Long Noncoding RNA miR503HG, a Prognostic Indicator, Inhibits Tumor Metastasis by Regulating The HNRNPA2B1/NF-κB Pathway in Hepatocellular Carcinoma

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Supplementary Materials and Methods

5’ and 3’ Rapid Amplification of cDNA Ends (RACE) analysis

5’RACE and 3’RACE analyses were performed with 5μg of total RNA. The SMARTer™ RACE cDNA kit (Clontech) was used according to the manufacturer’s instructions. The gene-specific primers used for PCR are presented in Supplementary Table S5.

Lentivirus production and infection

The miR503HG sequence was amplified and cloned into the pWPXL lentiviral vector (a gift from Dr. Didier Trono) to generate pWPXL-miR503HG. The primer sequences are shown in Supplementary Table S5. Lentiviral particles were harvested 48 h after HEK 293T cells were transfected with pWPXL-miR503HG, the packaging plasmid psPAX2 and the VSV-G envelope plasmid pMD2.G (a gift from Dr. Didier Trono) using Lipofectamine 2000 (Invitrogen, Carlsbad, CA). SMMC-7721 and Huh-7 cells were infected with recombinant lentiviral transducing units plus 6 μg/mL polybrene (Sigma, MA, USA).

In vitro migration assays

For the transwell migration assays, 5x10⁴ cells were plated in the top chamber of each insert (BD Biosciences, MA, USA) with a non-coated membrane. For the invasion assays, 1x10⁵ cells were were placed into the upper chamber with a Matrigel-coated membrane (BD Biosciences, MA, USA). After several hours of incubation at 37°C, cells that migrated or invaded were fixed and stained in dye solution containing 0.1% crystal violet and 20% methanol. The number of cells that had migrated or invaded was counted and imaged using an IX71 inverted microscope (Olympus Corp, Tokyo, Japan).
In vivo assays for metastasis

For the metastasis assays, 2×10^6 Huh7 cells were infected with the Lenti-miR503HG or the mock vector, suspended in 200μL of serum-free DMEM, and injected into nude mice through the tail vein (male BALB/c-nu/nu mice, 10 per group). After six weeks, the mice were sacrificed, and their lungs were dissected, fixed with phosphate-buffered neutral formalin, and prepared for standard histological examination. For the in suit exnograft assays, 5×10^6 SMMC-7721 cells stably expressing miR503HG, together with stably expressing vector control, were suspended in 40μL of DMEM/Matrigel (1:1) for each mouse. Through an 8-mm transverse incision in the upper abdomen, each nude mouse was inoculated orthotopically in the left hepatic lobe with a microsyringe. After 8 weeks, mice were sacrificed, livers were dissected, fixed with phosphate-buffered neutral formalin, paraffin-embedded and prepared for standard histological examination. Mice were handled and housed according to protocols approved by the Shanghai Medical Experimental Animal Care Commission.

Luciferase reporter assay

For the luciferase analysis of signaling pathway reporter vectors, HEK 293T knockdown of HNRNPA2B1 were seeded in 96-well plates at a density of 5,000 cells per well. After 24h, the cells were transiently transfected with 5ng of pRL-CMV Renilla luciferase reporter, 30ng of the pLUC vectors containing β-catenin, ERK, p53, NFAT, HSF, AP-1, IRF, CEBPA, MYC, NF-κB, and STAT3 consensus binding sequence, respectively. After 48 h, luciferase activities were measured using the dual-luciferase reporter assay system (Promega, Madison, WI, USA).
Oligonucleotide transfection

Small interfering (si) RNA duplexes and miR503 mimics were designed and synthesized by Ribobio (Guangzhou, China). siRNAs, miRNA mimics, inhibitors and corresponding negative control (NC) were synthesized by the sequences used are shown in Supplementary Table S5. Cells were transfected using Lipofectamine 2000 according to the manufacturer’s instructions.

Real-time PCR (qPCR)

Total RNA was extracted from cells using Trizol reagent (Invitrogen) according to the manufacturer’s instruction. A total of 1μg of RNA was subjected to reverse transcription using HiScript II Q RT SuperMix for qPCR (+gDNA wiper) (Vazyme Biotech, Nanjing, China) and real-time PCR was carried out using AceQ qPCR SYBR Green Master Mix (Vazyme Biotech, Nanjing, China). The PCR reaction conditions were as follows: 95°C for 15s followed by 40 cycles of 95°C for 5s and 60°C for 30s. The expression levels were normalized against those of the internal reference gene β-actin, the relative expression levels were determined by the following equation: 2-ΔΔCt (ΔCt=ΔCttarget - ΔCtβ-actin). A list of primers used for real-time PCR experiments were in Supplementary Table S5.

Western blot analysis

Proteins from the cell lysates were prepared in 1x sodium dodecyl sulfate buffer, separated by sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE) and transferred to a nitrocellulose membrane (Bio-Rad, Hercules, CA, USA). The membranes were blocked with 5% non-fat milk and incubated with the appropriate antibody. The antigen-antibody complex was detected with enhanced chemiluminescence reagents (Pierce, Rockford, IL). The antibodies used in this study
are shown in Supplementary Table S6.
Supplementary Figures

Supplementary Fig. S1

(A) Five lncRNAs and miRNAs in the chromosomal locus. (B) The expression levels of five lncRNAs in 36 pairs of HCC tissues and corresponding noncancerous liver tissues.
Supplementary Fig. S2

Characterization of miR503HG as long non-coding RNA.

(A) Agarose gel electrophoresis of PCR products from the 5'-RACE and 3'-RACE procedure (left). The sequencing of PCR products reveals the boundary between the universal anchor primer and the miR503HG sequences (right). The red arrow indicates a putative transcriptional start and end site. (B) The nucleotide sequence of the full-length miR503HG. (C) The coding potential of miR503HG in several prediction software, and results showed that miR503HG didn’t have any coding potential. (D) ORF Finder software prediction (the ORF finder, https://www.ncbi.nlm.nih.gov/orffinder/) for the protein-coding potential of miR503HG.
**Supplementary Fig. S3. The expression level of miR503HG in HCC cells**

(A) Real-time PCR analysis of miR503HG expression in 8 HCC cell lines and normal liver cell L02. (B) Real-time PCR analysis of miR503HG expression in SMMC-7721 and Huh7 cells after transfection with two siRNAs against miR503HG (left). The expression levels of miR503HG in SMMC-7721 and Huh7 cells that had been stably transfected with lentivirus encoding miR503HG (right). (C) Migration assays of SMCC-7721 and Huh7 cells with miR503HG knockdown by using siRNA-2#. (D) Invasion assays of SMCC-7721 and Huh7 cells with miR503HG knockdown by using siRNA-2#. Error bars represent ±SD. **P<0.01 and ***P<0.001.
Supplementary Fig. S4

Supplementary Fig. S4. The enrichment of Abca1 and Cyp7a1 mRNAs on HNRNPA2B1.

(A) RIP assays analyzed the enrichment of Abca1 and Cyp7a1 mRNAs on HNRNPA2B1 with overexpression of miR503HG in SMMC-7721 cells.

Supplementary Fig. S5

Supplementary Fig. S5. miR503HG mediates ubiquitination and degradation of HNRNPA2B1 in HCC cells

(A) Protein levels of HNRNPA2B1 in 11 HCC cell lines and normal liver cell L02. (B) mRNAs levels of HNRNPA2B1 in 67 pairs of HCC samples. (C) Correlation analysis
showed the relationship between miR503HG (x) and HNRNPA2B1 (y) in 67 HCC tissues. (D) HNRNPA2B1 mRNA expression level in HCC cells with overexpression and knockdown of miR503HG.

Supplementary Fig. S6

Supplementary Fig. S6. miR503HG inhibits the NF-κB signaling pathway in HCC cells

(A) The luciferase activity of different signaling pathways in HNRNPA2B1 silenced
HCC cells. (B) mRNA decay of p52 and p65 were affected by knockdown of HNRNPA2B1. The remaining transcript of p52 and p65 was measured in SMMC-7721 and Huh7 cells after treatment of actinomycin D (Act.D). (C) mRNA decay of p52 and p65 were affected by overexpression of miR503HG in HCC cells. (D) The phosphorylation levels of JAK2, STAT3, JNK, ERK1/2 after miR503HG knockdown. Data in C and D are the means ±SD. *P<0.05 and **P<0.01.

Supplementary Fig.S7

Supplementary Fig.S7. HNRNPA2B1 is required for miR503HG regulation of HCC cell migration and the NF-κB signaling pathway

(A) Migration assay of SMMC-7721 and Huh7 cells with knockdown of miR503HG and HNRNPA2B1. (B) The mRNA levels of p52 and p65 in SMMC-7721 and Huh7 cells that concomitantly knockdown of miR503HG and HNRNPA2B1. (C) Western blot analysis shows the expression changes of p52, p65 and the NF-κB downstream
genes in HNRNPA2B1 silenced HCC cells. (D) Relative luciferase activity of NF-κB in SMMC-7721 and Huh7 cells with knockdown of miR503HG and HNRNPA2B1.

Supplementary Fig.S8

Supplementary Fig.S8. miR503HG functions synergistically with miR503 to suppress HCC cell migration and invasion

(A) Expression of miR503 and miR503HG following knockdown of miR503HG in SMMC-7721 and Huh7 cells. (B) Expression of miR503 and miR503HG following inhibition of miR503 in HCC cells.

Supplementary Fig.S9

Supplementary Fig. S9. The prognostic significance of miR503HG in public database.

Online survival analysis software to assess the prognostic using microarray data of
miR503HG in breast cancer (A), lung cancer (B) and ovarian cancer (C).
Supplementary Table S1. Clinical pathological characteristics of 93 HCC patients in miR503HG expression analysis

| Characteristics                      | Case number | %   |
|--------------------------------------|-------------|-----|
| **Sex**                              |             |     |
| Female                               | 16          | 17.2|
| Male                                 | 77          | 82.8|
| **Age (years)**                      |             |     |
| ≤50                                  | 38          | 40.9|
| >50                                  | 55          | 59.1|
| **HBsAg**                            |             |     |
| Negative                             | 13          | 16.7|
| Positive                             | 65          | 83.3|
| **Cirrhosis**                        |             |     |
| No                                   | 15          | 16.1|
| Yes                                  | 78          | 83.9|
| **ALT(U/L)**                         |             |     |
| ≤75                                  | 76          | 89.4|
| >75                                  | 9           | 10.6|
| **AFP(ng/mL)**                       |             |     |
| ≤20                                  | 46          | 54.1|
| >20                                  | 39          | 45.9|
| **Tumor size (cm)**                  |             |     |
| ≤5                                   | 50          | 53.8|
| >5                                   | 43          | 46.2|
| **Tumor number**                     |             |     |
| Single                               | 71          | 76.3|
| Multiple                             | 22          | 23.7|
| **Tumor capsule**                    |             |     |
| None                                 | 36          | 39.6|
| Complete                             | 55          | 60.4|
| **Vascular invasion**                |             |     |
| No                                   | 71          | 76.3|
| Yes                                  | 22          | 23.7|
| **Lymphatic and distant metastasis** |             |     |
| No                                   | 73          | 78.5|
| Yes                                  | 20          | 21.5|
| **Tumor differentiation**            |             |     |
| I-II                                 | 71          | 78.0|
| III-IV                               | 20          | 22.0|
| **BCLC stage**                       |             |     |
| 0 and A                              | 15          | 16.1|
| B and C                              | 78          | 83.9|
| **TNM stage**                        |             |     |
| I-II                                 | 66          | 71.0|
| III-IV                               | 27          | 29.0|
Supplementary Table S2. Clinicopathological characteristics of 73 HCC patients in tissue microarray

| Characteristics               | Case number | %   |
|------------------------------|-------------|-----|
| Sex                          |             |     |
| Female                       | 11          | 15.1|
| Male                         | 62          | 84.9|
| Age (years)                  |             |     |
| ≤50                          | 36          | 49.3|
| >50                          | 37          | 50.7|
| HBsAg                        |             |     |
| Negative                     | 19          | 26.0|
| Positive                     | 54          | 74.0|
| Tumor size (cm)              |             |     |
| ≤5                           | 27          | 36.9|
| >5                           | 46          | 63.1|
| Tumor number                 |             |     |
| Single                       | 56          | 76.7|
| Multiple                     | 17          | 23.3|
| Vascular invasion            |             |     |
| No                           | 22          | 30.1|
| Yes                          | 51          | 69.9|
| Tumor differentiation        |             |     |
| I-II                         | 56          | 76.7|
| III-IV                       | 17          | 23.3|
| TNM stage                    |             |     |
| I-II                         | 54          | 73.9|
| III-IV                       | 19          | 26.7|
Supplementary Table S3. Differentially expressed lncRNAs in 12 pairs of HCC tissues and corresponding noncancerous liver tissues

| SEQ_ID    | Parametric p-value | FDR       | Geometric mean of intensities | up or down | Chromosome | Start    | End       | length | seqname          |
|-----------|--------------------|-----------|-------------------------------|------------|------------|----------|-----------|--------|-----------------|
| ASLNC03712 | 0.0000002          | 0.0000395 | 4.88                          | up         | chr1       | 148097375 | 148099328 | 1953   | uc001esz        |
| ASLNC06741 | 0.0000008          | 0.0000816 | 4.91                          | up         | chr6       | 26389261  | 26393741  | 4480   | uc003nhi        |
| ASLNC04019 | 0.0000045          | 0.000254  | 2.32                          | up         | chr1       | 113300593 | 113313119 | 12526  | uc001edd        |
| ASLNC22124 | 0.0000005          | 0.000276  | 2.73                          | up         | chr17      | 45813597  | 45829849  | 16252  | BC002250        |
| ASLNC20083 | 0.0000073          | 0.000346  | 3.71                          | up         | chr6       | 26237200  | 26240339  | 3139   | AK125133        |
| AK025108   | 0.0000087          | 0.000386  | 4.02                          | up         | chr1       | 223749141 | 223750974 | 1833   | HMlincRNA128    |
| ASLNC00740 | 0.0000107          | 0.000443  | 3.63                          | up         | chr2       | 234438826 | 234441794 | 2968   | NR_024322       |
| ASLNC17803 | 0.0000129          | 0.000499  | 2.65                          | up         | chr1       | 153467686 | 153470052 | 2366   | AK056250        |
| ASLNC01922 | 0.0000133          | 0.000509  | 3.68                          | up         | chr17      | 73721915  | 73732378  | 10463  | NR_002219       |
| ASLNC00686 | 0.0000197          | 0.00066   | 2.73                          | up         | chr2       | 111903360 | 111969163 | 65803  | NR_024373       |
| ASLNC15421 | 0.0000215          | 0.000701  | 2.99                          | up         | chr1       | 149822205 | 149822675 | 470    | AF086205        |
| ASLNC06583 | 0.0000242          | 0.000758  | 2.39                          | up         | chr6       | 34320941  | 34321986  | 1045   | uc001oe         |
| ASLNC00525 | 0.0000293          | 0.000844  | 2.43                          | up         | chr1       | 211096569 | 211098103 | 1534   | NR_027285       |
| AF519769   | 0.0000304          | 0.000861  | 3.72                          | up         | chr1       | 223749802 | 223907284 | 157482 | HMlincRNA128    |
| AB384549   | 0.0000318          | 0.000874  | 2.18                          | up         | chr5       | 5476026   | 5542440   | 66414  | chr5:5408092-5514014 |
| ASLNC03898 | 0.0000357          | 0.000938  | 2.13                          | up         | chr1       | 149936942 | 149937474 | 532    | uc001eq         |
| ASLNC18287 | 0.0000435          | 0.00106   | 2.53                          | up         | chr6       | 52637181  | 52641910  | 4729   | AK091117        |
| ASLNC04687 | 0.0000436          | 0.00106   | 2.56                          | up         | chr2       | 111681829 | 111969134 | 287305 | uc001tf         |
| ASLNC16894 | 0.0000553          | 0.00123   | 2.03                          | up         | chr2       | 111708775 | 111710938 | 2163   | AK023908        |
| ASLNC11688 | 0.0000574          | 0.00126   | 2.19                          | up         | chr17      | 75520737  | 75526872  | 6135   | uc002jxg        |
| ASLNC02773 | 0.0000622          | 0.00133   | 2.27                          | up         | chr1       | 172100017 | 172102809 | 2792   | HIV1915         |
| ASLNC24399 | 0.0000644          | 0.00135   | 2.48                          | up         | chr1       | 32426154  | 32434145  | 7991   | L15344          |
| ASLNC13494 | 0.0000662          | 0.00138   | 2.52                          | up         | chr1       | 222683621 | 222688175 | 4554   | AF130049        |
| Gene ID     | Log2FoldChange | p-value | q-value | Chromosome | Start | End   | Gene Symbol | Description |
|------------|---------------|---------|---------|------------|-------|--------|-------------|-------------|
| ASLNC24512 | 0.0000774     | 0.0153  | 3.33    | chr16      | 22980588 | 22981054 |             |             |
| ASLNC24250 | 0.0000846     | 0.0161  | 1.96    | chr1       | 148082688 | 148087215|             | BX648801    |
| ASLNC12514 | 0.0000854     | 0.0163  | 2.99    | chr19      | 63431881  | 63462971 |             | uc010eun    |
| ASLNC22486 | 0.0000884     | 0.0167  | 2.11    | chr20      | 13643623  | 13662388 |             | BC027981    |
| ASLNC10384 | 0.0001068     | 0.0194  | 4.66    | chr1       | 148097375 | 14812794 |             |             |
| ASLNC07321 | 0.000108      | 0.0202  | 2.1     | chr7       | 156124883 | 156126018|             |             |
| ASLNC19168 | 0.0001408     | 0.0287  | 2.33    | chr1       | 148097375 | 148099338|             |             |
| ASLNC20628 | 0.0001586     | 0.0297  | 2.14    | chr2       | 227382893 | 227386726|             |             |
| ASLNC11736 | 0.0001922     | 0.0329  | 2.37    | chr17      | 7110505   | 71125597 |             |             |
| ASLNC03876 | 0.0002002     | 0.0329  | 2.41    | chr3       | 12423345  | 12425917 |             |             |
| ASLNC12203 | 0.0002247     | 0.0311  | 2.56    | chr12      | 97432821  | 97467079 |             |             |
| ASLNC06832 | 0.000246      | 0.0322  | 2.33    | chr17      | 7110505   | 71125597 |             |             |
| ASLNC19106 | 0.0002803     | 0.0357  | 2.2     | chr3       | 148097375 | 148099338|             |             |
| ASLNC02384 | 0.0002859     | 0.0363  | 2.13    | chr8       | 141620279 | 141640998|             |             |
| ASLNC22143 | 0.0002941     | 0.0371  | 1.82    | chr17      | 36058299  | 36060354 |             |             |
| ASLNC02955 | 0.000302      | 0.0377  | 2.81    | chr5       | 138637718 | 138671116|             |             |
| ASLNC19042 | 0.0003183     | 0.0391  | 1.91    | chr1       | 19409475  | 19412794 |             |             |
| X65230     | 0.0003214     | 0.0392  | 2.61    | chr19      | 2847957   | 2887556 |             |             |
| ASLNC18240 | 0.0003398     | 0.0398  | 2.64    | chr1       | 62685089  | 62686631 |             |             |
| ASLNC01054 | 0.000369      | 0.0404  | 2.35    | chr6       | 52637157  | 52641910 |             |             |
| ASLNC19168 | 0.0003526     | 0.0417  | 2.16    | chr22      | 40557164  | 40560615 |             |             |
| ASLNC06771 | 0.0003618     | 0.0424  | 1.9     | chr6       | 33770034  | 33774412 |             |             |
| ASLNC22443 | 0.0003653     | 0.0426  | 1.88    | chr16      | 24985758  | 24987747 |             |             |
| GeneID   | Log2FoldChange | P.Value  | adj.P.Value | Chr | Start    | End      | Log2Expr1 | Log2Expr2 | Description |
|----------|----------------|----------|------------|-----|----------|----------|-----------|-----------|-------------|
| ASLNC03725 | 0.0003857     | 0.00445  | 2.32       | chr1 | 141960583| 142005271| 4.4688    | uc001ejf  |
| ASLNC12787 | 0.0003917     | 0.00448  | 2.13       | chr22 | 29695633 | 29699587 | 3.954     | uc003ajf  |
| ASLNC01516 | 0.0003984     | 0.00453  | 2.65       | chr12 | 119892023| 119894478| 2.455     | NR_024345 |
| ASLNC12455 | 0.0004066     | 0.0046   | 2.08       | chr20 | 25552680 | 25606706 | 5.4026    | uc002wuz  |
| ASLNC14032 | 0.0004096     | 0.00463  | 2.13       | chr13 | 112390083| 112392130| 2.047     | AK057085  |
| ASLNC15607 | 0.0004135     | 0.00469  | 2.21       | chr7  | 33020670 | 33027489 | 6.819     | AF090932  |
| ASLNC04867 | 0.0004185     | 0.00474  | 2.21       | chr2  | 170314742| 170316619| 1.877     | uc002ufj  |
| ASLNC19439 | 0.0004185     | 0.00474  | 2.56       | chr17 | 76839271 | 76840890 | 1.619     | AK098424  |
| ASLNC20394 | 0.0004235     | 0.00479  | 1.83       | chr2  | 42411888 | 42414128 | 2.240     | AK126362  |
| ASLNC09376 | 0.0004285     | 0.00484  | 1.87       | chr12 | 119413205| 119418111| 4.906     | uc001tyk  |
| ASLNC20446 | 0.0004335     | 0.00489  | 2.01       | chr19 | 4399806  | 4401833  | 2.027     | AK126579  |
| ASLNC00172 | 0.0004385     | 0.00494  | 2.85       | chr5  | 138671552| 138671812| 2.60      | uc.174-   |
| ASLNC15410 | 0.0004435     | 0.00499  | 1.98       | chr17 | 42371519 | 42372225 | 7.06      | AF086179  |
| EC579926   | 0.0004485     | 0.00504  | 2.1        | chr5  | 114876225| 114876280| 55        | HMrRNA764 |
| ASLNC12559 | 0.0004535     | 0.00509  | 2.56       | chr20 | 3815914  | 3817231  | 1.317     | uc002wjz  |
| ASLNC14901 | 0.0004585     | 0.00514  | 2.58       | chr17 | 59176346 | 59204638 | 2.8292    | AX810724  |
| ASLNC14700 | 0.0004635     | 0.00519  | 2.04       | chr2  | 95554884 | 95556177 | 1.593     | BC018776  |
| ASLNC15705 | 0.0004685     | 0.00524  | 1.97       | chr8  | 126438653| 126448544| 9.891     | AF147336  |
| ASLNC10710 | 0.0004735     | 0.00529  | 2.17       | chr15 | 41219610 | 41220757 | 1.147     | uc001zqz  |
| ASLNC15729 | 0.0004785     | 0.00534  | 2.15       | chr7  | 7646921  | 8066323  | 4.19402   | chr7:7895500-7963275 |
| ASLNC11492 | 0.0004835     | 0.00539  | 2.22       | chr17 | 24248975 | 24249914 | 9.39      | uc002hdf  |
| ASLNC07076 | 0.0004885     | 0.00544  | 1.77       | chr7  | 65633737 | 65657259 | 2.522     | uc010lad  |
| ASLNC07076 | 0.0004935     | 0.00549  | 1.95       | chr2  | 224425385| 224425606| 2.21      | chr2:224419425-224431400 |
| ASLNC07921 | 0.0005035     | 0.00554  | 3.01       | chr9  | 96357243 | 96370230 | 1.2987    | uc004aut  |
| T35622     | 0.0005085     | 0.00559  | 2.06       | chrX  | 62434977 | 62435244 | 2.67      | chrX:62428575-62446375 |
| Gene    | Start RefSeq | End RefSeq | Log2 Fold Change | P-value | Adjusted P-value | Chromosome | Start | End | Length |
|---------|--------------|------------|------------------|---------|------------------|------------|-------|-----|--------|
| ASLNC24021 | 0.0006834  | 0.00648  | 2.76             | up      | chr17            | 26884318   | 26885064 | 746  | BC131530 |
| ASLNC20619 | 0.0006907  | 0.00653  | 1.84             | up      | chr8             | 146003055  | 146023229 | 20174 | AK127225 |
| ASLNC05695 | 0.0006951  | 0.00656  | 1.93             | up      | chr4             | 55924896   | 55944320  | 19424 | uc003hav |
| ASLNC14537 | 0.0007558  | 0.00695  | 2.34             | up      | chrX             | 70385038   | 70388330  | 3292  | AY927569 |
| ASLNC18342 | 0.0007564  | 0.00695  | 2.3              | up      | chr10            | 45796347   | 457985030| 2887  | AK091544 |
| H72664    | 0.0007912  | 0.00718  | 2.56             | up      | chrX             | 172133219  | 172133782 | 563   | HMlincRNA111 |
| DB042414  | 0.0008088  | 0.0073   | 2.08             | up      | chr8             | 141738349  | 142080514 | 342165 | HMlincRNA565 |
| ASLNC01797| 0.0008248  | 0.00742  | 2.25             | up      | chr16            | 30838140   | 30842091  | 3951  | NR_024348 |
| ASLNC11574| 0.0008447  | 0.00756  | 2.07             | up      | chr22            | 48668094   | 48671071  | 2977  | AK022892 |
| ASLNC16733| 0.0008554  | 0.00764  | 2.29             | up      | chr2             | 11190365   | 111904956 | 1591  | uc010kfc |
| ASLNC21870| 0.0008683  | 0.00771  | 2.55             | up      | chr7             | 137830937  | 137919226 | 88289 | AL365456 |
| ASLNC13606| 0.0008737  | 0.00775  | 1.78             | up      | chr5             | 32472507   | 32472838  | 331   | BC063380 |
| AT700920  | 0.0008838  | 0.0078   | 1.94             | up      | chr12            | 28593261   | 28624143  | 30882 | chr12:28607450-28619725 |
| ASLNC01821| 0.0008871  | 0.00781  | 1.98             | up      | chr17            | 26082849   | 26109477  | 26628 | NR_024187 |
| ASLNC21970| 0.0008972  | 0.00788  | 2.66             | up      | chr9             | 138626301  | 138631454 | 5153  | AY129027 |
| ASLNC01554| 0.0009123  | 0.00798  | 2                | up      | chr12            | 6863405    | 6864027   | 622   | NR_002803 |
| AK127561  | 0.0009139  | 0.00798  | 2.68             | up      | chr1             | 223749804  | 223769722 | 19918 | HMlincRNA128 |
| ASLNC09859| 0.0009412  | 0.00816  | 1.76             | up      | chr13            | 43872387   | 43878021  | 5634  | uc001uazl |
| ASLNC14380| 0.0009711  | 0.00831  | 1.95             | up      | chr17            | 78154153   | 78155343  | 1190  | AL136830 |
| ASLNC24004| 0.0010305  | 0.0087   | 1.67             | up      | chr17            | 23724829   | 23725144  | 315   | BC128525 |
| ASLNC13500| 0.0011274  | 0.00927  | 2.07             | up      | chr17            | 55117194   | 55118452  | 1258  | AF130062 |
| ASLNC24076| 0.0011373  | 0.00934  | 2                | up      | chr13            | 97849540   | 97857747  | 8207  | BX537667 |
| ASLNC18105| 0.001145   | 0.00938  | 1.85             | up      | chr18            | 53484764   | 53486784  | 2020  | AK058035 |
| ASLNC19929| 0.0011755  | 0.00955  | 2.3              | up      | chr22            | 40553522   | 40558112  | 4590  | AK124515 |
| Gene ID   | Log2FoldChange | P.Value | q.Value | Start_pos | End_pos | Length | Chromosome | Start | End | Gene_id | Description |
|----------|----------------|---------|---------|-----------|---------|--------|------------|-------|-----|-------|-------------|
| ASLNC04817 | 0.0011765    | 0.00955 | 2.75    | chr2      | 242263829 | 242274900 | 11071 | uc002wca |
| ASLNC22072 | 0.0011789    | 0.00957 | 2.08    | chr1      | 35973178  | 35973419  | 241   | AY605064 |
| ASLNC22169 | 0.0011898    | 0.00964 | 1.81    | chr5      | 37322294  | 37323307  | 1013  | BC007784 |
| ASLNC14481 | 0.0012162    | 0.00973 | 2.07    | chr15     | 65119965  | 65127637  | 7672  | AY203937 |
| ASLNC22820 | 0.0012224    | 0.00977 | 2.12    | chr8      | 145991278 | 145992960 | 1682  | BC036118 |
| ASLNC12530 | 0.0012273    | 0.00985 | 2.03    | chr20     | 42279535  | 42285744  | 6209  | uc002xlo  |
| ASLNC08043 | 0.001241     | 0.00985 | 2.3     | chr9      | 35648873  | 35665863  | 16990 | uc003zxl  |
| ASLNC21947 | 0.0012601    | 0.00994 | 2.26    | chr2      | 95554443  | 95556197  | 1754  | AY010112 |
| ASLNC23093 | 0.0012795    | 0.01001 | 1.79    | chr3      | 144202439 | 144202999 | 560   | BC040051 |
| ASLNC09933 | 0.0013097    | 0.0102  | 1.77    | chr19     | 97851670  | 97857747  | 6077  | uc001vnl  |
| ASLNC13454 | 0.0013353    | 0.0105  | 1.85    | chr19     | 43801713  | 43819431  | 17718 | AF119846 |
| ASLNC14438 | 0.0013636    | 0.0106  | 2.21    | chr8      | 103907771 | 103945539 | 37768 | AL832582 |
| ASLNC16027 | 0.0014000    | 0.0108  | 1.78    | chr12     | 97467684  | 97468084  | 400   | AJ293393 |
| ASLNC18301 | 0.0014205    | 0.0109  | 1.97    | chr17     | 35337508  | 35340056  | 2548  | AK091224 |
| ASLNC01989 | 0.0014756    | 0.0112  | 2.13    | chr19     | 38485602  | 38487802  | 2200  | NR_026887 |
| ASLNC02328 | 0.0014993    | 0.0113  | 1.94    | chr16     | 3289661   | 3291406   | 1745  | ASO1713  |
| ASLNC07945 | 0.001503     | 0.0113  | 1.98    | chr9      | 135880409 | 135883044 | 2635  | uc004ceu  |
| AA810459   | 0.0016359    | 0.0121  | 2.09    | chr1      | 27399100  | 27399320  | 220   | HMlincRNA1153 |
| ASLNC11489 | 0.0016496    | 0.0121  | 2.52    | chr17     | 67578778  | 67623752  | 44974 | uc002jiu |
| ASLNC03708 | 0.0016616    | 0.0122  | 2.23    | chr1      | 153371887 | 153372755 | 868   | uc09wpd  |
| H79841     | 0.0016799    | 0.0123  | 2.56    | chrX      | 45796351  | 45803154  | 6803  | chrX:45782500-45808725 |
| ASLNC23059 | 0.001728     | 0.0126  | 1.82    | chr1      | 158261373 | 158263208 | 1835  | BC039426 |
| CR456823   | 0.0017297    | 0.0126  | 5.01    | chrX      | 49481769  | 49485199  | 3430  | HMlincRNA1588 |
| ASLNC17828 | 0.0018406    | 0.0132  | 2.11    | chr8      | 43101049  | 43105062  | 4013  | AK056481 |
| ASLNC10535 | 0.001891     | 0.0134  | 2.56    | chr15     | 61987486  | 62125574  | 138088 | uc002ams  |
| ASLNC00528 | 0.0018941    | 0.0135  | 2.1     | chr1      | 218506143 | 218507680 | 1537  | NR_001587 |
| ASLNC05852 | 0.0019897 | 0.014 | 1.85 | up | chr5 | 153809720 | 153812118 | 2398 | uc003lvl |
| ASLNC20579 | 0.0020646 | 0.0144 | 2.06 | up | chr7 | 99649215 | 99653093 | 3878 | AK127069 |
| ASLNC02120 | 0.0020694 | 0.0145 | 2.07 | up | chr21 | 46473585 | 46496032 | 22447 | NR_002776 |
| ASLNC00996 | 0.0021084 | 0.0145 | 2.07 | up | chr6 | 58354117 | 58395683 | 41566 | NR_003660 |
| CB163005 | 0.0021174 | 0.0147 | 1.92 | up | chr1 | 172138110 | 172138620 | 510 | HMlincRNA111 |
| ASLNC13166 | 0.0021174 | 0.0147 | 2.16 | up | chrX | 79813827 | 79816373 | 2546 | uc004edn |
| ASLNC03647 | 0.0021174 | 0.0147 | 1.81 | up | chr1 | 116744749 | 116762726 | 17977 | uc009whc |
| ASLNC20144 | 0.0021986 | 0.015 | 2.29 | up | chr2 | 216790012 | 216793158 | 3146 | AK125369 |
| ASLNC00996 | 0.002201 | 0.015 | 1.76 | up | chr13 | 40855880 | 40856778 | 898 | HMlincRNA506 |
| AL579364 | 0.0022201 | 0.015 | 2.1 | up | chr3 | 195791087 | 195792276 | 1188 | uc003fug |
| ASLNC04982 | 0.0022343 | 0.0151 | 2.1 | up | chr10 | 34438814 | 34439996 | 1182 | uc001ixf |
| ASLNC08806 | 0.0022577 | 0.0153 | 1.87 | up | chr70 | 45729914 | 45775142 | 45228 | NR_024271 |
| ASLNC06474 | 0.0022604 | 0.0159 | 2.48 | up | chr17 | 242242587 | 242263831 | 2371 | uc002wcb |
| BU682041 | 0.0022971 | 0.0169 | 2 | up | chrX | 62432470 | 62434507 | 237 | chrX:62428575-62446375 |
| BT009824 | 0.0022971 | 0.0169 | 1.79 | up | chr3 | 26653413 | 26653684 | 271 | HMlincRNA372 |
| ASLNC02364 | 0.0023711 | 0.0175 | 1.97 | up | chr17 | 24248981 | 24249914 | 933 | ASO1973 |
| ASLNC03746 | 0.0024805 | 0.0179 | 2.21 | up | chr1 | 141746421 | 141832193 | 85772 | uc001edj |
| ASLNC13459 | 0.0025837 | 0.018 | 2.05 | up | chr12 | 111429974 | 111430837 | 863 | AF19855 |
| ASLNC18153 | 0.0028026 | 0.0189 | 1.75 | up | chr8 | 96068284 | 96070570 | 2286 | AK074467 |
| ASLNC04593 | 0.0030169 | 0.0195 | 1.83 | up | chr2 | 3584012 | 3587197 | 3185 | uc002qyu |
| ASLNC20127 | 0.0031833 | 0.0196 | 1.77 | up | chr7 | 5432441 | 5435084 | 2643 | AK125308 |
| ASLNC16715 | 0.0034323 | 0.0208 | 1.81 | up | chr1 | 10439963 | 10442209 | 2246 | AK022602 |
| DW407854 | 0.0035336 | 0.0213 | 2.47 | up | chr5 | 180610475 | 180610914 | 439 | HMlincRNA239 |
| ASLNC08553 | 0.0036066 | 0.0217 | 1.85 | up | chr10 | 81957445 | 81969392 | 11947 | uc001kbv |
| ASLNC06183 | 0.0036279 | 0.0217 | 1.94 | up | chr5 | 157115457 | 157120295 | 4838 | uc003xf |
| ASLNC12125 | 0.0036482 | 0.0218 | 2.38 | up | chr19 | 41495808 | 41514450 | 18642 | uc002dtt |
| Gene       | ENSG_ID   | NAME       | Dist  | Expression | Chromosome | Start  | End    | Length | Average Coverage | Standard Deviation | Log2 Fold Change | P-Value  |
|------------|-----------|------------|-------|------------|------------|--------|--------|--------|-----------------|--------------------|-----------------|----------|
| BF327102   | 0.0036494 | 0.0218     | 1.91  | up         | chr1       | 191493784 | 191494007 | 223    | chr1:191490425-191504575 |
| ASLNC21946 | 0.0036497 | 0.0218     | 1.94  | up         | chr8       | 11697706  | 11733819 | 36113  | AY007159         |                    |                 |          |
| ASLNC04509 | 0.0036777 | 0.0219     | 1.76  | up         | chr2       | 110578524 | 110627280 | 48756  | uc002f6         |                    |                 |          |
| ASLNC11193 | 0.0036782 | 0.0219     | 2.05  | up         | chr16      | 88696195  | 88731900 | 35705  | uc002fqr         |                    |                 |          |
| exon3717   | 0.0037519 | 0.0223     | 2.02  | up         | chr7       | 25954785  | 25955047 | 262    | chr7:25945000-25956500 |                    |                 |          |
| ASLNC18707 | 0.0037717 | 0.0223     | 1.84  | up         | chr20      | 56994136  | 56995891 | 1755   | AK094347         |                    |                 |          |
| ASLNC01245 | 0.003795  | 0.0224     | 2.11  | up         | chr8       | 135679495 | 135682114 | 2619   | NR_002438        |                    |                 |          |
| ASLNC12337 | 0.0039348 | 0.023     | 1.86  | up         | chr20      | 48342663  | 48364863 | 22200  | uc002xvk         |                    |                 |          |
| ASLNC11977 | 0.004027  | 0.0234     | 1.75  | up         | chr19      | 53995049  | 54005985 | 10936  | uc010emj         |                    |                 |          |
| ASLNC15627 | 0.0040591 | 0.0235     | 1.83  | up         | chr2       | 96624476  | 96624897 | 421    | AF117338         |                    |                 |          |
| ASLNC01726 | 0.0040729 | 0.0236     | 1.84  | up         | chr15      | 66883213  | 66886494 | 3281   | NR_026808        |                    |                 |          |
| ASLNC20139 | 0.0040997 | 0.0237     | 1.74  | up         | chr11      | 62098221  | 62101634 | 3413   | AK125351         |                    |                 |          |
| ASLNC23502 | 0.0041532 | 0.0239     | 1.7   | up         | chr19      | 63206069  | 63209588 | 3519   | BC044949         |                    |                 |          |
| ASLNC03093 | 0.0044559 | 0.0252     | 1.83  | up         | chr12      | 68634339  | 6864025 | 586    | LIT2101          |                    |                 |          |
| ASLNC02135 | 0.0046717 | 0.026     | 1.83  | up         | chr21      | 45532394  | 45541696 | 9302   | NR_026943        |                    |                 |          |
| ASLNC16210 | 0.0047112 | 0.0261     | 2.04  | up         | chr2       | 111682070 | 111686182 | 4112   | AK001796         |                    |                 |          |
| DB038427   | 0.0048027 | 0.0265     | 2.61  | up         | chr19      | 35205041  | 35221068 | 527    | chr19:35205200-35223675 |                    |                 |          |
| CD671102   | 0.0049663 | 0.0273     | 1.85  | up         | chr19      | 35220020  | 35220481 | 461    | chr19:35205200-35223675 |                    |                 |          |
| ASLNC10490 | 0.0049906 | 0.0274     | 1.67  | up         | chr15      | 80938884  | 80979983 | 41099  | uc002bii         |                    |                 |          |
| ASLNC10890 | 0.0050903 | 0.0278     | 2.04  | up         | chr16      | 21382377  | 21439266 | 56889  | uc002dja         |                    |                 |          |
| CD514437   | 0.0053894 | 0.0289     | 1.7   | up         | chr2       | 224425408 | 224426120 | 712    | chr2:224419425-224431400 |                    |                 |          |
| L43964     | 0.0053899 | 0.0289     | 1.85  | up         | chr1       | 225125582 | 225150420 | 24838  | HMlincRNA124     |                    |                 |          |
| ASLNC03240 | 0.0055111 | 0.0293     | 2.06  | up         | chr1       | 6720      | 9622    | 2902   | uc001aai         |                    |                 |          |
| ASLNC13627 | 0.0056568 | 0.0298     | 1.72  | up         | chr12      | 119049555 | 119060589 | 11134  | BC080184         |                    |                 |          |
| ASLNC14854 | 0.0057664 | 0.0302     | 2.12  | up         | chr8       | 81562019  | 81574632 | 12613  | AX721121         |                    |                 |          |
| ASLNC21307 | 0.0058075 | 0.0303     | 1.83  | up         | chr7       | 72661527  | 72663768 | 2241   | AK130335         |                    |                 |          |
| Gene Symbol | Log2 Fold Change | p-value | q-value | Chromosome | Start | End | Length | Annotation |
|-------------|------------------|---------|---------|-------------|-------|-----|--------|------------|
| ASLNC20031  | 0.0062708        | 0.0321  | 1.79    | chr20       | 39457481 | 39467547 | 10066   | AK124874   |
| BM012363    | 0.0063788        | 0.0325  | 1.63    | chrX        | 62435948 | 62436164  | 216     | chrX:62428575-62446375 |
| ASLNC00597  | 0.0064153        | 0.0325  | 1.7     | chr1        | 116748858 | 116762728 | 13870   | NR_024125 |
| BE891694    | 0.0064172        | 0.0325  | 1.7     | chr5        | 180606185 | 180606718 | 533     | HMlincRNA239 |
| AK127627    | 0.0064863        | 0.0325  | 2.16    | chr18       | 10721473  | 10763583  | 42110   | HMlincRNA783 |
| ASLNC01405  | 0.0065041        | 0.0329  | 1.91    | chr10       | 27574787  | 27581241  | 6454    | NR_003525 |
| ASLNC19038  | 0.0067495        | 0.0329  | 1.91    | chr11       | 176960063 | 176962043 | 1980    | AK096082 |
| ASLNC07038  | 0.0070307        | 0.0349  | 1.72    | chr7        | 100647704 | 100654191 | 6487    | uc003uyf |
| AD016153    | 0.0070737        | 0.035   | 2.24    | chr8        | 57124793  | 57125003  | 210     | HMlincRNA1074 |
| ASLNC04882  | 0.0071739        | 0.0355  | 1.9     | chr2        | 114067712 | 114070625 | 2913    | uc002tke |
| ASLNC03682  | 0.0072045        | 0.0356  | 1.69    | chr1        | 151882577 | 151885399 | 2822    | uc001fcp |
| ASLNC10703  | 0.0075039        | 0.0367  | 1.78    | chr15       | 27754485  | 27758659  | 4174    | uc001zcp |
| ASLNC01531  | 0.0075425        | 0.0367  | 1.87    | chr12       | 99081164  | 99091466  | 10302   | NR_024261 |
| ASLNC10972  | 0.0075591        | 0.0368  | 1.84    | chr16       | 23393725  | 23429309  | 35584   | uc010bxa |
| BG222385    | 0.0075792        | 0.0369  | 1.72    | chr1        | 159375599 | 159375980 | 381     | HMlincRNA121 |
| ASLNC17882  | 0.0076188        | 0.0371  | 2.76    | chr9        | 84784324  | 84787171  | 2847    | AK056882 |
| W20127      | 0.0076378        | 0.0371  | 1.9     | chr2        | 127031469 | 127032121 | 652     | chr2:127007450-127034900 |
| U90549      | 0.0077254        | 0.0374  | 1.95    | chr6        | 26652732  | 26654703  | 1971    | HMlincRNA372 |
| ASLNC15880  | 0.0078535        | 0.0378  | 1.75    | chr13       | 97905675  | 97914040  | 8365    | AF339785 |
| ASLNC20130  | 0.0079215        | 0.0381  | 1.79    | chr6        | 3176635   | 3216068   | 39433   | AK125314 |
| ASLNC20415  | 0.0079273        | 0.0381  | 1.86    | chr9        | 134553682 | 134556099 | 2327    | AK126436 |
| ASLNC24207  | 0.0079349        | 0.0381  | 1.78    | chr19       | 45553588  | 45558327  | 4739    | BX648310 |
| ASLNC15595  | 0.0079402        | 0.0381  | 1.86    | chr15       | 48786797  | 48828242  | 41445   | AF090911 |
| ASLNC16402  | 0.0081631        | 0.039   | 1.66    | chr17       | 56818956  | 56820626  | 1670    | AK021817 |
| ASLNC21792  | 0.0081646        | 0.039   | 1.7     | chr2        | 152051036 | 152062973 | 11937   | AL137363 |
| ASLNC05554  | 0.0081992        | 0.039   | 1.8     | chr4        | 689572    | 718816    | 29244   | uc003gbc |
| gene_id     | log2FoldChange | P.Value | q.Value | up/down | chromosome | start_position | end_position | distance | feature_id |
|-------------|----------------|---------|---------|---------|------------|----------------|--------------|----------|------------|
| ASLNC06007 | 0.0084449      | 0.04    |         | up      | chr5       | 126408949      | 126437071    | 28122    | uc003kug   |
| ASLNC23199 | 0.0086115      | 0.0405  |         | up      | chr17      | 37258298       | 37260848     | 2550     | BC040976   |
| CR379777   | 0.0086191      | 0.0406  |         | up      | chr2       | 127031291      | 127031786    | 495      | chr2:127007450-127034900 |
| ASLNC14843 | 0.0086337      | 0.0406  |         | up      | chr6       | 43105778       | 43106773     | 995      | BC039515   |
| ASLNC15956 | 0.0087566      | 0.0411  |         | up      | chr16      | 23490680       | 23491100     | 420      | AJ001827   |
| ASLNC08375 | 0.0087985      | 0.0412  |         | up      | chr10      | 133631176      | 133633859    | 2683     | uc001lkf   |
| ASLNC20159 | 0.0088909      | 0.0415  |         | up      | chr3       | 33407598       | 33409958     | 2360     | AK125415   |
| ASLNC07067 | 0.0090677      | 0.0421  |         | up      | chr7       | 104541702      | 104542701    | 999      | uc003vc    |
| ASLNC14889 | 0.0091727      | 0.0425  |         | up      | chrX       | 62435948       | 62436157     | 209      | chrX:62428575-62446375 |
| ASLNC18219 | 0.0091754      | 0.0425  |         | up      | chr8       | 37835624       | 37837865     | 2241     | AK090578   |
| ASLNC13431 | 0.0093261      | 0.043   |         | up      | chr8       | 124095373      | 124096405    | 1032     | AF116708   |
| ASLNC06258 | 0.0094729      | 0.0436  |         | up      | chr5       | 43157398       | 43212103     | 54705    | uc003jnl   |
| BG334695   | 0.0095193      | 0.0437  |         | up      | chr5       | 180608194      | 180608936    | 742      | HMlincRNA239 |
| ASLNC23476 | 0.0095692      | 0.0438  |         | up      | chr2       | 37355557       | 37358871     | 3314     | BC043642   |
| ASLNC00653 | 0.0097633      | 0.0445  |         | up      | chr2       | 110013297      | 110083422    | 70125    | NR_027145  |
| ASLNC13065 | 0.0099224      | 0.045   |         | up      | chrX       | 151646635      | 151653828    | 7193     | uc004fgb   |
| ASLNC24492 | 0.0099683      | 0.0451  |         | up      | chr7       | 154386313      | 154391474    | 5161     | U23862     |
| ASLNC02087 | 0.0099837      | 0.0451  |         | up      | chr20      | 28225539       | 28247668     | 22129    | NR_003579  |
| CB854497   | 0.0100156      | 0.0453  |         | up      | chr2       | 224420706      | 224421381    | 675      | chr2:224419425-224431400 |
| ASLNC16942 | 0.0103166      | 0.0462  |         | up      | chr8       | 22553828       | 22556620     | 1792     | AK024169   |
| CV312899   | 0.0104058      | 0.0465  |         | up      | chr12      | 9170879        | 9171225      | 346      | chr12:9168650-9183575 |
| ASLNC14889 | 0.0104475      | 0.0466  |         | up      | chr17      | 24248927       | 24249283     | 356      | AX795353   |
| ASLNC19304 | 0.0105237      | 0.0469  |         | up      | chr1       | 16660929       | 16667563     | 7534     | AK097742   |
| ASLNC04233 | 0.010581       | 0.0471  |         | up      | chr2       | 110051207      | 110099956    | 48749    | uc010fr    |
| AK225978   | 0.0107212      | 0.0476  |         | up      | chr5       | 150612877      | 150985719    | 372842   | chr5:150980275-150993600 |
| ASLNC08290 | 0.0108497      | 0.048   |         | up      | chr9       | 67925645       | 67944120     | 18475    | uc004aey   |
| Gene Symbol   | Log2 Fold Change | p-value | Cytogenetic Location | Region | Gene Name |
|--------------|-----------------|---------|----------------------|--------|-----------|
| ASLNC02665  | 0.0108514       | 0.048   | 2.38                 | up     | chr1      |
| ASLNC01731  | 0.0109512       | 0.0482  | 2.05                 | up     | chr15     |
| ASLNC07073  | 0.0110315       | 0.0485  | 1.79                 | up     | chr7      |
| ASLNC09658  | 0.0112151       | 0.049   | 1.61                 | up     | chr12     |
| ASLNC03650  | 0.0112725       | 0.0491  | 1.55                 | up     | chr1      |
| ASLNC20473  | 0.011305        | 0.0492  | 1.72                 | up     | chr10     |
| BF373573    | 0.0114363       | 0.0497  | 1.77                 | up     | chr2      |
| DB445318    | 0.01114675      | 0.0498  | 1.95                 | up     | chr7      |
| ASLNC21672  | 0.011509        | 0.05    | 1.55                 | up     | chr10     |
| ASLNC19402  | 0.0115371       | 0.05    | 1.69                 | up     | chr17     |
| ASLNC04751  | 0.0115695       | 0.0501  | 1.69                 | up     | chr2      |
| ASLNC19006  | 0.0116169       | 0.0503  | 1.6                  | up     | chr9      |
| ASLNC12170  | 0.0116684       | 0.0504  | 1.85                 | up     | chr19     |
| ASLNC11994  | 0.0117534       | 0.0506  | 2.08                 | up     | chr19     |
| ASLNC10528  | 0.0118073       | 0.0508  | 1.75                 | up     | chr15     |
| ASLNC17209  | 0.0123829       | 0.0526  | 1.7                  | up     | chr19     |
| AA090784    | 0.0124122       | 0.0527  | 1.98                 | up     | chr5      |
| ASLNC02679  | 0.0127406       | 0.0538  | 1.71                 | up     | chr20     |
| ASLNC24264  | 0.0129198       | 0.0543  | 1.66                 | up     | chr9      |
| BG290174    | 0.0129668       | 0.0545  | 1.72                 | up     | chr5      |
| ASLNC17535  | 0.0131418       | 0.0551  | 1.76                 | up     | chr17     |
| ASLNC04489  | 0.0131567       | 0.0551  | 1.71                 | up     | chr2      |
| ASLNC10573  | 0.0131754       | 0.0551  | 1.5                  | up     | chr15     |
| ASLNC09118  | 0.0131822       | 0.0551  | 1.63                 | up     | chr11     |
| ASLNC21447  | 0.0132521       | 0.0553  | 1.86                 | up     | chr3      |
| ASLNC05947  | 0.0134212       | 0.0558  | 1.64                 | up     | chr5      |
| Gene     | ENSG | Fold Change | State | Chromosome | Position | Log2 Ratio | Log2 FDR | p Value | GO Terms |
|----------|------|-------------|-------|------------|----------|------------|----------|---------|----------|
| ASLNC01541 | 0.0135086 | 0.0561 | 1.67 | up | chr12 | 110761955 | 110765089 | 3134 | NR_015404 |
| AA723978  | 0.0136436 | 0.0565 | 1.69 | up | chr10 | 75056040 | 75056328 | 288 | HMlincRNA460 |
| AA584732  | 0.0137848 | 0.0569 | 1.62 | up | chr1 | 142369409 | 142369832 | 423 | chr1:142366925-142378900 |
| DA642269  | 0.0138847 | 0.0572 | 1.9 | up | chr1 | 172137815 | 172138397 | 582 | HMlincRNA111 |
| ASLNC01500 | 0.0139262 | 0.0573 | 1.88 | up | chr11 | 33054271 | 33057575 | 3304 | NR_015451 |
| ASLNC01233 | 0.0141126 | 0.0578 | 1.69 | up | chr8 | 94821514 | 94822223 | 709 | NR_027259 |
| ASLNC01941 | 0.0142227 | 0.0581 | 1.65 | up | chr18 | 5226723 | 5228028 | 1305 | NR_026849 |
| ASLNC11682 | 0.0145016 | 0.0589 | 1.71 | up | chr17 | 63640936 | 63643663 | 2727 | uc002jqq |
| ASLNC01384 | 0.0145932 | 0.059 | 1.75 | up | chr10 | 1058576 | 1080141 | 21565 | NR_024628 |
| ASLNC18310 | 0.0146171 | 0.0591 | 1.72 | up | chr1 | 11971064 | 11974240 | 3176 | AK091277 |
| ASLNC08674 | 0.0146978 | 0.0592 | 1.85 | up | chr10 | 120890414 | 120915194 | 24780 | uc001leu |
| AK294833 | 0.0147557 | 0.0594 | 1.66 | up | chr18 | 30812261 | 30974615 | 162354 | chr18:30822250-30849925 |
| ASLNC14433 | 0.0147722 | 0.0594 | 1.71 | up | chr9 | 138737483 | 138738984 | 1501 | AL832531 |
| ASLNC03813 | 0.0148435 | 0.0596 | 1.75 | up | chr1 | 153863170 | 153884959 | 21789 | uc001flf |
| BX448694 | 0.0152824 | 0.0609 | 1.98 | up | chr1 | 27399152 | 27399424 | 272 | HMlincRNA1153 |
| AF289584 | 0.0154234 | 0.0613 | 2.72 | up | chr16 | 48926548 | 49225628 | 299080 | chr16:49113275-49131950 |
| ASLNC05169 | 0.0155165 | 0.0615 | 1.59 | up | chr3 | 13058906 | 130592127 | 2621 | uc003emc |
| ASLNC13672 | 0.0156263 | 0.0618 | 1.64 | up | chr6 | 91280020 | 91284180 | 4160 | BX648277 |
| ASLNC15760 | 0.0156365 | 0.0618 | 1.85 | up | chr2 | 24152164 | 24152683 | 519 | AF147425 |
| ASLNC07346 | 0.015864 | 0.0624 | 1.83 | up | chr7 | 44005125 | 44025294 | 20169 | uc003te |
| ASLNC14879 | 0.0162409 | 0.0635 | 1.65 | up | chr10 | 34689054 | 34706966 | 17912 | AX765710 |
| ASLNC15179 | 0.0168733 | 0.0652 | 1.71 | up | chr11 | 76171270 | 76171896 | 626 | AF074986 |
| BQ226790 | 0.016896 | 0.0652 | 1.74 | up | chr11 | 74014197 | 74057829 | 43632 | HMlincRNA1402 |
| ASLNC00615 | 0.0169588 | 0.0653 | 2.02 | up | chr1 | 47670392 | 47672900 | 2508 | NR_026878 |
| EG328602 | 0.0175178 | 0.0667 | 1.92 | up | chr12 | 9170930 | 9171457 | 527 | chr12:9168650-9183575 |
| CN346112 | 0.0178917 | 0.0679 | 1.66 | up | chr15 | 46804626 | 46805301 | 675 | chr15:46800350-46810550 |
| Gene ID   | Log2FoldChange | p-value  | q-value | Chromosome | Start | End   | Database        | Description               |
|-----------|----------------|----------|---------|------------|-------|-------|----------------|---------------------------|
| R09394    | 0.0179095      | 0.0679   | 2.35    | chrX       | 62434803 | 62435106 | 303            | chrX:62428575-62446375    |
| AI863265  | 0.0180805      | 0.0682   | 1.83    | chr1       | 47684457 | 47684947 | 490            | HMlincRNA1126             |
| ASLNC03697| 0.0182146      | 0.0685   | 1.96    | chr1       | 153284316| 153290265| 5949           | uc001fgo                 |
| ASLNC22112| 0.0182492      | 0.0686   | 1.94    | chr10      | 101938113| 101979284| 41171          | AY952888                 |
| ASLNC00630| 0.0184278      | 0.0693   | 1.77    | chr5       | 133765762| 133775471| 9799           | AK057925                 |
| BQ333288  | 0.0196663      | 0.0726   | 1.95    | chr13      | 40856529 | 40856755 | 226            | HMlincRNA506             |
| ASLNC02676| 0.020296       | 0.0746   | 1.52    | chr5_h2_hap1| 633471  | 633839  | 368            | HIV1505                  |
| ASLNC18862| 0.0203094      | 0.0746   | 1.62    | chr3       | 53868059 | 53870643 | 2584           | AK095091                 |
| ASLNC11484| 0.0206416      | 0.0753   | 1.66    | chr17      | 43331150 | 43350937 | 19787          | uc002imm                 |
| ASLNC03460| 0.0207064      | 0.0753   | 1.74    | chr1       | 245005937| 245023308| 16371          | uc001lbs                 |
| DA418630  | 0.0208999      | 0.0758   | 1.72    | chr1       | 89871286 | 90171397 | 300111         | HMlincRNA1212            |
| AW140084  | 0.0209287      | 0.0758   | 1.82    | chr4       | 185634988| 185635452| 464            | HMlincRNA1448            |
| ASLNC19501| 0.0209968      | 0.076    | 1.98    | chr7       | 13383187 | 133832614| 1427           | AK098800                 |
| ASLNC14036| 0.0212657      | 0.0766   | 1.6     | chr1       | 24737878 | 24755102 | 17224          | CR613961                 |
| ASLNC19906| 0.0215376      | 0.0774   | 1.62    | chr3       | 12600273 | 12602296 | 2023           | AK124449                 |
| DB280069  | 0.0226468      | 0.0804   | 1.6     | chr20      | 1540216  | 1626427  | 86211          | chr20:1594825-1615675    |
| ASLNC15182| 0.0227767      | 0.0808   | 1.48    | chr3       | 50609969 | 50601480 | 511            | AFO74992                 |
| CB047103  | 0.0228804      | 0.0811   | 1.85    | chr1       | 172138039| 172138668| 629            | HMlincRNA111             |
| ASLNC19589| 0.0229089      | 0.0812   | 1.61    | chr10      | 42331620 | 42334041 | 2421           | AK123297                 |
| ASLNC09081| 0.0230442      | 0.0815   | 1.62    | chr11      | 46359878 | 46361951 | 2073           | uc001ncr                 |
| ASLNC12996| 0.023362       | 0.0821   | 1.98    | chr22      | 23157818 | 23158694 | 876            | uc010gun                 |
| BF434328  | 0.0234471      | 0.0822   | 1.8     | chr10      | 123677865| 123701060| 23195          | HMlincRNA1420            |
| ASLNC18698| 0.0239772      | 0.0834   | 1.71    | chr4       | 990075   | 992136   | 2061           | AK094314                 |
| ASLNC00968| 0.0239962      | 0.0834   | 1.61    | chr6       | 2933199  | 2936403  | 3204           | NR_026855                |
| ASLNC14903| 0.0242507      | 0.0841   | 1.58    | chr5       | 115194157| 115194950| 793            | AB002439                 |
| ASLNC          | Start  | End          | Log2 FC | Log2 Ratio | Fold Change | chr  | Start Coordinates | End Coordinates | Description |
|---------------|--------|--------------|---------|------------|-------------|------|--------------------|-----------------|-------------|
| ASLNC08309    | 0.0243177 | 0.0843       | 1.79    | up         | chr9        | 68659885 | 68664815            | 4930            | uc010mrv    |
| ASLNC19055    | 0.0243366 | 0.0843       | 1.81    | up         | chr8        | 141599437 | 141601721           | 2284            | AK096164    |
| ASLNC07271    | 0.0244352 | 0.0845       | 1.51    | up         | chr7        | 44588548 | 44589795            | 1247            | uc003fl    |
| ASLNC05081    | 0.0246785 | 0.0853       | 1.89    | up         | chr3        | 14959297 | 14960929            | 1632            | uc003bze    |
| ASLNC16522    | 0.024731  | 0.0853       | 1.56    | up         | chr6        | 88149335 | 88152306            | 2971            | AK022079    |
| ASLNC15986    | 0.0247889 | 0.0854       | 1.64    | up         | chr11       | 227040   | 242981              | 15941           | AJ012504    |
| ASLNC01678    | 0.0247934 | 0.0854       | 1.68    | up         | chr15       | 39363492 | 39379086            | 15594           | NR_026757   |
| ASLNC15663    | 0.0252547 | 0.0864       | 1.82    | up         | chr6        | 7485688  | 7486557             | 869             | AF143325    |
| ASLNC07308    | 0.0259395 | 0.0882       | 1.77    | up         | chr7        | 55808365 | 55808868            | 503             | uc003ty     |
| ASLNC19257    | 0.0259836 | 0.0884       | 1.54    | up         | chr7        | 128382385 | 128384345          | 1960            | AK097374    |
| ASLNC16735    | 0.0263266 | 0.0892       | 1.57    | up         | chr20       | 340551   | 342561              | 2010            | AK022947    |
| ASLNC16798    | 0.0263398 | 0.0892       | 1.61    | up         | chr12       | 123829632 | 123832395          | 2763            | AK023485    |
| ASLNC21995    | 0.0263422 | 0.0892       | 1.7     | up         | chr6        | 144212978 | 144220604          | 7626            | AY326463    |
| AA376978      | 0.0270018 | 0.0908       | 1.7     | up         | chr1        | 172138117 | 172138390          | 273             | HMlincRNA111 |
| ASLNC23971    | 0.027054  | 0.0909       | 1.54    | up         | chr19       | 4529454  | 45429820            | 366             | BC127856    |
| ASLNC02367    | 0.0271896 | 0.0913       | 1.73    | up         | chr17       | 24240978 | 24249797            | 719             | ASO1977     |
| ASLNC11943    | 0.0272719 | 0.0915       | 1.52    | up         | chr19       | 42364321 | 42366760            | 2439            | uc0020fp    |
| ASLNC16414    | 0.0272927 | 0.0915       | 1.72    | up         | chr6        | 90598864 | 90600520            | 1656            | AK021848    |
| ASLNC11197    | 0.0273741 | 0.0916       | 1.84    | up         | chr16       | 88746682 | 88754873            | 8191            | uc010cji    |
| ASLNC13527    | 0.027431  | 0.0917       | 1.96    | up         | chr14       | 88692289 | 88694766            | 2477            | AF138661    |
| CF126280      | 0.0275041 | 0.0919       | 1.85    | up         | chr5        | 180061646 | 180616851          | 10705           | HMlincRNA239 |
| DB447077      | 0.0276603 | 0.0922       | 1.62    | up         | chr7        | 7646939  | 8028666            | 381727          | chr7:7895500-7963275 |
| ASLNC00510    | 0.0276984 | 0.0923       | 1.62    | up         | chr1        | 22224293 | 22230302            | 6009            | NR_023918   |
| CD358392      | 0.0278104 | 0.0925       | 1.66    | up         | chr2        | 127031468 | 127032311          | 843             | chr2:127007450-127034900 |
| ASLNC07902    | 0.0278745 | 0.0926       | 1.57    | up         | chr9        | 68116304 | 68138190            | 21886           | uc004aez    |
| ASLNC19477    | 0.0279034 | 0.0927       | 1.53    | up         | chr2        | 96844694 | 96846030            | 1336            | AK098629    |
| Gene      | Start    | End      | Length | Type | Chromosome | Start Gene | End Gene | Length Gene | Start 1   | End 1     | Length 1   | Start 2   | End 2     | Length 2   | Start 3   | End 3     | Length 3   |
|-----------|----------|----------|--------|------|------------|------------|----------|-------------|------------|-----------|------------|------------|-----------|------------|------------|-----------|------------|------------|
| ASLNC04983 | 0.028136 | 0.0934   | 1.52   | up   | chr3       | 198855914  | 198857282 | 1368        | uc010iahq  |           |            |            |           |           |            |           |            |            |
| ASLNC14534 | 0.0287229 | 0.0948   | 1.69   | up   | chrX      | 106106500  | 106123233 | 16733       | AY927564   |           |            |            |           |           |            |           |            |            |
| ASLNC17699 | 0.0288318 | 0.095    | 1.62   | up   | chr4      | 763994     | 765636    | 1642        | AK055583   |           |            |            |           |           |            |           |            |            |
| ASLNC17218 | 0.0300799 | 0.0978   | 1.62   | up   | chr1      | 90096389   | 90098903  | 2514        | AK025238   |           |            |            |           |           |            |           |            |            |
| ASLNC22208 | 0.0301056 | 0.0979   | 1.57   | up   | chr7      | 137923421  | 137924644 | 1223        | BC009590   |           |            |            |           |           |            |           |            |            |
| ASLNC06232 | 0.0308361 | 0.0996   | 1.71   | up   | chr5      | 80569139   | 80633134  | 63995       | uc003khf   |           |            |            |           |           |            |           |            |            |
| ASLNC18765 | 0.031427  | 0.101    | 2.01   | up   | chr10     | 79468319   | 79470465  | 2146        | AK094613   |           |            |            |           |           |            |           |            |            |
| ASLNC07342 | 0.0316537 | 0.102    | 1.5    | up   | chr7      | 43614621   | 43735608  | 120987      | uc003tii   |           |            |            |           |           |            |           |            |            |
| ASLNC04795 | 0.0317355 | 0.102    | 1.63   | up   | chr2      | 169336709  | 169351182 | 14473       | uc002ued   |           |            |            |           |           |            |           |            |            |
| ASLNC18734 | 0.0320842 | 0.102    | 1.75   | up   | chr22     | 49396855   | 49399268  | 2413        | AK094442   |           |            |            |           |           |            |           |            |            |
| ASLNC13132 | 0.032087  | 0.102    | 1.62   | up   | chrX      | 118417050  | 118470134 | 53084       | uc004erc   |           |            |            |           |           |            |           |            |            |
| ASLNC19485 | 0.0326335 | 0.104    | 1.64   | up   | chr20     | 33040348   | 33042462  | 2024        | AK098707   |           |            |            |           |           |            |           |            |            |
| ASLNC12737 | 0.0345987 | 0.108    | 1.5    | up   | chr21     | 46480565   | 46496171  | 15606       | uc002zis   |           |            |            |           |           |            |           |            |            |
| ASLNC07420 | 0.0358935 | 0.111    | 1.65   | up   | chr7      | 27622117   | 27633634  | 11517       | uc003szj   |           |            |            |           |           |            |           |            |            |
| ASLNC24309 | 0.0366223 | 0.112    | 1.59   | up   | chr21     | 33865926   | 33866181  | 255         | DQ102771   |           |            |            |           |           |            |           |            |            |
| ASLNC13866 | 0.037132  | 0.113    | 1.59   | up   | chr3      | 130061248  | 130062059 | 811         | CR062639   |           |            |            |           |           |            |           |            |            |
| H09878    | 0.0374259 | 0.114    | 1.56   | up   | chr14     | 34968948   | 34969309  | 361         | HMlinRNA320 |           |            |            |           |           |            |           |            |            |
| ASLNC05889 | 0.0395321 | 0.118    | 1.59   | up   | chr5      | 179166929  | 179173204 | 6275        | uc003mkt   |           |            |            |           |           |            |           |            |            |
| ASLNC11541 | 0.0398787 | 0.119    | 1.51   | up   | chr17     | 76554633   | 76559608  | 4975        | uc002jyv   |           |            |            |           |           |            |           |            |            |
| ASLNC01364 | 0.0401622 | 0.12     | 1.51   | up   | chr10     | 64894994   | 64896326  | 1332        | NR_027182  |           |            |            |           |           |            |           |            |            |
| ASLNC03300 | 0.0407837 | 0.121    | 1.55   | up   | chr1      | 3806830    | 3823649   | 16819       | uc001alg   |           |            |            |           |           |            |           |            |            |
| ASLNC14276 | 0.0424285 | 0.124    | 1.62   | up   | chr19     | 51914607   | 51941503  | 26896       | CR749727   |           |            |            |           |           |            |           |            |            |
| ASLNC17589 | 0.0447187 | 0.128    | 1.54   | up   | chr1      | 184672627  | 184674945 | 2318        | AK055021   |           |            |            |           |           |            |           |            |            |
| ASLNC16320 | 0.0447865 | 0.128    | 1.54   | up   | chr20     | 31669416   | 31670899  | 1483        | AK021595   |           |            |            |           |           |            |           |            |            |
| ASLNC10599 | 0.0454602 | 0.13     | 1.53   | up   | chr15     | 87705813   | 87740701  | 34888       | uc002hnt   |           |            |            |           |           |            |           |            |            |
| ASLNC   | p-value | q-value | log2FoldChange | Gene | Chr | Start    | End      | Length | Symbol    |
|---------|---------|---------|----------------|------|-----|----------|----------|--------|-----------|
| 0.0469317 | 0.133   | 1.58    | up             | chr4 | 7083181 | 7098859  | 15678  | AK126065  |
| 0.0469779 | 0.133   | 1.5     | up             | chr2 | 27411912 | 27414172 | 2260   | ASO1856   |
| 0.0474091 | 0.134   | 1.57    | up             | chr7 | 66295181 | 66404841 | 109660 | uc003tvo  |
| 0.0483849 | 0.136   | 1.48    | up             | chr19| 50909484 | 50912479 | 2995   | uc002pda  |
| < 1e-07   | < 1e-07 | 7.56    | up             | chrX | 132859135| 132859615| 480    | AF085935  |
| 0.0000002 | 0.000395| 0.19    | down           | chr2 | 88941511 | 89315056 | 373545 | HIV1411   |
| 0.0000005 | 0.0000395| 0.18   | down           | chr2 | 87419379 | 87419662 | 283    | uc010fgx  |
| 0.0000007 | 0.000763| 0.23    | down           | chr21| 34813585 | 34815693 | 2108   | AK095069  |
| 0.0000012 | 0.000143| 0.24    | down           | chr4 | 69732804 | 69733878 | 1074   | AF116565  |
| 0.0000019 | 0.00006 | 0.28    | down           | chr16| 80685430 | 80689639 | 4209   | BX648557  |
| 0.0000024 | 0.000174| 0.24    | down           | chr13| 96730804 | 96732305 | 1501   | AF339810  |
| 0.0000024 | 0.000174| 0.28    | down           | chr4 | 17469040 | 17469719 | 2155   | AK021601  |
| 0.000005  | 0.000276| 0.34    | down           | chr7 | 14220417 | 14221054 | 6368   | uc003wbf  |
| 0.0000055 | 0.000296| 0.38    | down           | chr2 | 144935148| 144938115| 2967   | AK098835  |
| 0.0000057 | 0.000304| 0.37    | down           | chr16| 55267149 | 55269154 | 2005   | NR_003669 |
| 0.0000071 | 0.000342| 0.25    | down           | chr7 | 100557104| 100557915| 811    | uc003uxs  |
| 0.0000095 | 0.00041 | 0.28    | down           | chr7 | 78921243 | 78930237 | 8994   | uc010lea  |
| 0.0000098 | 0.000415| 0.27    | down           | chr21| 34810661 | 34815695 | 5034   | AY007090  |
| 0.0000104 | 0.000435| 0.3     | down           | chr4 | 185523334| 185528018| 4684   | uc003iwe  |
| 0.0000123 | 0.000482| 0.36    | down           | chr11| 1712635  | 1728386  | 15751  | uc001hub  |
| 0.0000124 | 0.000484| 0.27    | down           | chr2 | 88937790 | 88941389 | 3599   | uc002sti  |
| 0.0000133 | 0.000509| 0.37    | down           | chr7 | 33938954 | 33940654 | 1700   | U85992    |
| 0.0000135 | 0.00051 | 0.44    | down           | chr7 | 142015814| 142199560| 183746 | HIV2426   |
| 0.0000196 | 0.00066 | 0.25    | down           | chr5 | 95213947 | 95221590 | 7643   | HMlincRNA417 |
| 0.0000205 | 0.000674| 0.36    | down           | chr11| 43921167 | 43921924 | 757    | BC024745  |
| 0.0000206 | 0.000674| 0.41    | down           | chr7 | 142194808| 142210546| 15738  | uc010loq   |
| ASLNC16333 | 0.0000219 | 0.000709 | 0.34 | down | chr5 | 38526474 | 38527954 | 1480 | AK021628 |
| ASLNC11164 | 0.0000227 | 0.000725 | 0.27 | down | chr16 | 55235099 | 55236224 | 1125 | uc010cci |
| ASLNC21985 | 0.0000235 | 0.000743 | 0.36 | down | chr21 | 39101903 | 39104979 | 3076 | AY216265 |
| ASLNC02719 | 0.0000246 | 0.000763 | 0.26 | down | chr15 | 19974283 | 19974577 | 294 | HIV1707 |
| Y00062      | 0.000026  | 0.000793 | 0.44 | down | chr1  | 196551575 | 196992953 | 441378 chr1:196813275-196869300 |
| ASLNC19342 | 0.0000276 | 0.000807 | 0.5  | down | chr19 | 4865682  | 4867832  | 2150 | AK097879 |
| ASLNC19643 | 0.0000287 | 0.00084  | 0.49 | down | chr2  | 191533493 | 191535668 | 2175 | AK123493 |
| ASLNC07731 | 0.0000299 | 0.00086  | 0.45 | down | chr8  | 26778933 | 26780677 | 1744 | uc010lun |
| ASLNC10044 | 0.0000301 | 0.00086  | 0.27 | down | chr14 | 105205502 | 105210208 | 4706 | uc001ysb |
| ASLNC02086 | 0.0000311 | 0.000863 | 0.41 | down | chr20 | 22489193 | 22507280 | 18087 | NR_001558 |
| CD109474    | 0.0000436 | 0.00106  | 0.23 | down | chr20 | 50260588 | 50696687 | 436099 HMLincRNA938 |
| ASLNC09954 | 0.0000462 | 0.00111  | 0.46 | down | chr13 | 29812417 | 29846036 | 33619 | uc001usu |
| ASLNC01482 | 0.0000463 | 0.00111  | 0.21 | down | chr11 | 1661075  | 1663435  | 2360 | NR_026642 |
| ASLNC07363 | 0.0000567 | 0.00126  | 0.41 | down | chr7  | 142204373 | 142209229 | 4856 | uc003wbg |
| ASLNC08526 | 0.0000569 | 0.00126  | 0.44 | down | chr10 | 11335759 | 11338633 | 2874 | uc001kr |
| ASLNC11297 | 0.0000627 | 0.00134  | 0.46 | down | chr17 | 181935  | 183234  | 1299 | uc002frc |
| ASLNC19208 | 0.0000666 | 0.00138  | 0.44 | down | chr2  | 143802262 | 143804133 | 1871 | AK097114 |
| ASLNC15327 | 0.0000667 | 0.00138  | 0.44 | down | chr22 | 35081351 | 35081844 | 493  | AF085963 |
| ASLNC11181 | 0.00007   | 0.00142  | 0.3  | down | chr16 | 55273895 | 55275609 | 1714 | uc002zej |
| ASLNC10063 | 0.0000738 | 0.00147  | 0.45 | down | chr14 | 105121113 | 105121750 | 637  | uc010axn |
| ASLNC02724 | 0.0000785 | 0.00154  | 0.2  | down | chr15 | 19974282 | 19974577 | 295  | HIV1713 |
| ASLNC07196 | 0.0000805 | 0.00157  | 0.44 | down | chr7  | 142204822 | 142209229 | 4407 | uc003wbk |
| ASLNC06824 | 0.0000807 | 0.00157  | 0.4  | down | chr7  | 142199505 | 142201153 | 1648 | uc003wba |
| ASLNC09272 | 0.0000883 | 0.0016   | 0.21 | down | chr11 | 1643402  | 1645661  | 2259 | uc009ycz |
| ASLNC08338 | 0.0000837 | 0.00161  | 0.32 | down | chr9  | 19119734 | 19139253 | 19519 | uc003znp |
| ASLNC09261 | 0.0001002 | 0.00183  | 0.43 | down | chr11 | 43921912 | 43925332 | 3420 | uc001mxv |

32
| ID          | LogFoldChange | pValue | qValue | Direction | Chromosome | StartPosition | EndPosition | Strand | Gene | Description                  |
|-------------|---------------|--------|--------|-----------|------------|---------------|-------------|--------|------|-------------------------------|
| ASLNC07042 | 0.0001006     | 0.00184 | 0.48   | down      | chr7       | 141943612     | 142209229   | -      | uc003vzg                      |
| ASLNC24329 | 0.0001114     | 0.00199 | 0.27   | down      | chr16      | 31984886      | 31985175    | -      | DQ535378                      |
| CV403656   | 0.0001223     | 0.0021  | 0.38   | down      | chr9       | 32935921      | 32936418    | -      | chr9:32926300-32939200       |
| ASLNC23779 | 0.0001293     | 0.00218 | 0.37   | down      | chr2       | 46411922      | 46412916    | -      | BC070392                      |
| ASLNC17466 | 0.0001328     | 0.00221 | 0.47   | down      | chr8       | 119151166     | 119153346   | -      | AK027368                      |
| ASLNC02187 | 0.0001333     | 0.00222 | 0.32   | down      | chr22      | 20982462      | 21007324    | -      | NR_027293                     |
| ASLNC16555 | 0.0001422     | 0.00231 | 0.39   | down      | chr18      | 57704226      | 57705928    | -      | AK022150                      |
| ASLNC05648 | 0.0001469     | 0.00236 | 0.33   | down      | chr4       | 18744245      | 18765914    | -      | uc003izb                      |
| ASLNC23659 | 0.0001687     | 0.00258 | 0.49   | down      | chr19      | 56347992      | 56377034    | -      | BC045766                      |
| ASLNC11676 | 0.0001913     | 0.00278 | 0.49   | down      | chr17      | 55271008      | 55273490    | -      | uc002ixv                       |
| ASLNC02723 | 0.0001958     | 0.00282 | 0.31   | down      | chr14      | 105400454     | 106166467   | -      | HIV1712                        |
| CN413145   | 0.0002012     | 0.00288 | 0.29   | down      | chr7       | 11203458      | 11328476    | -      | HMlincRNA1254                  |
| ASLNC15668 | 0.000205     | 0.00292 | 0.44   | down      | chr11      | 12056690      | 12056740    | -      | AF143331                      |
| BE765125   | 0.0002057    | 0.00292 | 0.49   | down      | chr9       | 32935726      | 32936242    | -      | chr9:32926300-32939200       |
| ASLNC07117 | 0.0002144   | 0.003  | 0.4    | down      | chr7       | 142194808     | 14220153    | -      | uc003was                       |
| ASLNC16767 | 0.0002224   | 0.00308 | 0.45   | down      | chr3       | 115965803     | 115967561   | -      | AK023302                      |
| ASLNC13238 | 0.0002329   | 0.00316 | 0.47   | down      | chrX       | 133506122     | 133508319   | -      | uc004exm                       |
| AA382174   | 0.0002396   | 0.00322 | 0.41   | down      | chr1       | 148811560     | 148811880   | -      | HMlincRNA1030                  |
| ASLNC06839 | 0.0002589   | 0.00342 | 0.41   | down      | chr7       | 142204811     | 142209229   | -      | uc003wbj                      |
| AB962686   | 0.0002648  | 0.00347 | 0.43   | down      | chr17      | 10612214      | 10612999    | -      | chr17:10598925-10629325      |
| ASLNC16259 | 0.0002727   | 0.00354 | 0.33   | down      | chr15      | 59164337      | 59165867    | -      | AK021439                      |
| AA307003   | 0.000279   | 0.00357 | 0.22   | down      | chr4       | 104396764     | 104594264   | -      | chr4:104483350-104521000      |
| ASLNC01548 | 0.0002814 | 0.00358 | 0.24   | down      | chr12      | 9109039       | 9111918    | -      | NR_026971                      |
| ASLNC24551 | 0.0002966 | 0.00374 | 0.54   | down      | chr17      | 7418787       | 7420209    | -      | U79273                         |
| ASLNC02722 | 0.0002978 | 0.00375 | 0.3    | down      | chr14      | 105401469     | 105862329   | -      | HIV1711                        |
| Gene Symbol | Gene Name | FDR   | q-value | Log2 Fold Change | Chromosome | Start | End   | Length | Location | Refseq ID |
|-------------|-----------|-------|--------|------------------|------------|-------|-------|--------|----------|-----------|
| ASLNC21888 |           | 0.003 | 0.003  | 0.36             | chr5       | 35914174  | 35915458  | 1284   | AL713738 |
| ASLNC02728 |           | 0.003 | 0.003  | 0.38             | chr14      | 105401469  | 105876550  | 475081 | HIV1718  |
| ASLNC17908 |           | 0.003 | 0.003  | 0.41             | chr17      | 14171376  | 14173516  | 2140   | AK057070 |
| ASLNC15759 |           | 0.003 | 0.003  | 0.5              | chr5       | 142306317  | 142306854  | 537    | AF147424 |
| CR736960   |           | 0.003 | 0.003  | 0.44             | chr17      | 10612035  | 10612503  | 468    | chr17:10598925-10629325 |
| ASLNC17636 |           | 0.003 | 0.003  | 0.37             | chr1       | 162836509  | 162838570  | 2061   | AK055280 |
| DW417964   |           | 0.003 | 0.003  | 0.33             | chr1       | 148808703  | 148808991  | 288    | HMlincRNA1030 |
| ASLNC17565 |           | 0.003 | 0.003  | 0.41             | chr12      | 112012639  | 112015414  | 1875   | AK054946 |
| ASLNC21516 |           | 0.003 | 0.003  | 0.48             | chr6       | 42107548  | 42108910  | 1362   | AK130763 |
| ASLNC24104 |           | 0.003 | 0.003  | 0.46             | chr19      | 13806330  | 13808103  | 1773   | BX640708 |
| ASLNC02727 |           | 0.003 | 0.003  | 0.29             | chr14      | 105401841  | 105948960  | 547119 | HIV1717  |
| ASLNC07050 |           | 0.003 | 0.003  | 0.44             | chr7       | 142196804  | 142201153  | 4349   | uc003waz |
| ASLNC10081 |           | 0.003 | 0.003  | 0.48             | chr14      | 105241346  | 105241984  | 638    | uc001ysc |
| ASLNC22002 |           | 0.003 | 0.003  | 0.54             | chr9       | 68198838  | 68201492  | 2654   | AY343893 |
| ASLNC24125 |           | 0.003 | 0.003  | 0.34             | chr2       | 88203624  | 88206504  | 2880   | BX641099 |
| AK297526   |           | 0.004 | 0.004  | 0.23             | chr12      | 50702882  | 50739100  | 36218  | HMlincRNA602 |
| ASLNC21195 |           | 0.004 | 0.004  | 0.54             | chr1       | 5676835  | 56769997  | 1612   | AK129996 |
| ASLNC17065 |           | 0.004 | 0.004  | 0.32             | chr2       | 23202163  | 23203092  | 929    | AK024624 |
| ASLNC20094 |           | 0.004 | 0.004  | 0.55             | chr13      | 47977202  | 47980894  | 3692   | AK125170 |
| DA905574   |           | 0.005 | 0.005  | 0.28             | chr7       | 11199517  | 11233981  | 34464  | HMlincRNA1254 |
| ASLNC01997 |           | 0.005 | 0.005  | 0.37             | chr19      | 46122009  | 46148405  | 26396  | NR_001278 |
| ASLNC03068 |           | 0.006 | 0.006  | 0.47             | chr2       | 21863212  | 21863428  | 2135   | LIT2061 |
| ASLNC07364 |           | 0.006 | 0.006  | 0.5              | chr7       | 142127671  | 142201153  | 73482  | uc003waj |
| ASLNC24140 |           | 0.006 | 0.006  | 0.44             | chr9       | 111046567  | 111048934  | 2367   | BX647103 |
| ASLNC10468 |           | 0.006 | 0.006  | 0.51             | chr15      | 94613004  | 94671581  | 58577  | uc010bol |
| ASLNC10032 |           | 0.006 | 0.006  | 0.36             | chr14      | 105280158  | 105285359  | 5201   | uc001ysg |
| Gene Name   | log2 Fold Change | p-value | q-value | Chromosome | Start | End   | Gene Name     | log2 Fold Change | p-value | q-value | Chromosome | Start | End   |
|-------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|--------------|-----------------|---------|---------|------------|-------|-------|
| ASLNC18865 | 0.0007192       | 0.00674 | 0.38    | chr4       | 23489922 | 23492694 | 2772         | AK095100        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC10248 | 0.0007209       | 0.00675 | 0.47    | chr14      | 21528480 | 22086559 | 558079       | uc001wco        |         |         |            |       |       |              |                 |         |         |            |       |       |
| BI832838   | 0.0007487       | 0.00674 | 0.36    | chr1       | 148803932| 148804517| 585          | HMlincRNA1030   |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC16821 | 0.0008099       | 0.0073  | 0.57    | chr16      | 70616440 | 70619063 | 2623         | AK098239        |         |         |            |       |       |              |                 |         |         |            |       |       |
| BM043959   | 0.0008126       | 0.00731 | 0.4     | chr1       | 148808483| 148809211| 728          | HMlincRNA1030   |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC18819 | 0.0008634       | 0.00768 | 0.53    | chr19      | 1336157  | 1340650  | 443          | AK094875        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC15871 | 0.0008753       | 0.00775 | 0.37    | chr13      | 96802238 | 96804294 | 2056         | AF339768        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC12031 | 0.0008784       | 0.00777 | 0.44    | chr19      | 54707697 | 54721366 | 13669        | uc002pod        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC18277 | 0.0008797       | 0.00777 | 0.54    | chr9       | 76952426 | 76954167 | 1741         | AK091034        |         |         |            |       |       |              |                 |         |         |            |       |       |
| AK096140   | 0.0008927       | 0.00785 | 0.23    | chr5       | 95213694 | 95221590 | 7896         | HMlincRNA117    |         |         |            |       |       |              |                 |         |         |            |       |       |
| AA829056   | 0.0009419       | 0.00816 | 0.37    | chr1       | 148808383| 148808828| 445          | HMlincRNA1030   |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC02729 | 0.0009594       | 0.00824 | 0.5     | chr14      | 101091638| 101094924| 3286         | HIV1721         |         |         |            |       |       |              |                 |         |         |            |       |       |
| BM678241   | 0.001066        | 0.00892 | 0.33    | chr17      | 66286339 | 66512229 | 225890       | chr17:66488275-66507650 |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC23708 | 0.0011028       | 0.00914 | 0.54    | chr2       | 160508574| 160509899| 1325         | BC065212        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC17185 | 0.0011574       | 0.00945 | 0.42    | chr8       | 119158339| 119160615| 2276         | AK025143        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC08303 | 0.0011688       | 0.00952 | 0.51    | chr9       | 37495586 | 37500377 | 4791         | uc004aaa        |         |         |            |       |       |              |                 |         |         |            |       |       |
| AW024518   | 0.0012086       | 0.0097 | 0.35    | chr1       | 67767900 | 67770600 | 2700         | HMlincRNA1286   |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC01388 | 0.001212       | 0.00972 | 0.33    | chr10      | 4903860  | 4948465  | 44605        | NR_026743       |         |         |            |       |       |              |                 |         |         |            |       |       |
| CA426679   | 0.0012722      | 0.01    | 0.46    | chr17      | 10612478 | 10613113 | 635          | chr17:10598925-10629325 |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC24245 | 0.0012897      | 0.0101  | 0.42    | chr4       | 57617945 | 57626272 | 8777         | BX648756        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC19171 | 0.0013912      | 0.0107  | 0.52    | chr1       | 842817   | 846259   | 3442         | AK096928        |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC07087 | 0.0014131      | 0.0109  | 0.46    | chr7       | 142205050| 142210546| 5496         | uc003wbn        |         |         |            |       |       |              |                 |         |         |            |       |       |
| AA572879   | 0.0014415      | 0.011   | 0.4     | chr1       | 148808391| 148808818| 427          | HMlincRNA1030   |         |         |            |       |       |              |                 |         |         |            |       |       |
| ASLNC21627 | 0.0014529      | 0.0111  | 0.57    | chr1       | 115678002| 115680438| 2436         | AK172772        |         |         |            |       |       |              |                 |         |         |            |       |       |
| AA332648   | 0.0014882      | 0.0112  | 0.41    | chr9       | 32935966 | 32936232 | 266          | chr9:32926300-32939200 |         |         |            |       |       |              |                 |         |         |            |       |       |
| Gene ID     | logFC   | p-value | Direction | Chromosome | Start | End   | Length | Gene Name            |
|------------|---------|---------|-----------|------------|-------|-------|--------|----------------------|
| ASLNC18398| 0.0015555| 0.0116  | down      | chr16      | 56366121| 56368514| 2393   |                     |
| ASLNC23793| 0.0015892| 0.0118  | down      | chr18      | 57626282| 57627933| 1651   |                     |
| ASLNC06822| 0.0016397| 0.0121  | down      | chr7       | 142203516| 142209229| 5713   |                     |
| ASLNC10783| 0.0016444| 0.0121  | down      | chr15      | 19974282| 19974717| 435    |                     |
| ASLNC06934| 0.0017099| 0.0125  | down      | chr7       | 142194692| 142201153| 6461   |                     |
| AIF25925   | 0.0017298| 0.0126  | down      | chr20      | 57182560| 57182955| 395    | chr20:5718600-57188600 |
| DA860017   | 0.0017529| 0.0127  | down      | chr14      | 52754179| 53223726| 469547 | chr14:52757725-52912850 |
| ASLNC18414| 0.0017801| 0.0129  | down      | chr2       | 220127043| 220128810| 1767   |                     |
| ASLNC04653| 0.0017832| 0.0129  | down      | chr2       | 241542710| 241555541| 12831  |                     |
| ASLNC12692| 0.0018359| 0.0132  | down      | chr21      | 45165393| 45174016| 8623   |                     |
| ASLNC02721| 0.0018438| 0.0132  | down      | chr14      | 105948664| 105948956| 292    |                     |
| ASLNC03000| 0.0019127| 0.0135  | down      | chr9       | 35647750| 35648014| 264    |                     |
| ASLNC07188| 0.0020229| 0.0142  | down      | chr7       | 27102267| 27106109| 3842   |                     |
| ASLNC19115| 0.0020993| 0.0146  | down      | chr15      | 22828112| 22830969| 2857   |                     |
| ASLNC24694| 0.0021082| 0.0146  | down      | chr6       | 26022288| 26022815| 527    |                     |
| ASLNC15588| 0.0021525| 0.0148  | down      | chr8       | 105460828| 105463912| 3084   |                     |
| ASLNC01769| 0.0021526| 0.0148  | down      | chr16      | 54784029| 54785938| 1909   |                     |
| ASLNC06184| 0.0021679| 0.0149  | down      | chr5       | 177310865| 177317533| 6668   |                     |
| ASLNC17085| 0.0021934| 0.015   | down      | chr19      | 36519777| 36521670| 1893   |                     |
| ASLNC09474| 0.0021997| 0.015   | down      | chr12      | 123964079| 123964618| 539    |                     |
| ASLNC11235| 0.0022104| 0.0151  | down      | chr16      | 33659897| 33660388| 491    |                     |
| BF895497   | 0.002245 | 0.0153  | down      | chr19      | 7339554| 7339788| 234    | chr19:7320850-7339925 |
| ASLNC16667| 0.0023846| 0.0159  | down      | chr6       | 42040803| 42042487| 1684   |                     |
| ASLNC01754| 0.002418 | 0.016   | down      | chr16      | 29210041| 29293098| 83057  |                     |
| AW979087   | 0.0024412| 0.0162  | down      | chr1       | 148808376| 148808867| 491    |                     |
| ASLNC07931| 0.0024675| 0.0163  | down      | chr9       | 42847906| 42883134| 35228  |                     |
| GeneID       | FDR   | FDRp   | pval  | Type | Chromosome | Start   | End     | Length | Symbol   | StartChr | EndChr | SymbolChr | Description |
|-------------|-------|--------|-------|------|------------|---------|---------|--------|----------|----------|--------|------------|-------------|
| ASLNC01026  | 0.0025608 | 0.0168 | 0.56  | down | chr6_qbl_hap2 | 4266694 | 4283007 | 16313  | NR_001435 |          |        |            |             |
| ASLNC23764  | 0.0025721 | 0.0168 | 0.55  | down | chr9      | 37903051 | 37905658 | 2607   | BC069218 |          |        |            |             |
| W05807      | 0.0026479 | 0.0171 | 0.29  | down | chr2      | 37570138 | 37686025 | 115887 | chr2:37629600-37715550 | |
| ASLNC15172  | 0.0027167 | 0.0175 | 0.27  | down | chr1      | 112114817 | 112116714 | 1897   | AF070632 |          |        |            |             |
| ASLNC18461  | 0.0027623 | 0.0179 | 0.28  | down | chr21     | 16925160 | 16925599 | 439    | chr21:16915600-16968019 | |
| DB558098    | 0.0028122 | 0.0181 | 0.47  | down | chr20     | 61461783 | 61472973 | 11190  | AK127527 |          |        |            |             |
| ASLNC08161  | 0.0028781 | 0.0186 | 0.46  | down | chr1      | 148811427 | 148811845 | 418    | HMlincRNA1030 | |
| ASLNC11243  | 0.0030204 | 0.0193 | 0.55  | down | chr5      | 148766633 | 148788430 | 21797  | uc003lqq |          |        |            |             |
| ASLNC14902  | 0.0030920 | 0.0198 | 0.43  | down | chr2      | 107737032 | 107795236 | 58204  | chr2:107594300-107750025 | |
| ASLNC19575  | 0.0031228 | 0.0199 | 0.49  | down | chr5      | 115832558 | 115834005 | 1447   | AB002438 |          |        |            |             |
| ASLNC19575  | 0.0031768 | 0.0201 | 0.49  | down | chr1      | 206041489 | 206044048 | 2559   | AK123264 |          |        |            |             |
| AA633838    | 0.0031988 | 0.0204 | 0.51  | down | chr2      | 80738880 | 80740951 | 2071   | HIV1716 |          |        |            |             |
| ASLNC05891  | 0.0032488 | 0.0204 | 0.51  | down | chr2      | 59129926 | 59132381 | 24556  | AK055783 |          |        |            |             |
| ASLNC17732  | 0.0032843 | 0.0205 | 0.53  | down | chr13     | 97727277 | 97728409 | 682    | AF339801 |          |        |            |             |
| ASLNC21099  | 0.0033724 | 0.0209 | 0.61  | down | chr7      | 8261190  | 8263373 | 2183   | AK057561 |          |        |            |             |
| ASLNC15891  | 0.0034542 | 0.0209 | 0.61  | down | chr6      | 25907020 | 25919928 | 12908  | Y10513 |          |        |            |             |
| BP872601    | 0.0034571 | 0.0209 | 0.61  | down | chr7      | 79713672 | 79779708 | 66036  | chr7:79757325-79769550 | |
| ASLNC17999  | 0.0034801 | 0.0211 | 0.43  | down | chr6      | 8261190  | 8263373 | 2183   | AK057561 |          |        |            |             |
| ASLNC24656  | 0.0034886 | 0.0211 | 0.43  | down | chr7      | 142103175 | 142209229 | 106054 | u003wad |          |        |            |             |
| ASLNC07232  | 0.0035955 | 0.0216 | 0.57  | down | chr7      | 105900639 | 105948945 | 48306  | HIV1716 |          |        |            |             |
| ASLNC02726  | 0.0036531 | 0.0218 | 0.43  | down | chr14     | 80738880 | 80740951 | 2071   | u003ybk |          |        |            |             |
| ASLNC07618  | 0.0037317 | 0.0222 | 0.51  | down | chr8      | 65749284 | 66032796 | 283512 | chr14:6579745-66001975 | |
| ASLNC  | Start | End   | Length | Strand | Chromosome | Start | End   | Length | Gene ID | Description |
|--------|-------|-------|--------|--------|------------|-------|-------|--------|---------|-------------|
| 17446  | 0.0039145 | 0.0229 | 0.51 | down | chr16 | 20773749 | 20775847 | 2098 | AK027199 |
| 01637  | 0.0039407 | 0.023 | 0.58 | down | chr14 | 101088312 | 101091766 | 3454 | NR_002770 |
| 23407  | 0.0040609 | 0.0235 | 0.51 | down | chr12 | 69204342 | 69207642 | 3300 | BC043182 |
| 03131  | 0.0041221 | 0.0238 | 0.46 | down | chr19 | 15800756 | 15807226 | 6470 | LIT3336 |
| 08469  | 0.0041232 | 0.0238 | 0.45 | down | chr10 | 99368551 | 99372506 | 3955 | uc001kof |
| 16850  | 0.0041221 | 0.0238 | 0.46 | down | chr9  | 167701272 | 167703399 | 2197 | AK023753 |
| 19507  | 0.0042262 | 0.0245 | 0.52 | down | chr5  | 130359933 | 130362130 | 2197 | AK122774 |
| 10340  | 0.0042944 | 0.0245 | 0.49 | down | chr7  | 85390767 | 85392474 | 1707 | BC064139 |
| 23407  | 0.0042947 | 0.0245 | 0.49 | down | chr14 | 22062413 | 22086559 | 12212 | uc001wgf |
| 03153  | 0.0044937 | 0.0253 | 0.53 | down | chr1  | 66272177 | 66275119 | 2942 | AK096635 |
| 03153  | 0.0045775 | 0.0257 | 0.58 | down | chr21 | 34401692 | 34403975 | 2283 | BC063139 |
| 03153  | 0.0046423 | 0.0259 | 0.63 | down | chr16 | 66272177 | 66275119 | 2942 | AK096635 |
| 03153  | 0.0046618 | 0.026 | 0.54 | down | chr7  | 155285494 | 155294527 | 9033 | LIT3481 |
| 10141  | 0.0046919 | 0.0261 | 0.49 | down | chr14 | 101093399 | 101096493 | 3094 | uc001ykh |
| 08074  | 0.0047171 | 0.0262 | 0.46 | down | chr9  | 66944086 | 66979312 | 35226 | uc004aen |
| 18679  | 0.0047177 | 0.0262 | 0.4 | down | chr15 | 59134331 | 59136802 | 2471 | AK094258 |
| 21218  | 0.0048088 | 0.0265 | 0.55 | down | chr12 | 56517142 | 56523811 | 6669 | AK130110 |
| 01469  | 0.004852 | 0.0268 | 0.53 | down | chr11 | 66841885 | 66915734 | 73849 | NR_024469 |
| 19173  | 0.0050023 | 0.0274 | 0.54 | down | chr2  | 241274423 | 241277212 | 2789 | AK096937 |
| 07761  | 0.0051404 | 0.0279 | 0.62 | down | chr8  | 12438958 | 12567502 | 128544 | uc003wvy |
| 12290  | 0.0052113 | 0.0282 | 0.58 | down | chr19 | 46651913 | 46698399 | 4686 | uc002orb |
| 59844  | 0.0053105 | 0.0287 | 0.55 | down | chr7  | 155980128 | 155980460 | 332 | chr7:155933475-155996100 |
| 16271  | 0.0053356 | 0.0288 | 0.5 | down | chr1 | 162921158 | 162923422 | 2264 | AK021467 |
| 18091  | 0.0053815 | 0.0289 | 0.56 | down | chr4 | 160046637 | 160048644 | 2007 | AK057981 |
| 13025  | 0.0054915 | 0.0292 | 0.52 | down | chr22 | 19798896 | 19805980 | 7084 | uc002zuj |
| Gene   | 0.0055253 | 0.0293 | 0.55 | down | chr8 | 102133457 | 102157655 | 24198 | AK124959 |
|--------|-----------|--------|------|------|------|-----------|-----------|-------|---------|
| ASLNC11308 | 0.0056105 | 0.0296 | 0.5  | down | chr17 | 37036104 | 37045191 | 9087  | uc010cxq |
| ASLNC15675 | 0.0057618 | 0.0302 | 0.58 | down | chr3  | 112949354 | 112952671 | 3317  | AF143877 |
| ASLNC21231 | 0.0057799 | 0.0303 | 0.5  | down | chr18 | 44798040 | 44800145 | 2105  | AK130189 |
| ASLNC21098 | 0.0058732 | 0.0303 | 0.61 | down | chr14 | 54317478 | 54319625 | 2147  | AK129698 |
| ASLNC02233 | 0.0057953 | 0.0303 | 0.56 | down | chrX  | 133505073 | 133508326 | 3253  | NR_024607 |
| ASLNC22463 | 0.0058003 | 0.0303 | 0.54 | down | chr3  | 143215856 | 143224505 | 8649  | BC025982 |
| ASLNC14962 | 0.0058225 | 0.0304 | 0.55 | down | chr8  | 11002131 | 11004128 | 1997  | AB073660 |
| ASLNC23150 | 0.005839  | 0.0304 | 0.51 | down | chr8  | 107351656 | 107354179 | 2523  | BC040619 |
| ASLNC24352 | 0.0058825 | 0.0306 | 0.49 | down | chr10 | 46555052 | 46556469 | 1417  | DQ786233 |
| AI364598 | 0.0059538 | 0.0308 | 0.47 | down | chr1  | 148811556 | 148811942 | 386   | HMlincRNA1030 |
| ASLNC16527 | 0.0062498 | 0.032  | 0.54 | down | chr4  | 74336117 | 74337789 | 1672  | AK022086 |
| AA858138 | 0.0063413 | 0.0323 | 0.55 | down | chr2  | 177771644 | 177772046 | 402   | HMlincRNA870 |
| ASLNC15942 | 0.0063581 | 0.0324 | 0.51 | down | chr3  | 46909290 | 46911554 | 2264  | AF495723 |
| BF767775 | 0.0063875 | 0.0325 | 0.52 | down | chr4  | 15245798 | 152457800 | 302   | HMlincRNA1014 |
| DB074989 | 0.0066627 | 0.0335 | 0.37 | down | chr2  | 37645164 | 37692871 | 227707 | chr2:37629600-37715550 |
| ASLNC04837 | 0.0066812 | 0.0335 | 0.6  | down | chr2  | 114014104 | 114016712 | 2608  | uc002jtx |
| ASLNC12871 | 0.0067192 | 0.0336 | 0.59 | down | chr22 | 41281290 | 41307961 | 26671 | uc003bcs |
| ASLNC21223 | 0.0067577 | 0.0338 | 0.58 | down | chr12 | 23670891 | 23673346 | 2455  | AK130118 |
| BG477047 | 0.0068575 | 0.0342 | 0.44 | down | chr11 | 127638146 | 127680648 | 42502 | chr11:127666200-127694325 |
| ASLNC16295 | 0.0068613 | 0.0342 | 0.6  | down | chr10 | 137329754 | 13731675 | 1921  | AK021524 |
| ASLNC14379 | 0.006918  | 0.0345 | 0.58 | down | chr1  | 89994815 | 89997411 | 2596  | AL133652 |
| ASLNC04531 | 0.0070657 | 0.035  | 0.34 | down | chr2  | 34756150 | 34801365 | 45215 | uc002rpc |
| ASLNC04435 | 0.0070774 | 0.035  | 0.53 | down | chr2  | 130440634 | 130454515 | 13881 | uc002tpw |
| ASLNC17321 | 0.007122  | 0.0352 | 0.62 | down | chr6  | 109054040 | 109055355 | 1315  | AK026286 |
| ASLNC09842 | 0.0074002 | 0.0363 | 0.47 | down | chr13 | 21513113 | 21748657 | 235544 | uc001uoi |
| Gene     | FDR     | q-value | Expression | Chromosome | Start     | End       | Length |
|----------|---------|---------|------------|------------|-----------|-----------|--------|
| ASLNC082824 | 0.0074902 | 0.0366 | 0.59 | down | chr11 | 1972983 | 1974511 | 1528 |
| AB14372 | 0.0076054 | 0.037 | 0.56 | down | chr2 | 114317329 | 114355962 | 38633 |
| ASLNC20331 | 0.0077477 | 0.0375 | 0.55 | down | chr4 | 8294511 | 8296504 | 1993 |
| ASLNC21523 | 0.0077765 | 0.0376 | 0.59 | down | chr7 | 36544156 | 36546022 | 1866 |
| ASLNC15104 | 0.007787 | 0.0376 | 0.52 | down | chr16 | 83956334 | 83957845 | 1311 |
| ASLNC15055 | 0.0078253 | 0.0377 | 0.58 | down | chr5 | 9210256 | 9210593 | 337 |
| BG323747 | 0.0079999 | 0.0383 | 0.56 | down | chr12 | 1510304 | 1619404 | 109100 |
| ASLNC15598 | 0.0080437 | 0.0384 | 0.6 | down | chr10 | 88833213 | 88835085 | 1872 |
| ASLNC22790 | 0.0082487 | 0.0392 | 0.61 | down | chr21 | 44592077 | 44592606 | 529 |
| ASLNC16053 | 0.0084116 | 0.0399 | 0.57 | down | chr6 | 107272019 | 107281693 | 9674 |
| ASLNC12152 | 0.0084859 | 0.0401 | 0.59 | down | chr19 | 7759263 | 7761065 | 1802 |
| ASLNC01762 | 0.0085082 | 0.0402 | 0.46 | down | chr16 | 55208873 | 55210231 | 1358 |
| exon4582 | 0.0087078 | 0.0409 | 0.5 | down | chr9 | 125146233 | 125146501 | 268 |
| BC036122 | 0.0087839 | 0.0411 | 0.54 | down | chr1 | 89871218 | 90002649 | 131431 |
| AW856643 | 0.0090637 | 0.0421 | 0.52 | down | chr1 | 148809244 | 148809633 | 389 |
| BM992765 | 0.0090779 | 0.0421 | 0.5 | down | chr1 | 148804911 | 148805524 | 613 |
| ASLNC25050 | 0.0092915 | 0.0429 | 0.49 | down | chr13 | 96806820 | 96807071 | 251 |
| AT376835 | 0.0094475 | 0.0435 | 0.43 | down | chr2 | 16131738 | 16138690 | 6952 |
| ASLNC02827 | 0.0094902 | 0.0436 | 0.35 | down | chr11 | 1973038 | 1974440 | 1402 |
| BG779924 | 0.0095271 | 0.0437 | 0.52 | down | chr8 | 57125554 | 57126329 | 775 |
| ASLNC16276 | 0.0095321 | 0.0437 | 0.45 | down | chr11 | 66206827 | 66209310 | 2483 |
| BI001709 | 0.0096205 | 0.044 | 0.61 | down | chr2 | 177771658 | 177772015 | 357 |
| ASLNC11520 | 0.009699 | 0.0442 | 0.55 | down | chr17 | 37036104 | 37049977 | 13873 |
| ASLNC08321 | 0.0099486 | 0.0451 | 0.59 | down | chr9 | 115893738 | 115901328 | 7590 |
| BQ707656 | 0.0100257 | 0.0453 | 0.53 | down | chr1 | 171011667 | 171299750 | 288083 |
| ASLNC23542 | 0.0100901 | 0.0455 | 0.55 | down | chr7 | 130270151 | 130271367 | 1216 |

chr2:114283350-114336075
chr12:1511350-1531175
chr9:125140075-125157500
chr1:89972700-89985275
chr1:189972700-189985275
chr1:130271367-130271367
chr1:171117525-171191468
| Gene       | ID          | FDR    | qval   | log2FoldChange | chrom | start | end   | length | Location  | Description  |
|------------|-------------|--------|--------|----------------|-------|-------|-------|--------|-----------|--------------|
| AK091430  | 0.0100924   | 0.0455 | 0.61   | down           | chrX  | 109326293 | 109570114 | 243821 | chrX:109471950-109537553 |
| ASLNC18449| 0.0101735   | 0.0457 | 0.6    | down           | chr17 | 16258562  | 16260728  | 2166   | AK092443  |
| ASLNC07696| 0.0103102   | 0.0462 | 0.43   | down           | chr8  | 9219970   | 9230000   | 10030  | uc003wsq  |
| ASLNC11311| 0.0103526   | 0.0463 | 0.52   | down           | chr17 | 13620873  | 13636592  | 15719  | uc002goc  |
| ASLNC16530| 0.010797    | 0.0478 | 0.6    | down           | chr1  | 150152574 | 150412993 | 260419 | HMlincRNA854 |
| ASLNC17897| 0.010800    | 0.0479 | 0.56   | down           | chr2  | 150152574 | 150412993 | 260419 | HMlincRNA854 |
| ASLNC14222| 0.0110579   | 0.0486 | 0.54   | down           | chr15 | 58658577  | 58660864  | 2287   | BC040965  |
| ASLNC15046| 0.0111062   | 0.0486 | 0.56   | down           | chr5  | 11293478  | 11294508  | 1030   | AF009270  |
| N54862     | 0.01116475  | 0.0504 | 0.53   | down           | chrX  | 63987315  | 63987654  | 339    | chrX:63958875-64010675 |
| AA164731   | 0.0116845   | 0.0504 | 0.57   | down           | chr17 | 44078944  | 44079384  | 440    | HMlincRNA268 |
| ASLNC00596 | 0.0117297   | 0.0505 | 0.42   | down           | chr1  | 113267494 | 113268818 | 1324   | NR_002796 |
| CV403658   | 0.0117302   | 0.0505 | 0.47   | down           | chr9  | 111186454 | 111187927 | 1473   | BC047239  |
| ASLNC21865 | 0.0118773   | 0.051  | 0.36   | down           | chr16 | 57298537  | 57299029  | 492    | AL360255  |
| ASLNC23559 | 0.0119309   | 0.0512 | 0.59   | down           | chr16 | 965761    | 971591    | 5830   | BC047239  |
| ASLNC17304 | 0.0119698   | 0.0512 | 0.56   | down           | chr4  | 111186454 | 111187927 | 1473   | AK026192  |
| ASLNC08027 | 0.0122371   | 0.0521 | 0.59   | down           | chr9  | 130287600 | 130289885 | 2285   | uc004bvg  |
| ASLNC21152 | 0.0124058   | 0.0527 | 0.48   | down           | chr4  | 23481679  | 23483485  | 1806   | AK129851  |
| ASLNC07204 | 0.0124738   | 0.0529 | 0.5    | down           | chr7  | 100395448 | 100397831 | 2383   | uc010lhn  |
| DA636405   | 0.0124928   | 0.0529 | 0.6    | down           | chr2  | 16044742  | 16045313  | 571    | HMlincRNA297 |
| AW969510   | 0.0125862   | 0.0533 | 0.62   | down           | chr19 | 12751245  | 12751673  | 428    | HMlincRNA297 |
| ASLNC10132 | 0.0125895   | 0.0533 | 0.49   | down           | chr14 | 60839501  | 60859289  | 19788  | uc001xfm  |
| ASLNC15785 | 0.0127933   | 0.054  | 0.62   | down           | chr1  | 158146507 | 158149688 | 461    | AF164144  |
| ASLNC08728 | 0.0128114   | 0.054  | 0.62   | down           | chr10 | 72245721  | 72250246  | 4525   | uc001jrl  |
| Gene          | Score1 | Score2 | Score3 | Score4 | Score5 | Score6 | Score7 | Score8 | Score9 | Score10 | Score11 | Score12 | chr   | Length | Ensembl   | Description | Reference |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|----------|--------|--------|-----------|-------------|-----------|
| ASLNC23977   | 0.013145 | 0.0551 | 0.59   | down   | chr17  | 40338605 | 40338848 | 243    | BC127920 |
| ASLNC01684   | 0.0132237 | 0.0552 | 0.64   | down   | chr15  | 82848741 | 82861082 | 12341  | NR_003246 |
| BG777151     | 0.0133417 | 0.0556 | 0.37   | down   | chr8   | 6533147  | 6553096  | 19949  | chr8:6541450-6552025 |
| ASLNC07538   | 0.0133661 | 0.0556 | 0.63   | down   | chr8   | 12040340 | 12075059 | 34719  | uc003wvd |
| ASLNC18906   | 0.0134475 | 0.0559 | 0.47   | down   | chr13  | 110064242 | 11006701 | 2459   | AK095260 |
| ASLNC17952   | 0.0135115 | 0.0561 | 0.56   | down   | chr7   | 5380849  | 5382846  | 1997   | AK057263 |
| T12556       | 0.0136403 | 0.0565 | 0.54   | down   | chr9   | 136584404 | 136585564 | 1160   | chr9:136571925-136590625 |
| ASLNC15461   | 0.0136841 | 0.0566 | 0.64   | down   | chr15  | 99428054 | 99428535 | 481    | AF086335 |
| ASLNC22214   | 0.014007  | 0.0575 | 0.56   | down   | chr1   | 202647155 | 202648167 | 1012   | BC009873 |
| ASLNC01984   | 0.0141259 | 0.0579 | 0.58   | down   | chr19  | 15800756 | 15807231 | 6475   | NR_015379 |
| exon4143     | 0.0143344 | 0.0584 | 0.56   | down   | chr8   | 37396846 | 37397140 | 294    | chr8:37377750-37470000 |
| AT700526     | 0.0143594 | 0.0585 | 0.56   | down   | chr3   | 71786327 | 71786738 | 411    | chr3:71738000-71797250 |
| ASLNC06133   | 0.0143731 | 0.0585 | 0.56   | down   | chr5   | 1226255  | 1231720  | 5465   | uc003jbv |
| T94317       | 0.0144104 | 0.0586 | 0.6    | down   | chr14  | 30804475 | 30804740 | 265    | HMlincRNA313 |
| ASLNC08349   | 0.0146189 | 0.0591 | 0.4    | down   | chr9   | 66944086 | 66971724 | 27638  | uc004aem |
| BG898852     | 0.0146274 | 0.0591 | 0.52   | down   | chr12  | 68760515 | 68761020 | 505    | chr12:68755950-68789750 |
| ASLNC14831   | 0.0148397 | 0.0596 | 0.67   | down   | chr14  | 101093394 | 101096497 | 3103   | BC037351 |
| ASLNC24398   | 0.0148578 | 0.0596 | 0.63   | down   | chr3   | 52010774 | 52011373 | 599    | L13433 |
| ASLNC00771   | 0.0149553 | 0.0599 | 0.58   | down   | chr3   | 38139204 | 38153737 | 14533  | NR_024024 |
| ASLNC07635   | 0.01501   | 0.0601 | 0.5    | down   | chr8   | 119166914 | 119169679 | 2765   | uc003yol |
| ASLNC24634   | 0.0151811 | 0.0606 | 0.58   | down   | chr19  | 9232729  | 9233201  | 472    | X89673 |
| ASLNC16098   | 0.0152943 | 0.0609 | 0.62   | down   | chr13  | 27433055 | 27433833 | 778    | AK000205 |
| ASLNC20459   | 0.0153278 | 0.061  | 0.63   | down   | chr17  | 37388688 | 3730768  | 1900   | AK126617 |
| BI011154     | 0.0155466 | 0.0616 | 0.47   | down   | chr1   | 148805281 | 148805790 | 509    | HMlincRNA1030 |
| ASLNC02188   | 0.0157676 | 0.0621 | 0.47   | down   | chr22  | 40866157 | 40870519 | 4362   | NR_002570 |
| BX109833     | 0.0158026 | 0.0622 | 0.6    | down   | chr17  | 10600246 | 10600952 | 706    | chr17:10598925-10629325 |
| Location     | Genotype | p-value | FDR   | Effect Size |chr     | Start   | End     | Size   | Adj. p-value | Ref     |
|--------------|----------|---------|-------|-------------|--------|---------|---------|--------|-------------|---------|
| ASLNC14618   | 0.0158602| 0.0624  | 0.6   | down        | chr21  | 45728458| 45729236| 778    | 0.0158602   | BC013148|
| ASLNC24350   | 0.0161534| 0.0632  | 0.62  | down        | chr4   | 9408497 | 9409203 | 706    | 0.0161534   | DQ786220|
| ASLNC08766   | 0.0163382| 0.0637  | 0.61  | down        | chr10  | 4917673 | 4924167 | 6494   | 0.0163382   | uc001ihb|
| DA035282     | 0.0164212| 0.064   | 0.59  | down        | chr17  | 10573845| 10612072| 38227  | 0.0164212   | chr17:10598925-10629325|
| ASLNC22487   | 0.0164688| 0.0641  | 0.56  | down        | chr12  | 42128446| 42129438| 992    | 0.0164688   | AK058085|
| BG204263     | 0.016591 | 0.0644  | 0.5   | down        | chr7   | 92322158| 92384426| 62268  | 0.016591    | chr7:92340780-92489825|
| ASLNC19615   | 0.0169636| 0.0653  | 0.6   | down        | chr11  | 8785056 | 8787982 | 2926   | 0.0169636   | AK123380|
| ASLNC01454   | 0.0170687| 0.0656  | 0.58  | down        | chr11  | 65021808| 65030513| 8705   | 0.0170687   | NR_002819|
| BG758151     | 0.0173371| 0.0663  | 0.49  | down        | chr12  | 19544329| 19597645| 53316  | 0.0173371   | chr12:19574525-19658050|
| ASLNC02832   | 0.0173501| 0.0663  | 0.59  | down        | chr11  | 1953680 | 1956250 | 2570   | 0.0173501   | HIV2514 |
| ASLNC16653   | 0.0173877| 0.0663  | 0.58  | down        | chr13  | 40068095| 40069344| 1249   | 0.0173877   | AK022351|
| ASLNC19542   | 0.0174939| 0.0666  | 0.64  | down        | chr10  | 14610203| 14612303| 2100   | 0.0174939   | AK123138|
| ASLNC17128   | 0.0179509| 0.068   | 0.64  | down        | chr4   | 16485201| 16488328| 3127   | 0.0179509   | AK024979|
| ASLNC02144   | 0.0179845| 0.068   | 0.63  | down        | chr21  | 43706401| 43722531| 16130  | 0.0179845   | NR_026863|
| ASLNC22607   | 0.0181265| 0.0683  | 0.59  | down        | chr11  | 110790177| 110794121| 3944   | 0.0181265   | BC031895|
| ASLNC24385   | 0.0181616| 0.0684  | 0.55  | down        | chr5   | 41195112| 41196000| 888    | 0.0181616   | J05063  |
| ASLNC14344   | 0.0181662| 0.0684  | 0.62  | down        | chr16  | 258726  | 272085  | 13359  | 0.0181662   | DQ656001|
| ASLNC14724   | 0.0182967| 0.0687  | 0.63  | down        | chr4   | 22007921| 22010046| 2125   | 0.0182967   | BC020926|
| ASLNC18330   | 0.0184277| 0.0691  | 0.55  | down        | chr8   | 30539986| 30543393| 3407   | 0.0184277   | AK091440|
| ASLNC07642   | 0.0187978| 0.0702  | 0.6   | down        | chr8   | 128289292| 128300515| 11223  | 0.0187978   | uc003ysa|
| ASLNC11101   | 0.019467 | 0.0721  | 0.61  | down        | chr16  | 46947777| 47039810| 92033  | 0.019467    | uc002zfl|
| ASLNC24625   | 0.0196133| 0.0725  | 0.58  | down        | chrX   | 152798458| 152798753| 295   | 0.0196133   | X78938  |
| ASLNC03084   | 0.0196133| 0.0725  | 0.6   | down        | chr8   | 7091654 | 7092140 | 486    | 0.0196133   | LIT2085 |
| ASLNC23881   | 0.0196988| 0.0727  | 0.63  | down        | chr20  | 10148059| 10148402| 343    | 0.0196988   | BC107086|
| ASLNC24287   | 0.0202978| 0.0746  | 0.64  | down        | chr3   | 172558052| 172561331| 3279   | 0.0202978   | BX649038|
| Gene       | p-value  | FDR     | Effect | Chromosome | Start | End     | Length | Feature ID |
|------------|----------|---------|--------|------------|-------|---------|--------|------------|
| ASLNC12516| 0.0203547| 0.0747  | 0.59   | chr20      | 773766| 786105  | 12339  | uc010fzz   |
| ASLNC06579| 0.0204085| 0.0748  | 0.63   | chr6       | 32228557| 32230120| 1563   | uc003nzv  |
| ASLNC15878| 0.0207082| 0.0753  | 0.53   | chr13      | 101167198| 101168050| 852    | AF339779  |
| ASLNC11303| 0.0207809| 0.0755  | 0.61   | chr17      | 4331072 | 4336496 | 5424   | uc002fxw  |
| ASLNC20833| 0.0209855| 0.0759  | 0.58   | chr11      | 47333461| 47339247| 5786   | AK128134  |
| T02980    | 0.0215853| 0.0775  | 0.57   | chr22      | 25826979| 25827503| 524    | HMlincRNA1218 |
| ASLNC22001| 0.0220849| 0.0789  | 0.63   | chr12      | 18217  | 19669   | 1452   | AK001150  |
| ASLNC16193| 0.0222837| 0.0795  | 0.59   | chr4       | 57666847| 57668938| 2091   | AF086318  |
| ASLNC15455| 0.0231599| 0.0816  | 0.59   | chr11      | 57135161| 57135619| 458    | AK001092  |
| ASLNC16173| 0.0249836| 0.0859  | 0.57   | chr1       | 56803695| 56809094| 5399   | AK001150  |
| ASLNC17037| 0.0280361| 0.093   | 0.62   | chr19      | 8545978 | 8547054 | 1076   | AK024563  |
| ASLNC17464| 0.0292888| 0.0962  | 0.63   | chr6       | 154821136| 154823043| 1907   | AK027364  |
| ASLNC11173| < 1e-07  | < 1e-07 | 0.16   | chr16      | 55227175| 55228499| 1324   | uc002ejp  |
| ASLNC10036| < 1e-07  | < 1e-07 | 0.17   | chr14      | 105124270| 105401515| 277245 | uc001yrs  |
Supplementary Table S4. List of possible miR503HG-interacting proteins identified by mass spectrometry

| Protein name                                                                 | Gene name          | Molecular weight | PepCount | UniquePepCount |
|------------------------------------------------------------------------------|--------------------|------------------|----------|----------------|
| Poly(rC)-binding protein 2                                                   | PCBP2              | 39               | 17       | 6              |
| ADP/ATP translocase 2                                                        | SLC25A5            | 33               | 11       | 4              |
| ADP/ATP translocase 1                                                         | SLC25A4            | 33               | 10       | 4              |
| Fructose-bisphosphate aldolase B                                             | ALDOB              | 35               | 6        | 3              |
| Heterogeneous nuclear ribonucleoprotein A/B                                  | HNRNPA2B1          | 37               | 4        | 1              |
| L-lactate dehydrogenase B chain                                              | LDHB               | 36               | 6        | 1              |
| Malate dehydrogenase                                                         | MDH2               | 36               | 5        | 3              |
| Heterogeneous nuclear ribonucleoproteins A2/B1                               | HNRNPA2B1          | 37               | 4        | 1              |
| Electron transfer flavoprotein subunit alpha                                 | ETFA               | 30               | 4        | 1              |
| Adenylate kinase 2                                                           | AK2                | 26               | 4        | 1              |
| 3-hydroxyacyl-CoA dehydrogenase type-2                                       | HSD17B10           | 26               | 4        | 1              |
| Glutathione S-transferase A1                                                 | GSTA1              | 26               | 4        | 1              |
| Ezrin                                                                        | EZR                | 70               | 3        | 2              |
| Aspartate aminotransferase                                                   | GOT2               | 43               | 3        | 2              |
| Alcohol dehydrogenase [NADP(+)]                                             | AKR1A1             | 37               | 3        | 1              |
| Fumarate hydratase                                                           | FH                 | 55               | 3        | 1              |
| 40S ribosomal protein S3a                                                     | RPS3A              | 35               | 3        | 1              |
| Serine-threonine kinase receptor-associated protein                           | STRAP              | 38               | 3        | 1              |
| Selenium-binding protein 1                                                   | SELENBP1           | 45               | 2        | 1              |
| Phosphoenolpyruvate carboxykinase                                            | PCK1               | 69               | 2        | 1              |
| T-complex protein 1 subunit                                                   | CCT7               | 59               | 2        | 1              |
| Alpha-aminoadipic semialdehyde dehydrogenase                                | ALDH7A1            | 55               | 2        | 1              |
| Glutathione synthetase                                                       | GSS                | 52               | 1        | 1              |
| Methylcrotonoyl-CoA carboxylase subunit alpha                                | MCCC1              | 76               | 1        | 1              |
| Malate dehydrogenase                                                         | MDH1               | 36               | 1        | 1              |
| Gene                          | Sequence                                      |
|-------------------------------|----------------------------------------------|
| 3’-RACE GSP1                  | 5’ CTGTAAGTCCAAGGAATCCTCTCTCC 3’             |
| 3’-RACE GSP2                  | 5’ CCAATGAGTCAGTACATGATGGGA 3’               |
| 5’-RACE GSP1                  | 5’ ACATTGACACACATCTGTCCA 3’                 |
| 5’-RACE GSP2                  | 5’ TTCCCATCATGACTGACTCAT 3’                 |
| miR503HG full length          | F: 5’ GAAGGTAGAAGGTGGGTCTG 3’                |
|                               | R: 5’ TAACGGAAATCAAAAGCAGCA 3’              |
| miR503HG qPCR                 | F: 5’ CTTGAAGGCATCCAGCATCTC 3’              |
|                               | R: 5’ TTGGGACACTTGGGTGGTTT 3’               |
| miR503HG fragment1            | F: 5’ GCCGGACGCGTGTCTGCCA 3’                |
|                               | R: 5’ GCCGGATGGCAGCGCTGCTG 3’               |
| miR503HG fragment2            | F: 5’ GCCTGCAGGACCAGGAATGT 3’               |
|                               | R: 5’ GCCTTTGAGAGATTTGATGT 3’               |
| miR503HG fragment3            | F: 5’ TTATATGCATTAAAATCTC 3’                |
|                               | R: 5’ ACATTTTTAAAGGATGATAA 3’               |
| miR503HG fragment4            | F: 5’ TGTTCCCACAACCATCTC 3’                 |
|                               | R: 5’ CTGTGACCTGTCTGACA 3’                  |
| miR503HG fragment5            | F: 5’ AAAAGCCAGTGTCACAATCT 3’               |
|                               | R: 5’ AAAAGCACATACAGTCTAC 3’                |
| U1 snRNA                      | F: 5’ GGGAGATACCATGATCAGGAAGGT 3’           |
|                               | R: 5’ CCACAAATTATGCGAGTCTGTTCCC 3’          |
| β-actin                       | F: 5’ AGTTGCGTTACACCTTTTCTTG 3’             |
|                               | R: 5’ GCTGTCACCTTCACCGTCCC 3’               |
| HNRNPA2B1 full-length         | F: 5’ ATGGAGAGAGAACAGGAAC 3’                |
|                               | R: 5’ TCAGTATCGGCTCTCC 3’                   |
| HNRNPA2B1 qPCR                | F: 5’ GGAGTGGAAGAGAGGAAC 3’                 |
|                               | R: 5’ CAGGTCTCTCCATACCCA 3’                 |
| Gene                  | Forward (5') Sequence | Reverse (3') Sequence |
|-----------------------|-----------------------|-----------------------|
| HNRNPA2B1 fragment1   | 5' ATGGAGAGAGAAAGGAACAG | 3' TCAAGATCCTCCTCTAAAGTT |
| HNRNPA2B1 fragment2   | 5' GATGGATATGGCAGTGACGT | 3' TCAGTATCGGCTCTCCACC |
| JAK2                  | 5' TGGGGTTTTCTGGTGCTTT | 3' TAGAGGGTACATTACGGCA |
| STAT3                 | 5' AGCAGCACCTTCAGGATGTC | 3' GCATCTTCTGCTGGTCACT |
| JNK                   | 5' GTTGGGTGCACTAGGCCGA | 3' CGGGTGTTGGAGGATTCAT |
| ERK1/2                | 5' AACAGGCCCATCTTTTCCAG | 3' CCAGACCTTTTGGAGTAC |
| β-catenin             | 5' ATGACTCGAGCTCAGAGGT | 3' ATTCACGTGGTGGCAAGTT |
| p52                   | 5' CTACTCGACTACGGCGTCAC | 3' GAGTCTCCATGCGATCCAG |
| p65                   | 5' ATAGAAGAGCAGCTGGGGA | 3' GCCTGGTCCCGTGAAATACA |
| Abca1                 | 5' GGAGGGAGAGCAACAGGGCT | 3' GCTCGCAATTTACGGGGT |
| Cyp7a1                | 5' TTACAAGGGCGGCAACACAG | 3' GGAATGGTCTTGTGCTT |
| miR503 probe          | 5' UAGCAGCGGGAACAGUUCUGCAG | |
| miR503HG siRNA-1#     | 5' GGACAUUGAAUGACUGUAUTT | |
| miR503HG siRNA-2#     | 5' GCAGUGGUACAAACUCUGUTT | |
| HNRNPA2B1 siRNA       | 5' GAAAAUCACUAACUCAAUTT | 3' AUUGAUGGUACUAGUAAAUTT |
| siRNA control (NC)    | 5' UUCUCGGAACGUUGUCACGUTT | |
| miR503 mimics | 5' ACGUGACACGUUCGGAGAATT 3' |
|-------------|-----------------------------|
| miR503 inhibitor | 5' UAGCAGCGGGAACAGUUCUGCAG 3' |
|             | 5' CUQCAGAACUGUUCGCUGCUA 3' |
### Supplementary Table S6. Antibodies used in this study

| Protein                  | Cat no.     | Company | source | KD    |
|--------------------------|-------------|---------|--------|-------|
| HNRNPA2B1                | SC-374052   | Santa cruz | Mouse  | 34-40 |
| HA                      | 3724        | CST     | Rabbit | /     |
| p52                     | 4882        | CST     | Rabbit | 52    |
| p65                     | sc-372      | Santa cruz | Rabbit | 65    |
| p-p65(S536)             | 3033s       | Santa cruz | Rabbit | 65    |
| JAK2                    | 17670-1-AP  | Proteintech | Rabbit | 125   |
| p-JAK2 (Tyr1007)        | 4406        | CST     | Rabbit | 125   |
| STAT3                   | 10253-2-AP  | Proteintech | Rabbit | 86    |
| p-STAT3(S727)           | 9134P       | CST     | Rabbit | 86    |
| JNK                     | 51151-1-AP  | Proteintech | Rabbit | 48    |
| p-JNK(Thr183/Tyr185)    | 4668        | CST     | Rabbit | 48    |
| ERK1/2                  | 16443-1-AP  | Proteintech | Rabbit | 38-44 |
| p-ERK1/2(Thr202/Tyr204) | 4377        | CST     | Rabbit | 44    |
| β-catenin               | 17561-1-AP  | Proteintech | Rabbit | 92    |
| c-Myc                   | 5605        | CST     | Rabbit | 57-65 |
| EZH2                    | 21800-1-AP  | Proteintech | Rabbit | 86    |
| COX2                    | ab52237     | abcam   | Rabbit | 69    |
| VCAM1                   | sc-13160    | Santa cruz | Mouse  | 95    |
| Lamin B1                | 13435       | CST     | Rabbit | 68    |
| GAPDH                   | 5174        | CST     | Rabbit | 37    |
| Protein  | Catalog | Source   | Species | ID  |
|----------|---------|----------|---------|-----|
| ARHGEF19 | sc-137301 | Santa cruz | Goat | 89 |
| β-actin | A5441 | Sigma | Mouse | 43 |