group |
| SUN1 | 7p22.3 | 10.34 | 10.77 | 0.59 | 0.65 | -0.43 | 1.33E-04 | 0.0175 | Unaltered group |
| ST6GALNAC2 | 17q25.1 | 4.56 | 5.78 | 1.67 | 1.84 | -1.22 | 1.34E-04 | 0.0175 | Unaltered group |
| LOC100128076 | 9q22.31 | 0.02 | 0.12 | 0.09 | 0.42 | -0.11 | 1.39E-04 | 0.018 | Unaltered group |
| ENGASE | 17q25.3 | 8.61 | 9.08 | 0.66 | 0.66 | -0.47 | 1.49E-04 | 0.0188 | Unaltered group |
| MYL7 | 7p13 | 0.02 | 0.14 | 0.1 | 0.48 | -0.12 | 1.65E-04 | 0.0206 | Unaltered group |
| CALB2 | 16q22.2 | 0.57 | 1.12 | 0.69 | 1.48 | -0.55 | 1.70E-04 | 0.0211 | Unaltered group |
| TSPYL6 | 2p16.2 | 0.03 | 0.2 | 0.15 | 0.66 | -0.17 | 1.75E-04 | 0.0216 | Unaltered group |
| DCUN1D2 | 13q34 | 7.2 | 7.64 | 0.62 | 0.68 | -0.44 | 1.76E-04 | 0.0216 | Unaltered group |
| IL13RA2 | Xq23 | 1.61 | 2.56 | 1.24 | 2.19 | -0.95 | 1.77E-04 | 0.0216 | Unaltered group |
| CLTRN | Xp22.2 | 4.51 | 5.74 | 1.71 | 2.17 | -1.24 | 1.79E-04 | 0.0217 | Unaltered group |
| MAS1L | 6p22.1 | 0.04 | 0.24 | 0.24 | 0.6 | -0.2 | 1.83E-04 | 0.0219 | Unaltered group |
| MAPK8IP3 | 16p13.3 | 8.53 | 9.22 | 0.99 | 0.87 | -0.69 | 1.85E-04 | 0.022 | Unaltered group |
| PWRN1 | 15q11.2 | 0.02 | 0.13 | 0.1 | 0.44 | -0.11 | 1.87E-04 | 0.0221 | Unaltered group |
| C16ORF92 | 16p11.2 | 0.03 | 0.14 | 0.12 | 0.38 | -0.11 | 1.91E-04 | 0.0223 | Unaltered group |
| CT47A6 | Xq24 | 0.03 | 0.27 | 0.16 | 1.06 | -0.24 | 1.92E-04 | 0.0223 | Unaltered group |
| PILRB | 7q22.1 | 9.46 | 10.04 | 0.82 | 0.78 | -0.58 | 1.96E-04 | 0.0226 | Unaltered group |
| LINC00930 | 15q26.1 | 0.29 | 0.67 | 0.47 | 1.01 | -0.37 | 2.00E-04 | 0.0227 | Unaltered group |
| LOC100129534 | 1p36.32 | 3.66 | 4.37 | 1 | 1.11 | -0.71 | 2.03E-04 | 0.0227 | Unaltered group |
| TNFRSF14-AS1 | 1p36.32 | 6.23 | 7.03 | 1.11 | 1.34 | -0.79 | 2.04E-04 | 0.0228 | Unaltered group |
| SYT9 | 11p15.4 | 0.86 | 2.13 | 1.73 | 2.74 | -1.28 | 2.09E-04 | 0.023 | Unaltered group |
| ST5 | 11p15.4 | 9.38 | 10.1 | 1.04 | 0.79 | -0.72 | 2.18E-04 | 0.0237 | Unaltered group |
| FAM71E2 | 19q13.42 | 0.02 | 0.16 | 0.1 | 0.65 | -0.15 | 2.30E-04 | 0.0249 | Unaltered group |
| ARGFXP2 | 17q11.2 | 0.22 | 0.48 | 0.35 | 0.6 | -0.26 | 2.31E-04 | 0.0249 | Unaltered group |
| DLGAP2 | 8p23.3 | 0.57 | 1.16 | 0.77 | 1.5 | -0.59 | 2.33E-04 | 0.0249 | Unaltered group |
| CROCCP3 | 1p36.13 | 4.14 | 4.66 | 0.74 | 0.9 | -0.52 | 2.49E-04 | 0.0262 | Unaltered group |
| HEXIM1 | 17q21.31 | 9.5 | 9.96 | 0.68 | 0.62 | -0.46 | 2.59E-04 | 0.0266 | Unaltered group |
| MYO3A | 10p12.1 | 0.21 | 0.68 | 0.52 | 1.67 | -0.47 | 2.60E-04 | 0.0266 | Unaltered group |
| PHLDB2 | 3q13.2 | 8.96 | 9.57 | 0.89 | 0.89 | -0.61 | 2.65E-04 | 0.027 | Unaltered group |
| ULK4P2 | 15q13.2 | 0.12 | 0.36 | 0.33 | 0.62 | -0.25 | 2.68E-04 | 0.0271 | Unaltered group |
| PCP2 | 19p13.2 | 1.4 | 2.16 | 1.09 | 1.36 | -0.76 | 2.75E-04 | 0.0276 | Unaltered group |
| CRYBA1 | 17q11.2 | 0.05 | 0.2 | 0.2 | 0.4 | -0.15 | 2.82E-04 | 0.0281 | Unaltered group |
| ADSSL1 | 14q32.33 | 7.24 | 8.08 | 1.22 | 1.4 | -0.85 | 2.86E-04 | 0.0281 | Unaltered group |
| KLHL17 | 1p36.33 | 6.16 | 6.66 | 0.73 | 0.73 | -0.5 | 2.87E-04 | 0.0281 | Unaltered group |
| ADGB | 6q24.3 | 0.03 | 0.17 | 0.14 | 0.5 | -0.13 | 2.89E-04 | 0.0281 | Unaltered group |
| GCSAML | 1q44 | 0.32 | 0.81 | 0.64 | 1.31 | -0.49 | 2.90E-04 | 0.0281 | Unaltered group |
| KRTAP5-8 | 11q13.4 | 0.4 | 0.78 | 0.53 | 0.85 | -0.38 | 3.06E-04 | 0.0295 | Unaltered group |
| PLEKHM1P1 | 17q24.1 | 6.1 | 6.67 | 0.86 | 0.8 | -0.58 | 3.21E-04 | 0.0307 | Unaltered group |
| BRICD5 | 16p13.3 | 3.74 | 4.57 | 1.24 | 1.19 | -0.84 | 3.24E-04 | 0.0308 | Unaltered group |
| ANKRD35 | 1q21.1 | 3.41 | 5.14 | 2.57 | 2.61 | -1.74 | 3.26E-04 | 0.0308 | Unaltered group |
| SSMEM1 | 7q32.2 | 0.03 | 0.13 | 0.12 | 0.33 | -0.1 | 3.30E-04 | 0.0309 | Unaltered group |
| CSNK1A1P1 | 15q14 | 0.76 | 1.2 | 0.6 | 1.06 | -0.44 | 3.34E-04 | 0.0311 | Unaltered group |
| SS18L1 | 20q13.33 | 9.15 | 9.59 | 0.63 | 0.88 | -0.44 | 3.36E-04 | 0.0311 | Unaltered group |
| SCEL | 13q22.3 | 0.09 | 0.31 | 0.27 | 0.69 | -0.22 | 3.40E-04 | 0.0312 | Unaltered group |
| TNNT2 | 1q32.1 | 1.02 | 1.79 | 1.07 | 1.92 | -0.78 | 3.41E-04 | 0.0312 | Unaltered group |
| ZGPAT | 20q13.33 | 10.16 | 10.6 | 0.62 | 1.01 | -0.44 | 3.42E-04 | 0.0312 | Unaltered group |
| GFAP | 17q21.31 | 1.75 | 2.86 | 1.62 | 1.97 | -1.11 | 3.43E-04 | 0.0312 | Unaltered group |
| CSAD | 12q13.13 | 8.41 | 9.14 | 1.07 | 1.21 | -0.73 | 3.60E-04 | 0.0325 | Unaltered group |
| SNED1 | 2q37.3 | 7.35 | 7.98 | 0.92 | 1.11 | -0.63 | 3.63E-04 | 0.0325 | Unaltered group |
| ANKS3 | 16p13.3 | 7.64 | 8.08 | 0.66 | 0.73 | -0.44 | 3.69E-04 | 0.0329 | Unaltered group |
| PPL | 16p13.3 | 7.64 | 8.89 | 1.9 | 1.47 | -1.25 | 3.76E-04 | 0.0333 | Unaltered group |
| TNNI3K | 1p31.1 | 0.81 | 1.35 | 0.79 | 1.07 | -0.54 | 3.82E-04 | 0.0336 | Unaltered group |
| CASTOR3 | 7q22.1 | 6.45 | 7.04 | 0.88 | 1.04 | -0.59 | 4.05E-04 | 0.0349 | Unaltered group |
| DPF3 | 14q24.2 | 3.26 | 4.04 | 1.11 | 1.71 | -0.77 | 4.06E-04 | 0.0349 | Unaltered group |
| PRSS8 | 16p11.2 | 4.13 | 6.42 | 3.42 | 3.81 | -2.29 | 4.14E-04 | 0.0354 | Unaltered group |
| STAG3L3 | 7q11.23 | 6.57 | 7.1 | 0.81 | 0.78 | -0.53 | 4.18E-04 | 0.0355 | Unaltered group |
| FAM177B | 1q41 | 0.53 | 1.04 | 0.69 | 1.39 | -0.51 | 4.26E-04 | 0.036 | Unaltered group |
| GABRE | Xq28 | 6.33 | 7.76 | 2.19 | 2 | -1.44 | 4.30E-04 | 0.0361 | Unaltered group |
| ARHGAP33 | 19q13.12 | 6.4 | 6.95 | 0.81 | 1 | -0.54 | 4.39E-04 | 0.0366 | Unaltered group |
| WFDC2 | 20q13.12 | 2.55 | 4.02 | 2.15 | 3.2 | -1.48 | 4.46E-04 | 0.0369 | Unaltered group |
| ZNF300P1 | 5q33.1 | 2.33 | 3.19 | 1.24 | 1.99 | -0.86 | 4.71E-04 | 0.0381 | Unaltered group |
| CDH7 | 18q22.1 | 0.1 | 0.39 | 0.35 | 1.08 | -0.3 | 4.75E-04 | 0.0384 | Unaltered group |
| NCAM1 | 11q23.2 | 3.21 | 4.16 | 1.39 | 2.18 | -0.96 | 4.82E-04 | 0.0386 | Unaltered group |
| GARNL3 | 9q33.3 | 4.47 | 5.37 | 1.37 | 1.53 | -0.9 | 4.84E-04 | 0.0386 | Unaltered group |
| CELF5 | 19p13.3 | 2.22 | 3.68 | 2.2 | 2.68 | -1.46 | 4.84E-04 | 0.0386 | Unaltered group |
| HOXD11 | 2q31.1 | 0.21 | 0.62 | 0.51 | 1.37 | -0.41 | 4.92E-04 | 0.0391 | Unaltered group |
| RGL2 | 6p21.32 | 9.43 | 9.79 | 0.54 | 0.69 | -0.36 | 5.07E-04 | 0.0393 | Unaltered group |
| SLC1A6 | 19p13.12 | 0.03 | 0.19 | 0.16 | 0.7 | -0.16 | 5.07E-04 | 0.0393 | Unaltered group |
| CD164L2 | 1p36.11 | 0.08 | 0.28 | 0.23 | 0.8 | -0.21 | 5.12E-04 | 0.0393 | Unaltered group |
| NTF4 | 19q13.33 | 0.04 | 0.19 | 0.16 | 0.61 | -0.15 | 5.12E-04 | 0.0393 | Unaltered group |
| AMOTL2 | 3q22.2 | 8.58 | 9.17 | 0.89 | 1.13 | -0.59 | 5.23E-04 | 0.0395 | Unaltered group |
| KRT16 | 17q21.2 | 0.55 | 1.33 | 1.07 | 2.29 | -0.78 | 5.23E-04 | 0.0395 | Unaltered group |
| RNF39 | 6p22.1 | 1.91 | 2.73 | 1.23 | 1.56 | -0.82 | 5.26E-04 | 0.0395 | Unaltered group |
| CR1L | 1q32.2 | 0.35 | 0.78 | 0.59 | 1.25 | -0.43 | 5.36E-04 | 0.0401 | Unaltered group |
| ATP6V1G2 | 6p21.33 | 2.58 | 3.25 | 1.02 | 1.22 | -0.67 | 5.38E-04 | 0.0401 | Unaltered group |
| NEBL | 10p12.31 | 4.16 | 5.54 | 2.1 | 2.66 | -1.39 | 5.45E-04 | 0.0404 | Unaltered group |
| NYAP2 | 2q36.3 | 0.04 | 0.23 | 0.18 | 0.82 | -0.19 | 5.46E-04 | 0.0404 | Unaltered group |
| FBXL16 | 16p13.3 | 3.23 | 4.74 | 2.31 | 2.5 | -1.5 | 5.51E-04 | 0.0407 | Unaltered group |
| ANKRD26P3 | 13q12.11 | 0.02 | 0.12 | 0.1 | 0.43 | -0.1 | 5.68E-04 | 0.0416 | Unaltered group |
| LINC00472 | 6q13 | 1.32 | 1.96 | 0.98 | 1.11 | -0.63 | 5.73E-04 | 0.0417 | Unaltered group |
| BAIAP2-DT | 17q25.3 | 8.59 | 9.11 | 0.79 | 0.88 | -0.51 | 5.88E-04 | 0.0425 | Unaltered group |
| FGF23 | 12p13.32 | 0.16 | 0.45 | 0.34 | 1.13 | -0.29 | 5.93E-04 | 0.0426 | Unaltered group |
| TPTEP2 | 22q13.1 | 3.11 | 3.83 | 1.14 | 0.96 | -0.72 | 5.94E-04 | 0.0426 | Unaltered group |
| LTB4R | 14q12 | 6.48 | 7.18 | 1.09 | 1.06 | -0.7 | 6.07E-04 | 0.0432 | Unaltered group |
| RNF165 | 18q21.1 | 2.52 | 3.52 | 1.54 | 1.88 | -1 | 6.16E-04 | 0.0437 | Unaltered group |
| ZMAT4 | 8p11.21 | 0.17 | 0.5 | 0.42 | 1.16 | -0.33 | 6.50E-04 | 0.0455 | Unaltered group |
| LINC02249 | 15q13.2 | 0.24 | 0.66 | 0.59 | 1.26 | -0.43 | 6.55E-04 | 0.0455 | Unaltered group |
| ADRB1 | 10q25.3 | 1.91 | 2.85 | 1.46 | 1.76 | -0.94 | 6.57E-04 | 0.0455 | Unaltered group |
| MIR99AHG | 21q21.1 | 3.38 | 4.18 | 1.22 | 1.6 | -0.8 | 6.62E-04 | 0.0456 | Unaltered group |
| RFPL3S | 22q12.3 | 1.31 | 1.96 | 1.02 | 1.17 | -0.65 | 6.65E-04 | 0.0456 | Unaltered group |
| CBLN3 | 14q12 | 4.77 | 5.59 | 1.28 | 1.37 | -0.82 | 6.72E-04 | 0.0456 | Unaltered group |
| DGKE | 17q22 | 5.78 | 6.48 | 1.08 | 1.28 | -0.7 | 6.72E-04 | 0.0456 | Unaltered group |
| ZDHHC11 | 5p15.33 | 4.64 | 5.57 | 1.45 | 1.65 | -0.93 | 6.79E-04 | 0.0459 | Unaltered group |
| CCDC160 | Xq26.2 | 0.14 | 0.41 | 0.38 | 0.87 | -0.28 | 6.83E-04 | 0.0459 | Unaltered group |
| CATSPERD | 19p13.3 | 0.02 | 0.13 | 0.11 | 0.46 | -0.11 | 6.98E-04 | 0.046 | Unaltered group |
| FAM13A | 4q22.1 | 7.66 | 8.48 | 1.28 | 1.6 | -0.82 | 7.01E-04 | 0.046 | Unaltered group |
| PRB3 | 12p13.2 | 0.02 | 0.13 | 0.11 | 0.46 | -0.11 | 7.02E-04 | 0.046 | Unaltered group |
| TRIM2 | 4q31.3 | 7.98 | 8.67 | 1.08 | 1.25 | -0.69 | 7.02E-04 | 0.046 | Unaltered group |
| TCAP | 17q12 | 3.06 | 3.98 | 1.42 | 1.89 | -0.92 | 7.09E-04 | 0.0463 | Unaltered group |
| POLM | 7p13 | 8.5 | 8.79 | 0.45 | 0.48 | -0.28 | 7.20E-04 | 0.0467 | Unaltered group |
| PDXDC2P-NPIPB14P | 16q22.1 | 7.08 | 7.85 | 1.25 | 0.98 | -0.77 | 7.40E-04 | 0.0476 | Unaltered group |
| RASSF5 | 1q32.1 | 7.81 | 8.45 | 1.01 | 1.1 | -0.64 | 7.46E-04 | 0.0477 | Unaltered group |
| LINC00115 | 1p36.33 | 3.9 | 4.4 | 0.8 | 0.87 | -0.5 | 7.47E-04 | 0.0477 | Unaltered group |
| BDKRB2 | 14q32.2 | 5.62 | 6.57 | 1.5 | 1.77 | -0.96 | 7.52E-04 | 0.0477 | Unaltered group |
| RARA | 17q21.2 | 10.26 | 10.63 | 0.59 | 0.64 | -0.37 | 7.54E-04 | 0.0477 | Unaltered group |
| COL25A1 | 4q25 | 0.91 | 1.56 | 0.99 | 1.48 | -0.65 | 7.57E-04 | 0.0477 | Unaltered group |
| TSSK3 | 1p35.1 | 3.95 | 4.59 | 1.02 | 1.13 | -0.64 | 7.59E-04 | 0.0477 | Unaltered group |
| TULP1 | 6p21.31 | 0.08 | 0.25 | 0.22 | 0.56 | -0.16 | 7.64E-04 | 0.0477 | Unaltered group |
| CCDC78 | 16p13.3 | 2.31 | 3.18 | 1.36 | 1.59 | -0.87 | 7.64E-04 | 0.0477 | Unaltered group |
| SH3BP2 | 4p16.3 | 9.32 | 9.91 | 0.95 | 0.84 | -0.59 | 7.70E-04 | 0.0479 | Unaltered group |
| CAPZA3 | 12p12.3 | 0.78 | 1.42 | 0.99 | 1.31 | -0.64 | 7.81E-04 | 0.0483 | Unaltered group |
| NFE2L1 | 17q21.32 | 12.75 | 13.1 | 0.55 | 0.66 | -0.35 | 7.93E-04 | 0.0489 | Unaltered group |
| PLET1 | 11q23.1 | 0.07 | 0.22 | 0.2 | 0.49 | -0.15 | 7.97E-04 | 0.049 | Unaltered group |
| TRHDE-AS1 | 12q21.1 | 0.85 | 2 | 1.78 | 2.56 | -1.15 | 8.02E-04 | 0.049 | Unaltered group |
| RPL32P3 | 3q21.3 | 5.99 | 6.42 | 0.68 | 0.79 | -0.43 | 8.02E-04 | 0.049 | Unaltered group |
| DCAF12L2 | Xq25 | 0.11 | 0.37 | 0.36 | 0.84 | -0.26 | 8.14E-04 | 0.0495 | Unaltered group |