Supplemental material

Ahmed et al., http://www.jcb.org/cgi/content/full/jcb.201404001/DC1

Figure S1. Characterization of the skin phenotype in K14-rtTA/miR-214-TRE mice and validation of miR-214 predicted targets in the keratinocytes. (A) Real-time RT-PCR. There was a significant increase in Lor but not K10 expression in the neonatal back skin epithelium of the DTG versus WT mice. n = 3 mice/genotype. (B–D) Induction of miR-214 transgene by Dox after E10. (B) A comparison of HF length in DTG and WT mice at P8. Significantly shorter HFs were seen in the DTG versus WT mice. n = 3 mice/genotype. (C) Significantly reduced total skin in DTG versus WT mice at P8. n = 3 mice/genotype. (D) Length of different hair shaft types (in micrometers) in DTG and WT mice plucked at P20, the time of the first telogen phase. No differences were found. n = 4 mice/genotype. (E) Immunofluorescence detection of active caspase-3 (red) with nuclear staining (DAPI, blue) in anagen HFs. No difference in a-caspase-3 between DTG and WT HFs was detected. (F) Real-time RT-PCR. A significant decrease in Shh transcript levels in skin of DTG versus WT mice was seen at E17 after miR-214 induction by Dox after E10. n = 3 mice/genotype. (G) Immunofluorescence analysis of Cyclin d1 expression in the epidermis. There was a significant decrease in the number of Cyclin D1+ cells in the DTG epidermis versus WT mice. (H) Immunofluorescence analysis of Lhx2 and Sox9 (red) with nuclear staining (DAPI, blue) in HF placodes of DTG and WT mice at E17. No difference in Lhx2 and Sox9 expression was detected. (I) Immunodetection of Sox2 (red) with nuclear staining (DAPI, blue) in the dermal papilla of anagen DTG and WT HFs after overexpression of miR-214 in telogen skin. No difference in Sox2 staining was observed. (J) Immunodetection of Dlx3 (green) with nuclear staining (DAPI, blue) in the anagen DTG and WT HFs after overexpression of miR-214 in telogen skin. There was a decrease in Dlx3 expression in DTG HFs. (K) Bioinformatic analysis of predicted miR-214 target genes that are differentially expressed in DTG epithelium after 48 h of Dox activation. (L) Predicted interactions between miR-214 and Shh. The alignment of the mouse miR-214 sequence in the 3' UTR of Shh mRNA is shown. (M) There were no changes in luciferase activity in HaCaT cells due to cotransfection with miR-214 mimic and the Shh 3' UTR constructs encompassing the putative miR-214 target site. The data shown are from a single representative experiment out of three repeats. For the experiment shown, n = 2. (N) Western blot. There were reduced β-catenin levels in primary epidermal keratinocytes transfected with miR-214 compared with the control, as well as reduced β-catenin levels in the keratinocytes cotreated with LiCl and miR-214 mimic compared to the cells treated with LiCl alone. Data are presented as mean ± SD (error bars); *, P < 0.05; **P < 0.001; Student's t test. Bars: (E, G, and H) 25 µm; (I and J) 50 µm.
Table S1 - Genes that show 2-fold down-regulation in the keratinocytes of K14rtTA/TRE-miR-214 mice versus WT mice

| Accession Number | Gene name | Symbol | Fold change |
|------------------|-----------|--------|-------------|
| NM_011302        | retinoschisis (X-linked, juvenile) 1 | Rs1    | 5.25        |
| NM_178596        | gap junction protein, delta 3       | Gjd3   | 4.73        |
| NM_010708        | lectin, galactose binding, soluble 9, transcript variant 1 | Lgals9 | 4.27        |
| NM_010327        | glycopolypeptide, transcript variant 2 | Gp1bb  | 3.93        |
| NM_010577        | integrin alpha 5                    | Itga5  | 3.73        |
| NM_181277        | collagen, type XIV, alpha 1         | Col14a1| 3.15        |
| NM_001081249     | versican, transcript variant 1      | Vcan   | 2.90        |
| NM_020486        | basal cell adhesion molecule        | Bcam   | 2.77        |
| NM_021334        | integrin alpha X                    | Itgax  | 2.72        |
| NM_146007        | collagen, type VI, alpha 2          | Col6a2 | 2.68        |
| NM_010386        | histocompatibility 2, class II, locus DMA | H2-DMa | 2.64        |
| NM_013565        | integrin alpha 3                    | Itga3  | 2.58        |
| NM_011150        | lectin, galactoside-binding, soluble, 3 binding protein | Lgals3bp | 2.56        |
| NM_023051        | calyxtenin 1                        | Clstn1 | 2.50        |
| NM_007992        | fibulin 2, transcript variant 1      | Fbln2  | 2.44        |
| NM_178685        | protocadherin 20                    | Pcdh20 | 2.43        |
| NM_010181        | fibrillin 2                         | Fbn2   | 2.35        |
| NM_001082960     | integrin alpha M, transcript variant 1 | Itgam  | 2.32        |
| NM_013552        | hyaluronan mediated motility receptor (RHAMM) | Hmmr   | 2.18        |
| NM_010180        | fibulin 1                           | Fbn1   | 2.01        |

Adhesion/Extracellular matrix

| Accession Number | Gene name | Symbol | Fold change |
|------------------|-----------|--------|-------------|
| NM_018754        | stratifin | Sfn    | 3.34        |
| NM_177372        | DNA replication helicase 2 homolog | Dna2 | 3.28        |
| NM_007631        | cyclin D1* | Ccnd1  | 3.76        |
| NM_008564        | minichromosome maintenance deficient 2 mitotin | Mcm2 | 2.91        |
| NM_028131        | centromere protein N | Cenpn | 2.88        |

Cell Cycle/Apoptosis

| Accession Number | Gene name | Symbol | Fold change |
|------------------|-----------|--------|-------------|
| NM_010059        | DMC1 dosage suppressor of mck1 homolog, meiosis-specific homologous recombination | Dmc1 | 2.78        |
| NM_028222        | cyclin-dependent kinase inhibitor 3 | Cdkn3 | 2.72        |
| NM_008014        | protein phosphatase 1G (formerly 2C), magnesium-dependent, gamma isoform | Ppm1g | 2.65        |
| NM_027263        | apoptosis-inducing, TAF9-like domain 1 | Apid1 | 2.60        |
| NM_001012273     | baculoviral IAP repeat-containing 5, transcript variant 3 | Birc5 | 2.51        |
| NM_198654        | NSL1, MIND kinetochore complex component, homolog | Nsl1 | 2.50        |
| NM_011015        | origin recognition complex, subunit 1, transcript variant A | Orc1 | 2.43        |

| Accession Number | Gene name | Symbol | Fold change |
|------------------|-----------|--------|-------------|
| NM_027954        | synaptonemal complex central element protein 2, transcript variant 2 | Syce2 | 2.42        |
| NM_019499        | MAD2 mitotic arrest deficient-like 1 | Mad2lf1 | 2.33        |
| NM_022654        | leucine-rich and death domain containing minichromosome maintenance deficient 5, cell division cycle 46 | Lrd | 2.33        |
| NM_008566        | cell division cycle associated 8 | Cdc8a | 2.28        |
| NM_009828        | cyclin A2 | Ccn2a | 2.27        |
| NM_198605        | spindle and kinetochore associated complex subunit 3 | Ska3 | 2.26        |
| NM_001042421     | kinetochore associated 1 | Kntc1 | 2.25        |

| Accession Number | Gene name | Symbol | Fold change |
|------------------|-----------|--------|-------------|
| NM_146235        | excision repair cross-complementing rodent repair deficiency complementation group 6 like | Ercc6l | 2.23        |
| NM_001159930     | centromere protein L , transcript variant 1 | Cenpl | 2.19        |
| Accession | Description | Symbol | Value |
|-----------|-------------|--------|-------|
| NM_007900 | ect2 oncogene, transcript variant 1 | Ect2 | 2.18  |
| NM_007659 | cyclin-dependent kinase 1* | Cdk1 | 2.64  |
| NM_013929 | SIVA1, apoptosis-inducing factor, transcript variant 1 | Siva1 | 2.15  |
| NM_011049 | cyclin-dependent kinase 16 | Cdk16 | 2.15  |
| NM_172301 | cyclin B1* | Ccnb1 | 2.36  |
| NM_001014976 | extra spindle poles-like 1 | Espl1 | 2.15  |
| NM_025995 | F-box protein 5 | Fbxo5 | 2.14  |
| NM_011799 | cell division cycle 6, transcript variant 1 | Cdc6 | 2.07  |
| NM_027290 | minichromosome maintenance deficient 10 | Mcm10 | 2.05  |
| NM_025866 | cell division cycle associated 7 | Cdc7 | 2.05  |
| NM_016881 | checkpoint kinase 2 | Chek2 | 2.04  |
| NM_008567 | minichromosome maintenance deficient 6 | Mcm6 | 2.03  |
| NM_007630 | cyclin B2 | Ccnb2 | 2.02  |
| NM_010931 | ubiquitin-like, containing PHD and RING finger domains, 1, transcript variant 1 | Uhrf1 | 2.72  |
| NM_175653 | histone cluster 1, H3c | Hist1h3c | 2.66  |
| NM_178856 | GINS complex subunit 2 (Psf2 homolog) | Gins2 | 2.66  |
| NM_012012 | exounuclease 1 | Exo1 | 2.62  |
| NM_001204973 | bromodomain containing 2, transcript variant 2 | Brd2 | 2.56  |
| NM_017663 | centromere protein K, transcript variant 1 | Cenpk | 2.55  |
| NM_11234 | RAD51 homolog | Rad51 | 2.53  |
| NM_020022 | replication factor C (activator 1) 2 | Rfc2 | 2.51  |
| NM_178183 | histone cluster 1, H2ak | Hist1h2ak | 2.46  |
| NM_008210 | H3 histone, family 3A | H3f3a | 2.40  |
| NM_011623 | topoisomerase (DNA) II alpha | Top2a | 2.38  |
| NM_001163775 | TAO kinase 2, transcript variant 2 | Taok2 | 2.37  |
| NM_181586 | SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2, transcript variant 3 | Smarcc2 | 2.35  |
| NM_198160 | ASF1 anti-silencing function 1 homolog B | Asf1b | 2.33  |
| NM_024184 | ASF1 anti-silencing function 1 homolog B | Asf1b | 2.33  |
| NM_028039 | establishment of cohesion 1 homolog 2 | Esco2 | 2.33  |

**Chromatin remodelling**

| Accession | Description | Symbol | Value |
|-----------|-------------|--------|-------|
| NM_178215 | MAP/microtubule affinity-regulating kinase 2, transcript variant 1 | Mark2 | 4.42  |
| NM_008567 | histone cluster 1, H4c | Hist1h4c | 3.91  |
| NM_175652 | histone cluster 4, H4 | Hist4h4 | 3.84  |
| NM_001080819 | AT rich interactive domain 1A | Arid1a | 3.77  |
| NM_030609 | histone cluster 1, H1a | Hist1h1a | 3.51  |
| NM_026785 | ubiquitin-conjugating enzyme E2C | Ube2c | 3.39  |
| NM_020034 | histone cluster 1, H1b | Hist1h1b | 3.39  |
| NM_015787 | histone cluster 1, H1e | Hist1h1e | 3.28  |
| NM_033596 | histone cluster 2, H4 | Hist2h4 | 3.17  |
| NM_016957 | high mobility group nucleosomal binding domain 2 | Hmg2 | 3.13  |
| NM_001195421 | histone cluster 1, H4m | Hist1h4m | 3.01  |
| NM_013548 | histone cluster 1, H3f | Hist1h3f | 2.90  |
| NM_145073 | histone cluster 1, H3g | Hist1h3g | 2.84  |
| NM_010931 | ubiquitin-like, containing PHD and RING finger domains, 1, transcript variant 1 | Uhrf1 | 2.72  |
| NM_175653 | histone cluster 1, H3c | Hist1h3c | 2.66  |
| NM_178856 | GINS complex subunit 2 (Psf2 homolog) | Gins2 | 2.66  |
| NM_012012 | exounuclease 1 | Exo1 | 2.62  |
| NM_001204973 | bromodomain containing 2, transcript variant 2 | Brd2 | 2.56  |
| NM_021790 | centromere protein K, transcript variant 1 | Cenpk | 2.55  |
| NM_175663 | histone cluster 1, H2ba | Hist1h2ba | 2.54  |
| NM_011234 | RAD51 homolog | Rad51 | 2.53  |
| NM_020022 | replication factor C (activator 1) 2 | Rfc2 | 2.51  |
| NM_178183 | histone cluster 1, H2ak | Hist1h2ak | 2.46  |
| NM_008210 | H3 histone, family 3A | H3f3a | 2.40  |
| NM_011623 | topoisomerase (DNA) II alpha | Top2a | 2.38  |
| NM_001163775 | TAO kinase 2, transcript variant 2 | Taok2 | 2.37  |
| NM_181586 | SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2, transcript variant 3 | Smarcc2 | 2.35  |
| NM_198160 | ASF1 anti-silencing function 1 homolog B | Asf1b | 2.33  |
| NM_024184 | ASF1 anti-silencing function 1 homolog B | Asf1b | 2.33  |
| NM_028039 | establishment of cohesion 1 homolog 2 | Esco2 | 2.33  |
| Gene ID       | Description                                                                 | Symbol | Value |
|--------------|-----------------------------------------------------------------------------|--------|-------|
| NM_145946    | Fanconi anemia, complementation group I                                      | Fanci  | 2.31  |
| NM_178200    | histone cluster 1, H2bm                                                      | Hist1h2bm | 2.24  |
| NM_009030    | retinoblastoma binding protein 4                                            | Rbbp4  | 2.23  |
| NM_008894    | polymerase (DNA directed), delta 2, regulatory subunit                       | Pold2  | 2.20  |
| NM_008228    | histone deacetylase 1                                                       | Hdac1  | 2.20  |
| NM_013883    | sex comb on midleg homolog 1, transcript variant 1                          | Scmh1  | 2.18  |
| NM_020004    | K(lysine) acetyltransferase 2A, transcript variant 1                        | Kat2a  | 2.16  |
| NM_011121    | polo-like kinase 1                                                           | Plk1   | 2.16  |
| NM_146208    | regulator of chromosome condensation and BTB (POZ)                          | Neil3  | 2.16  |
| NM_134083    | domain containing protein 2, transcript variant 2                           | Rcbtb2 | 2.13  |
| NM_008892    | polymerase (DNA directed), alpha 1                                          | Pola1  | 2.11  |
| NM_029797    | meiotic nuclear divisions 1 homolog                                         | Mnd1   | 2.10  |
| NM_013550    | histone cluster 1, H3a                                                      | Hist1h3a | 2.10 |
| NM_010722    | lamin B2                                                                   | Lmnb2  | 2.09  |
| NM_026632    | replication protein A3                                                       | Rpa3   | 2.08  |
| NM_153141    | coactivator-associated arginine methyltransferase 1, transcript variant 2   | Carm1  | 2.07  |
| NM_023294    | NDC80 homolog, kinetochore complex component                                | Ndc80  | 2.05  |
| NM_172453    | PIF1 5'-to-3' DNA helicase homolog                                          | Pif1   | 2.05  |
| NM_009013    | RAD51 associated protein 1                                                   | Rad51ap1 | 2.03 |
| NM_008017    | structural maintenance of chromosomes 2                                     | Smc2   | 1.98  |

**Cytoskeleton**

| Gene ID      | Description                                                                 | Symbol | Value |
|--------------|-----------------------------------------------------------------------------|--------|-------|
| NM_011072    | profilin 1                                                                  | Pfn1   | 3.96  |
| NM_010669    | keratin 6B                                                                   | Krt6b  | 3.94  |
| NM_009451    | tubulin, beta 4A class IVA                                                  | Tubb4a | 3.93  |
| NM_00116337  | janus kinase and microtubule interacting protein 2                           | Jakmip2 | 3.39 |
| NM_009449    | tubulin, alpha 3B                                                           | Tuba3b | 3.34  |
| NM_008445    | kinesin family member 3C                                                    | Kif3c  | 2.92  |
| NM_130857    | keratin associated protein 19-3                                              | Krtap19-3 | 2.92 |
| NM_183296    | keratin associated protein 16-3                                              | Krtap16-3 | 2.92 |
| NM_016879    | keratin 85                                                                  | Krt85  | 2.90  |
| NM_011526    | transgelin                                                                  | Tagln  | 2.88  |
| NM_00116315  | keratin associated protein 20-2                                              | Krtap20-2 | 2.81 |
| NM_130870    | keratin associated protein 16-1                                              | Krtap16-1 | 2.81 |
| NM_175272    | neuron navigator 2, transcript variant 1                                    | Nav2   | 2.76  |
| NM_001113406 | keratin associated protein 11-1                                              | Krtap11-1 | 2.70 |
| NM_019445    | formin 2                                                                    | Fmn2   | 2.68  |
| NM_148934    | tubulin polyglutamylase complex subunit 1                                   | Tpgs1  | 2.64  |
| NM_010672    | keratin associated protein 6-1                                               | Krtap6-1 | 2.64 |
| NM_028621    | keratin associated protein 21-1                                              | Krtap21-1 | 2.62 |
| NM_019641    | stathmin 1                                                                  | Stmn1  | 2.60  |
| NM_027771    | keratin associated protein 7-1                                               | Krtap7-1 | 2.58 |
| NM_130873    | keratin associated protein 19-4                                              | Krtap19-4 | 2.57 |
| NM_010626    | kinesin family member 7                                                     | Kif7   | 2.50  |
| NM_009931    | collagen, type IV, alpha 1                                                  | Col4a1 | 2.42  |
| NM_001024716 | TRIO and F-actin binding protein, transcript variant 1                       | Triobp | 2.41  |
| NM_010662    | keratin 13                                                                  | Krt13  | 2.38  |
| NM_026552    | actin related protein 2/3 complex, subunit 4, transcript variant 1          | Arpc4  | 2.37  |
| NM_013928    | schwannomin interacting protein 1, transcript variant 4                     | Schip1 | 2.34  |
| NM_172946    | keratin 222                                                                 | Krt222 | 2.32  |
| NM_011654    | tubulin, alpha 1B                                                           | Tuba1b | 2.29  |
| NM_001166157 | keratin 81                                                                  | Krt81  | 2.29  |
| NM_017470    | dynein, axonemal, light chain 4                                              | Dnalc4 | 2.29  |
| NM_027800    | keratin associated protein 2-4                                               | Krtap2-4 | 2.28 |

Cytoskeleton:

- **Profilin 1** (Pfn1): 3.96
- **Keratin 6B** (Krt6b): 3.94
- **Tubulin, beta 4A class IVA** (Tubb4a): 3.93
- **Janus kinase and microtubule interacting protein 2** (Jakmip2): 3.39
- **Keratin 85** (Krt85): 2.90
- **Transgelin** (Tagln): 2.88
- **Keratin associated protein 20-2** (Krtap20-2): 2.81
- **Keratin associated protein 16-1** (Krtap16-1): 2.81
- **Neuron navigator 2, transcript variant 1** (Nav2): 2.76
- **Keratin associated protein 11-1** (Krtap11-1): 2.70
- **Formin 2** (Fmn2): 2.68
- **Tubulin polyglutamylase complex subunit 1** (Tpgs1): 2.64
- **Keratin associated protein 6-1** (Krtap6-1): 2.64
- **Keratin associated protein 21-1** (Krtap21-1): 2.62
- **Stathmin 1** (Stmn1): 2.60
- **Keratin associated protein 7-1** (Krtap7-1): 2.58
- **Keratin associated protein 19-4** (Krtap19-4): 2.57
- **Kinesin family member 7** (Kif7): 2.50
- **Collagen, type IV, alpha 1** (Col4a1): 2.42
- **TRIO and F-actin binding protein, transcript variant 1** (Triobp): 2.41
- **Keratin 13** (Krt13): 2.38
- **Actin related protein 2/3 complex, subunit 4, transcript variant 1** (Arpc4): 2.37
- **Schwannomin interacting protein 1, transcript variant 4** (Schip1): 2.34
- **Keratin 222** (Krt222): 2.32
- **Keratin 81** (Krt81): 2.29
- **Dynein, axonemal, light chain 4** (Dnalc4): 2.29
- **Keratin associated protein 2-4** (Krtap2-4): 2.28
| Gene ID       | Gene Name                                      | Description                                           | Log2 Fold Change |
|--------------|-----------------------------------------------|-------------------------------------------------------|------------------|
| NM_010676    | keratin associated protein 19-5               | Krtap19-5                                             | 2.27             |
| NM_212483    | keratin 42                                     | Krt42                                                 | 2.26             |
| NM_198599    | MAP6 domain containing 1                      | Map6d1                                                | 2.25             |
| NM_197945    | ProSAPIp1 protein                             | ProSapp1                                              | 2.24             |
| NM_145575    | caldesmon 1                                   | Cald1                                                 | 2.20             |
| NM_017464    | neural precursor cell expressed, developmentally down-regulated gene 9, transcript variant 2 | Nedd9                                                 | 2.19             |
| NM_019670    | diaphanous homolog 3                          | Diap3                                                 | 2.18             |
| NM_080728    | myosin, heavy polypeptide 7, cardiac muscle, beta | Myh7                                                  | 2.16             |
| NM_134471    | kinesin family member 2C                      | Kif2c                                                 | 2.14             |
| NM_009768    | basigin, transcript variant 1                  | Bsg                                                   | 2.14             |
| NM_028390    | anillin, actin binding protein                 | Anln                                                  | 2.13             |
| NM_001191018 | keratin associated protein 22-2               | Krtap22-2                                             | 2.11             |
| NM_133851    | vimentin-type intermediate filament associated coiled-coil protein, transcript variant 1 | Vmac                                                 | 2.01             |
| NM_178926    | keratin associated protein 8-1                | Krtap8-1                                              | 1.98             |
|               | **Metabolism**                                |                                                       |                  |
| NM_016956    | hemoglobin, beta adult minor chain             | Hbb-b2                                                | 14.97            |
| NM_001080943 | zinc finger, DHHC-type containing 22          | Zdhc22                                                | 13.25            |
| NM_009653    | aminolevulinic acid synthase 2, erythroid, transcript variant 1 | Alas2                                                | 8.62             |
| NM_008220    | hemoglobin, beta adult major chain             | Hbb-b1                                                | 8.30             |
| NM_008218    | solute carrier family 6 (neurotransmitter transporter), member 20A | Hba-a1                                               | 6.67             |
| NM_198599    | cytochrome P450, family 2, subfamily d, polypeptide 11 | Cyp2d11                                              | 4.17             |
| NM_001082975 | uncoupling protein 3 (mitochondrial, proton carrier) | Sdr39u1                                               | 4.59             |
| NM_001033270 | uncoupling protein 2 (mitochondrial, proton carrier) | Ucp3                                                  | 4.46             |
| NM_011671    | NADH dehydrogenase (ubiquinone) complex I, assembly factor 5 | Slc4a7                                               | 4.43             |
| NM_007817    | cytochrome P450, family 2, subfamily f, polypeptide 2 | Cyp2f2                                                | 3.46             |
| NM_010359    | glutathione S-transferase, mu 3               | Gstm3                                                 | 3.37             |
| NM_175403    | malecin                                       | Mlec                                                  | 3.34             |
| NM_134118    | trans-2,3-enoyl-CoA reductase , transcript variant 1 | Tcr                                                  | 3.31             |
| NM_007807    | cytochrome b-245, beta polypeptide             | Cybb                                                  | 3.31             |
| NM_177186    | solute carrier family 35, member E2           | Slc35e2                                                | 3.26             |
| NM_013784    | phosphatidylinositol glycan anchor biosynthesis, class N | Pign                                                | 3.22             |
| NM_009034    | retinol binding protein 2, cellular           | Rbp2                                                  | 3.15             |
| NM_011371    | ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgalactosaminide alpha-2,6-sialyltransferase 1 | St6galnac                                         | 3.15             |
| NM_016966    | 3-phosphoglycerate dehydrogenase              | Phgdh                                                 | 3.09             |
| NM_009181    | ST8 alpha-N-acetyl-neuraminyl alpha-2,8-sialyltransferase 2 | St8sia2                                             | 3.03             |
| NM_026969    | Sec31 homolog A                               | Sec31a                                                 | 2.98             |
| NM_001243052 | branched chain aminotransferase 2, mitochondrial, transcript variant 2 | Bcat2                                                | 2.94             |
| NM_027790    | dehydrogenase/reductase member 2              | Dhrs2                                                  | 2.91             |
| Accession | Description                                                                 | Symbol | Rank |
|-----------|-----------------------------------------------------------------------------|--------|------|
| NM_133189 | calcium channel, voltage-dependent, gamma subunit 7                         | Cacng7 | 2.85 |
| NM_144845 | UDP glycosyltransferases 3 family, polypeptide A2                            | Ugt3a2 | 2.84 |
| NM_008525 | aminolevulinate, delta-, dehydratase                                        | Alad   | 2.84 |
| NM_178788 | dCMP deaminase (Dctd), transcript variant 1                                 | Dctd   | 2.81 |
| NM_011961 | procollagen lysine, 2-oxoglutarate 5-dioxygenase 2, transcript variant 2    | Plod2  | 2.79 |
| NM_001033175 | ceroid-lipofuscinosis, neuronal 6                                          | Cln6   | 2.78 |
| NM_213733 | aminopeptidase-like 1                                                       | Npepl1 | 2.76 |
| NM_030601 | chloride channel calcium activated 2                                        | Cica2  | 2.72 |
| NM_207161 | 2'-deoxynucleoside 5'-phosphate N-hydrolase 1                               | Dnph1  | 2.69 |
| NM_009437 | thiosulfate sulfurtransferase, mitochondrial                               | Tst    | 2.68 |
| NM_009723 | ATPase, Ca++ transporting, plasma membrane 2, transcript variant 1          | Atp2b2 | 2.67 |
| NM_019435 | NADH dehydrogenase (ubiquinone) 1 beta subcomplex, transcript variant 1    | Ndub11 | 2.65 |
| NM_009374 | transglutaminase 3                                                          | Tgm3   | 2.62 |
| NM_146198 | solute carrier family 5 (sodium/glucose cotransporter), member 11           | Slc5a11| 2.59 |
| NM_025412 | pyrroline-5-carboxylate reductase-like                                      | Pycrl  | 2.55 |
| NM_033617 | ATPase, H+ transporting, lysosomal V0 subunit B                             | Atp6v0b| 2.53 |
| NM_145603 | carboxylesterase 2C                                                          | Ces2c  | 2.51 |
| NM_008631 | metallothionein 4                                                           | Mt4    | 2.46 |
| NM_009272 | ATPase, H+ transporting, lysosomal V0 subunit B                             | Atp2b2 | 2.67 |
| NM_009104 | ribonucleotide reductase M2                                                  | Rrm2   | 2.38 |
| NM_1163359 | fidgetin-like 1, transcript variant 1                                       | Fign1  | 2.34 |
| NM_009804 | catalase                                                                    | Cat    | 2.32 |
| NM_01044308 | calcium channel, voltage-dependent, alpha 1 subunit                        | Cacna1i| 2.40 |
| NM_009662 | arachidonate 5-lipoxygenase                                                 | Alox5  | 2.38 |
| NM_001163359 | ATPase, H+ transporting, lysosomal V0 subunit B                           | Atp6v0b| 2.53 |
| NM_009127 | stearoyl-Coenzyme A desaturase 1                                            | Scd1   | 2.28 |
| NM_010497 | isocitrate dehydrogenase 1 (NADP+), soluble, transcript variant 2           | Idh1   | 2.32 |
| NM_008826 | phosphofructokinase, liver, B-type                                          | Pfkl   | 2.31 |
| NM_009127 | alkaline ceramidase 3                                                       | Acer3  | 2.26 |
| NM_001271544 | solute carrier family 16 (monocarboxylic acid transporters), member 13    | Slc16a13| 2.28 |
| NM_054094 | acyl-CoA synthetase medium-chain family member 1                           | Acs1m  | 2.27 |
| NM_025408 | stearyl-Coenzyme A desaturase 1                                             | Scd1   | 2.28 |
| NM_001271544 | solute carrier family 16 (monocarboxylic acid transporters), member 13    | Slc16a13| 2.28 |
| NM_026764 | glutathione S-transferase, mu 4 , transcript variant 1                      | Gstm4  | 2.25 |
| NM_1172117 | glucokinase (Gpd2), mitochondrial                                           | Gpd2   | 2.24 |
| NM_010274 | glutathione S-transferase, mu 1                                             | Gstm1  | 2.22 |
| NM_010358 | hydroxyprostaglandin dehydrogenase 15                                      | Hpdg   | 2.22 |
| NM_008278 | angiotensin-converting enzyme-like 4                                         | Angptl4| 2.21 |
| NM_172117 | ectonucleoside triphosphate diphosphohydrolase 6                           | Entpd6 | 2.15 |
| NM_026678 | biliverdin reductase A                                                      | Blvra  | 2.15 |
| NM_013541 | glutathione S-transferase, pi 1                                             | Gsts1  | 2.07 |
| NM_011962 | procollagen-lysine, 2-oxoglutarate 5-dioxygenase 3                          | Plod3  | 2.07 |
| NM_016666 | aryl-hydrocarbon receptor-interacting protein                               | Aip    | 2.06 |
| Gene ID          | Gene Name                                      | Symbol | Fold Change |
|-----------------|-----------------------------------------------|--------|-------------|
| NM_007646      | CD38 antigen                                   | Cd38   | 2.05        |
| NM_028638      | glutamate decarboxylase-like 1                | Gdh    | 2.05        |
| NM_007379      | ATP-binding cassette, sub-family A, member 2  | Abca2  | 2.04        |
| NM_178086      | fatty acid 2-hydroxylase                       | Fad2h  | 2.02        |
| NM_019501      | prenyl (solanesyl) diphosphate synthase, subunit 1 | Pdes1 | 2.01        |
| NM_008212      | hydroxyl-Coenzyme A dehydrogenase             | Hadc   | 2.01        |
| NM_026947      | enoyl-Coenzyme A delta isomerase 3            | Eci3   | 2.00        |
| NM_138665      | sarcosine dehydrogenase                       | Sardh  | 2.00        |
| NM_011977      | solute carrier family 27 (fatty acid transporter), member 1 | Slc27a1 | 2.00 |
| Others         |                                               |        |             |
| NM_001201391   | hemoglobin subunit beta-1-like                | Beta-s | 2.945       |
| NM_023900      | pleckstrin homology domain containing, family J member 1 | Plekhj1 | 5.60        |
| NM_011174      | proline rich protein HaelII subfamily 1       | Prh1   | 5.44        |
| NM_021384      | radical S-adenosyl methionine domain containing 2 | Rsad2 | 4.67        |
| NM_138602      | PRA1 domain family 2                          | Praf2  | 4.14        |
| NM_001042451   | synuclein, alpha, transcript variant 1        | Snca   | 4.05        |
| NM_013877      | calcium binding protein 5                     | Cap5   | 3.98        |
| NM_201518      | fibronectin leucine rich transmembrane protein 2 | Flt2 | 3.83        |
| NM_177994      | R3H domain containing 4                       | R3hdm4 | 3.80        |
| NM_001205102   | leucine-rich repeat, immunoglobulin-like and transmembrane domains 3 | Lrit3 | 3.76        |
| NM_018803      | synaptotagmin X                               | Syt10  | 3.74        |
| NM_029000      | GTPase, very large interferon inducible 1, transcript variant 1 | Gvin1 | 3.73        |
| NM_207105      | histocompatibility 2, class II antigen A, beta 1 | H2-Ab1 | 3.62        |
| NM_001033478   | family with sequence similarity 47, member E, transcript variant 1 | Fam47e | 3.53        |
| NM_001081418   | glioma tumor suppressor candidate region gene 1 | Gtscr1 | 3.53        |
| NM_145981      | phytanoyl-CoA hydroxylating protein            | Phyhp  | 3.26        |
| NM_021898      | testis specific gene A8                       | Tsga8  | 3.11        |
| NM_134122      | nurim (nuclear envelope membrane protein)      | Nrm    | 3.06        |
| NM_001163614   | achaete-scute complex homolog 4               | Ascl4  | 3.04        |
| NM_020583      | interferon-stimulated protein, transcript variant 1 | Isg20 | 2.98        |
| NM_173862      | family with sequence similarity 83, member A   | Fam83a | 2.94        |
| NM_175427      | family with sequence similarity 163, member B  | Fam163b | 2.91       |
| NM_001082545   | stefin A2                                     | Stfa2  | 2.77        |
| NM_183187      | family with sequence similarity 107, member A  | Fam107a | 2.76       |
| NM_001142642   | fibronil-like 1, transcript variant 1          | Fbrs1I | 2.76        |
| NM_001199631   | FK506 binding protein 8, transcript variant 3  | Fkbp8  | 2.75        |
| NM_172756      | ankyrin repeat and LEM domain containing 1     | Ankle1 | 2.75        |
| NM_133859      | olfactomedin-like 3                           | Olfln3 | 2.72        |
| NM_001025576   | coiled-coil domain containing 141             | Ccdc141 | 2.71       |
| NM_025620      | RAB15 effector protein                        | Rep15  | 2.70        |
| NM_010807      | MARCKS-like 1                                 | Marck1I | 2.63       |
| NM_001081406   | leucine rich repeat protein 1                 | Lrlr1  | 2.51        |
| NM_018884      | PDZ domain containing RING finger 3           | Pdzm3  | 2.50        |
| NM_183170      | MPV17 mitochondrial membrane protein-like 2   | Mpv17d2 | 2.44        |
| NM_172116      | Parkinson disease 7 domain containing 1        | Pdcd1  | 2.42        |
| NM_133719      | meteorin, glial cell differentiation regulator | Metrn  | 2.41        |
| NM_030694      | interferon induced transmembrane protein 2    | Ifitm2  | 2.38        |
| NM_145361      | BTB (POZ) domain containing 2                 | Btd2d  | 2.37        |
| NM_009185      | Sc1/Tal1 interrupting locus                   | Stil   | 2.37        |
| NM_016737      | stress-induced phosphoprotein 1               | Stip1  | 2.35        |
| NM_001163721   | small integral membrane protein 1, transcript variant 1 | Smim1 | 2.35        |
| NM_032543      | ring finger protein 123                       | Rnf123 | 2.35        |
| Gene ID       | Description                                                                 | Fold change |
|--------------|------------------------------------------------------------------------------|-------------|
| NM_018771    | GIPC PDZ domain containing family, member 1                                   | 2.34        |
| NM_025378    | interferon induced transmembrane protein 3                                   | 2.32        |
| NM_029377    | lin-37 homolog                                                                | 2.30        |
| NM_001199337 | apolipoprotein O, transcript variant 2                                         | 2.29        |
| NM_133831    | glioma tumor suppressor candidate region gene 2                               | 2.27        |
| NM_010219    | FK506 binding protein 4                                                        | 2.27        |
| NM_138682    | leucine rich repeat containing 4                                              | 2.26        |
| NM_026457    | spermatid associated, transcript variant 2                                     | 2.25        |
| NM_013515    | stomatin                                                                     | 2.24        |
| NM_053113    | eosinophil-associated, ribonuclease A family, member 11                       | 2.21        |
| NM_177028    | O-acetyltransferase like                                                      | 2.18        |
| NM_011627    | trophoblast glycoprotein, transcript variant 1                                | 2.17        |
| NM_146244    | ribosomal protein S6 kinase-like 1                                             | 2.16        |
| NM_133187    | family with sequence similarity 198, member B                                 | 2.14        |
| NM_001025610 | membrane-spanning 4-domains, subfamily A, member 7, transcript variant 2     | 2.13        |
| NM_172488    | laccase (multicopper oxidoreductase) domain containing 1                      | 2.13        |
| NM_175118    | dual specificity phosphatase 28                                               | 2.12        |
| NM_080595    | EMI domain containing 1                                                       | 2.11        |
| NM_144556    | leucine-rich repeat LGI family, member 4                                       | 2.11        |
| NM_019661    | YKT6 homolog                                                                 | 2.10        |
| NM_021294    | diazepam binding inhibitor-like 5                                              | 2.09        |
| NM_016663    | synaptotagmin III, transcript variant 1                                        | 2.08        |
| NM_178919    | lipase maturation factor 2                                                    | 2.08        |
| _NM_011073   | perforin 1 (pore forming protein)                                             | 2.07        |
|             | transportin 2 (importin 3, karyopherin beta 2b), transcript variant 1         |             |
| NM_145390    | Tnpo2                                                                        | 2.07        |
| NM_009538    | pleiomorphic adenoma gene-like 1                                              | 2.05        |
| NM_026938    | transmembrane protein 160                                                     | 2.05        |
| NM_010129    | epithelial membrane protein 3, transcript variant 1                          | 2.04        |
| NM_010590    | ajuba LIM protein                                                             | 2.03        |
| NM_146156    | PDLIM1 interacting kinase 1 like, transcript variant 1                        | 2.03        |
| _NM_001195088| transmembrane channel-like gene family 8, transcript variant 1               |             |
| NM_183194    | gasdermin C3                                                                 | 2.01        |
| NM_027984    | epsin 3                                                                      | 2.00        |

### Protein folding

HSPA (heat shock 70kDa) binding protein, cytoplasmic cochaperone 1
Hspbp1 2.47

Hsp70 heat shock protein 12A
Hspa12a 2.03

### Proteolysis

RAB27A, member RAS oncogene family
Rab27a 5.79

serine (or cysteine) peptidase inhibitor, clade B (ovalbumin),
member 3A
Serpinb3a 5.55

serine (or cysteine) peptidase inhibitor, clade B, member 3C
Serpinb3c 4.67

CD300 antigen like family member F, transcript variant 1
Cd300lf 4.17

ubiquitin-conjugating enzyme E2M, transcript variant 1
Ube2m 3.50

sclerostin domain containing 1*
Sostdc1 4.30

stefin A3
Stfa3 2.99

stefin A2 like 1
Stfa2l1 2.98

Josephin domain containing 2, transcript variant 1
Josd2 2.94

membrane-associated ring finger (C3HC4) 1, transcript variant 3
March1 2.93

mannan-binding lectin serine peptidase 2, transcript variant 2
Masp2 2.91

proteasome (prosome, macropain) subunit, beta type 7
Psmb7 2.80
| Gene Accession | Gene Name & Description | Fold Change |
|----------------|--------------------------|-------------|
| NM_145420 | ubiquitin-conjugating enzyme E2D 1 (Ube2d1) | 2.74 |
| NM_008604 | membrane metallo endopeptidase (Mme) | 2.65 |
| NM_178738 | protease, serine, 35 (Prss35) | 2.60 |
| NM_007649 | CD48 antigen (Cd48) | 2.58 |
| NM_019461 | ubiquitin specific peptidase 27, X chromosome member 3B (Usp27x) | 2.53 |
| NM_198680 | membrane metalloendopeptidase (Mme) | 2.65 |
| NM_010612 | kinase insert domain protein receptor (Kdr) | 2.49 |
| NM_010418 | SMC3 suppressor of mif two 3 homolog 2 (Sumo2) | 2.26 |
| NM_001001650 | protease, serine, 48 (Prss48) | 2.20 |
| NM_011595 | tissue inhibitor of metalloproteinase 3 (Timp3) | 2.21 |
| NM_012011 | eukaryotic translation initiation factor 2, subunit 3, structural gene Y-linked (Eif2s3y) | 6.25 |
| NM_012008 | DEAD (Asp-Glu-Ala-Asp) box polypeptide 25 (Ddx25) | 12.54 |
| NM_173754 | mitochondrial ribosomal protein L37 (Mrpl37) | 2.94 |
| NM_018799 | eukaryotic translation initiation factor 3, subunit I (Eif3i) | 2.70 |
| NM_001008422 | SR-related CTD-associated factor 1 (Scaf1) | 2.54 |
| NM_011431 | elongation factor Tu GTP binding domain containing 2, transcript variant 1 (Eftud2) | 2.42 |
| NM_001166589 | eukaryotic translation initiation factor 5A, transcript variant 1 (Eif5a) | 2.41 |
| NM_175001 | mitochondrial ribosomal protein L22 (Mrpl22) | 2.35 |
| NM_026080 | mitochondrial ribosomal protein S24 (Mrps24) | 2.32 |
| NM_023133 | ribosomal protein S19 (Rps19) | 2.26 |
| NM_016805 | heterogeneous nuclear ribonucleoprotein U (Hnmpu) | 2.24 |
| NM_175235 | CUGBP, Elav-like family member 6 (Celf6) | 2.22 |
| NM_177367 | GEM (nuclear organelle) associated protein 4 (Gemin4) | 2.20 |
| NM_173757 | mitochondrial ribosomal protein S27 (Mrps27) | 2.19 |
| NM_019484 | Aly/REF export factor 2 (Alyref2) | 2.15 |
| NM_148917 | poly(A) binding protein, cytoplasmic 4, transcript variant 2 (Pabpc4) | 2.14 |
| NM_009070 | ribonucleic acid binding protein S1, transcript variant 1 (Rnps1) | 2.12 |
| NM_207523 | ribosomal protein L23A (Rpl23a) | 2.12 |
| NM_021288 | thymidylate synthase, transcript variant 1 (Tysm) | 2.09 |
| NM_022313 | Era (G-protein)-like 1 (Eral1) | 2.08 |
| NM_013507 | eukaryotic translation initiation factor 4, gamma 2, transcript variant 1 (Eif4g2) | 2.01 |

**RNA processing**

| Gene Accession | Gene Name & Description | Fold Change |
|----------------|--------------------------|-------------|
| NM_013932 | DEAD (Asp-Glu-Ala-Asp) box polypeptide 25 (Ddx25) | 12.54 |
| NM_012011 | eukaryotic translation initiation factor 2, subunit 3, structural gene Y-linked (Eif2s3y) | 6.25 |
| NM_012008 | DEAD (Asp-Glu-Ala-Asp) box polypeptide 3, Y-linked (Ddx3y) | 5.02 |
| NM_153416 | achalasia, adrenocortical insufficiency, alacrimia (Aas) | 3.31 |
| NM_011358 | serine/arginine-rich splicing factor 2 (Srsf2) | 2.99 |
| NM_025500 | mitochondrial ribosomal protein L37 (Mrpl37) | 2.94 |
| NM_018799 | eukaryotic translation initiation factor 3, subunit I (Eif3i) | 2.70 |
| NM_001008422 | SR-related CTD-associated factor 1 (Scaf1) | 2.54 |
| NM_011431 | elongation factor Tu GTP binding domain containing 2, transcript variant 1 (Eftud2) | 2.42 |
| NM_001166589 | eukaryotic translation initiation factor 5A, transcript variant 1 (Eif5a) | 2.41 |
| NM_175001 | mitochondrial ribosomal protein L22 (Mrpl22) | 2.35 |
| NM_026080 | mitochondrial ribosomal protein S24 (Mrps24) | 2.32 |
| NM_023133 | ribosomal protein S19 (Rps19) | 2.26 |
| NM_016805 | heterogeneous nuclear ribonucleoprotein U (Hnmpu) | 2.24 |
| NM_175235 | CUGBP, Elav-like family member 6 (Celf6) | 2.22 |
| NM_177367 | GEM (nuclear organelle) associated protein 4 (Gemin4) | 2.20 |
| NM_173757 | mitochondrial ribosomal protein S27 (Mrps27) | 2.19 |
| NM_019484 | Aly/REF export factor 2 (Alyref2) | 2.15 |
| NM_148917 | poly(A) binding protein, cytoplasmic 4, transcript variant 2 (Pabpc4) | 2.14 |
| NM_009070 | ribonucleic acid binding protein S1, transcript variant 1 (Rnps1) | 2.12 |
| NM_207523 | ribosomal protein L23A (Rpl23a) | 2.12 |
| NM_021288 | thymidylate synthase, transcript variant 1 (Tysm) | 2.09 |
| NM_022313 | Era (G-protein)-like 1 (Eral1) | 2.08 |
| NM_013507 | eukaryotic translation initiation factor 4, gamma 2, transcript variant 1 (Eif4g2) | 2.01 |

**Signalling**

| Gene Accession | Gene Name & Description | Fold Change |
|----------------|--------------------------|-------------|
| NM_010100 | ectodysplasin-A receptor* (Edar) | 58.69 |
| NM_009170 | sonic hedgehog* (Shh) | 45.41 |
| NM_176996 | smoothened homolog (Drosophila) (Smo) (Smo) | 36.25 |
| NM_008958 | patched homolog 2 (Ptc2) | 25.72 |
| NM_133249 | peroxisome proliferative activated receptor, gamma, (Ppargc1b) | 16.21 |
| Gene Name | Description | Symbol | Log2 Fold Change |
|-----------|-------------|--------|-----------------|
| coactivator 1 beta | | | |
| ENSMUST00000029611 | lymphoid enhancer binding factor 1 | Lef1 | 9.68 |
| NM_001033960 | RAB GTPase activating protein 1, transcript variant 2 | Rabgap1 | 8.53 |
| NM_007416 | adrenergic receptor, alpha 1b | Adra1b | 6.07 |
| NM_001042605 | CD74 antigen, transcript variant 1 | Cd74 | 5.86 |
| NM_199022 | SHC (Src homology 2 domain containing) family, member 4 | Shc4 | 4.08 |
| NM_026864 | RAS-like, family 11, member A | Ras11a | 3.99 |
| NM_001272024 | sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaforin) 6C , transcript variant 1 | Sema6c | 3.85 |
| NM_009835 | chemokine (C-C motif) receptor 6, transcript variant 1 | Ccr6 | 3.73 |
| NM_146862 | olfactory receptor 763 | Olfr763 | 3.59 |
| NM_001081105 | ras homolog gene family, member H | Rhoh | 3.57 |
| NM_022324 | stromal cell-derived factor 2-like 1 | Sdf2l1 | 3.57 |
| NM_008973 | pleiotrophin | Ptn | 3.52 |
| NM_011562 | teratocarcinoma-derived growth factor 1 | Tdgf1 | 3.47 |
| NM_027242 | protein phosphatase 1, regulatory subunit 35 | Ppp1r35 | 3.44 |
| NM_013834 | secreted frizzled-related protein 1 | Sfrp1 | 3.36 |
| NM_146457 | olfactory receptor 282 | Olfr282 | 3.04 |
| NM_011428 | synaptosomal-associated protein 25 | Snap25 | 2.85 |
| NM_028808 | purinergic receptor P2Y, G-protein coupled 13 | P2ry13 | 2.84 |
| NM_021885 | tubby candidate gene | Tub | 2.75 |
| NM_007889 | dishevelled 3, dsh homolog | Dvl3 | 2.71 |
| NM_010275 | glial cell line derived neurotrophic factor | Gdnf | 2.68 |
| NM_008975 | protein tyrosine phosphatase 4a3, transcript variant 2 | Ptp4a3 | 2.64 |
| NM_008086 | growth arrest specific 1 | Gas1 | 2.61 |
| NM_029408 | IQ motif containing D | Iqcd | 2.61 |
| NM_183315 | cortexin 1 | Ctxn1 | 2.6 |
| NM_207666 | delta-like 2 homolog | Dlk2 | 2.6 |
| NM_010733 | leucine rich repeat protein 3, neuronal, transcript variant 2 | Lmr3 | 2.58 |
| NM_029057 | TBC1 domain family, member 30 | Tbc1d30 | 2.58 |
| NM_177740 | RGM domain family, member A | Rgma | 2.58 |
| NM_013739 | docking protein 3 | Dok3 | 2.54 |
| NM_010517 | insulin-like growth factor binding protein 4 | Igfbp4 | 2.52 |
| NM_007479 | ADP-ribosylation factor 4 | Arf4 | 2.51 |
| NM_009708 | Rho family GTPase 2 | Rnd2 | 2.48 |
| NM_008342 | insulin-like growth factor binding protein 2 | Igfbp2 | 2.48 |
| NM_022657 | fibroblast growth factor 23 | Fgf23 | 2.46 |
| NM_028804 | coiled-coil domain containing 3 | Ccdc3 | 2.44 |
| NM_026814 | protein phosphatase 1, regulatory subunit 27 | Ppp1r27 | 2.43 |
| NM_198249 | Rho guanine nucleotide exchange factor (GEF) 40 , transcript variant 1 | Arhgef40 | 2.43 |
| NM_008356 | interleukin 13 receptor, alpha 2 | Il13ra2 | 2.41 |
| NM_011823 | G protein-coupled receptor 34 | Gpr34 | 2.41 |
| NM_010572 | insulin receptor substrate 4 | Irs4 | 2.38 |
| NM_145431 | notchless homolog 1 | Nle1 | 2.38 |
| NM_145373 | secreted and transmembrane 1A | Sectm1a | 2.37 |
| NM_027280 | naked cuticle 1 homolog, transcript variant 1 | Nkd1 | 2.37 |
| NM_026840 | platelet-derived growth factor receptor-like | Pdgfrl | 2.34 |
| NM_007955 | protein tyrosine phosphatase, receptor type, V | Ptprv | 2.31 |
| NM_009750 | nerve growth factor receptor (TNFRSF16) associated protein 1, transcript variant 1 | Ngfrap1 | 2.26 |
| NM_145379 | MAS-related GPR, member F | Mrgprf | 2.26 |
| NM_016719 | growth factor receptor bound protein 14 | Grb14 | 2.25 |
| NM_016802 | ras homolog gene family, member A | Rhoa | 2.25 |
| NM_001033484 | IQ motif containing GTPase activating protein 3 | Iqgap3 | 2.25 |
| Accession | Gene Symbol | Gene Name | log2 Fold Change |
|-----------|-------------|-----------|-----------------|
| NM_009109 | Ryr1        | Ryanodine receptor 1, skeletal muscle | 2.22 |
| NM_008865 | Prl3b1      | Prolactin family 3, subfamily b, member 1 | 2.22 |
| NM_146216 | Vac14       | Vac14 homolog | 2.22 |
| NM_009314 | Tacr2       | Tachykinin receptor 2 | 2.21 |
| NM_016891 | Ppp2r1a     | Protein phosphatase 2 (formerly 2A), regulatory subunit A (PR 65), alpha isoform | 2.21 |
| NM_008865 | Prl3b1      | Prolactin family 3, subfamily b, member 1 | 2.22 |
| NM_009216 | Sstr1       | Somatostatin receptor 1 | 2.18 |
| NM_016891 | Ppp2r1a     | Protein phosphatase 2 (formerly 2A), regulatory subunit A (PR 65), alpha isoform | 2.21 |
| NM_008865 | Prl3b1      | Prolactin family 3, subfamily b, member 1 | 2.22 |
| NM_147030 | Olfr521     | Olfactory receptor 521 | 2.11 |
| NM_138748 | Postn       | Periostin, osteoblast specific factor, transcript variant 3 | 2.02 |
| NM_206975 | Ifna14      | Interferon, alpha 14 | 2.08 |
| NM_023209 | Pbk         | PDZ binding kinase | 2.06 |
| NM_008728 | Npr3        | Natriuretic peptide receptor 3 | 2.04 |
| NM_007865 | Dll1        | Delta-like 1 | 2.04 |
| NM_011915 | Snx3        | Sorting nexin 3 | 2.03 |
| NM_001011850 | Gdi1     | Guanosine diphosphate (GDP) dissociation inhibitor 1 | 2.11 |
| NM_008113 | Arhgdig     | Rho GDP dissociation inhibitor (GDI) gamma | 2.01 |
| NM_010273 | Olfr134     | Olfactory receptor 134 | 2.14 |
| NM_011915 | Snx3        | Sorting nexin 3 | 2.03 |
| NM_001033851 | Cpne8    | Copine VIII, transcript variant 2 | 2.0 |
| NM_001038018 | Grk6      | G protein-coupled receptor kinase 6, transcript variant 1 | 2.01 |
| NM_001033851 | Ctnnb1   | Hedgehog-interacting protein | 2.01 |
| NM_001038018 | Grk6      | G protein-coupled receptor kinase 6, transcript variant 1 | 2.01 |
| NM_001164724 | Ili33     | Interleukin 33, transcript variant 1 | 2.0 |
| NM_00110320 | Cd72       | CD72 antigen, transcript variant 1 | 1.99 |
| NM_027571 | P2ry12      | Purinergic receptor P2Y, G-protein coupled 12 | 1.99 |
| NM_001165902 | Ctnnb1   | Catenin* | 1.4 |
| **Transcription** | | | |
| NM_172495 | Ncoa7       | Nuclear receptor coactivator 7, transcript variant 1 | 11.61 |
| NM_027395 | Basp1       | Brain abundant, membrane attached signal protein 1 | 4.75 |
| NM_011640 | Trp53       | Transformation related protein 53, transcript variant 1 | 3.77 |
| | | V-myc myelocytomatosis viral related oncogene, | |
| NM_008709 | Mecn       | Neuroblastoma derived | 3.65 |
| NM_008688 | Nfic        | Nuclear factor I/C, transcript variant 1 | 3.56 |
| NM_009236 | Sox18       | SRY-box containing gene 18 | 3.55 |
| NM_181319 | Tbx22       | T-box containing gene 18 | 3.54 |
| NM_016662 | Mxd3        | Max dimerization protein 3 | 3.37 |
| NM_010055 | Dlx3        | Distal-less homeobox 3 | 3.30 |
| | | Nucleus accumbens associated 1, BEN and BTB (POZ) | |
| NM_025788 | Nacc1       | Domain containing | 3.02 |
| NM_028016 | Nanog       | Nanog homeobox | 2.94 |
| NM_010466 | Hoxc8       | Homeobox C8 | 2.87 |
| NM_009089 | Polr2a      | Polynucleotide polymerase (RNA) II (DNA directed) polypeptide A | 2.81 |
| NM_009331 | Tcf7        | Transcription factor 7, T cell specific | 2.76 |
| NM_170759 | Zfp628      | Zinc finger protein 628 (Zfp628) | 2.73 |
| NM_178757 | Irf2bp1     | Interferon regulatory factor 2 binding protein 1 | 2.68 |
| NM_026776 | Vps25       | Vacuolar protein sorting 25 | 2.65 |
| Gene Accession | Gene Name                                          | Fold Change |
|----------------|----------------------------------------------------|-------------|
| NM_026532      | nuclear transport factor 2                         | Nutf2       | 2.64        |
| NM_009235      | SRY-box containing gene 15                         | Sox15       | 2.62        |
| NM_146040      | cell division cycle associated 7 like              | Cdc47       | 2.62        |
| NM_008505      | LIM domain only 2, transcript variant 1            | Lmo2        | 2.58        |
| NM_001037914   | multilicate cell differentiation                    | Mcin        | 2.50        |
| NM_026192      | calcium binding and coiled coil domain 1           | Calcoco1    | 2.49        |
| NM_011642      | transformation related protein 73, transcript variant 1 | Trp73   | 2.46        |
| NM_001001980   | LIM and calponin homology domains 1, transcript variant 1 | Limch1   | 2.39        |
| NM_010919      | NK2 transcription factor related, locus 2, transcript variant 1 | Nkx2-2     | 2.37        |
| NM_178609      | E2F transcription factor 7                          | E2f7        | 2.37        |
| NM_007946      | DDB1 and CUL4 associated factor 7                   | Dcaf7       | 2.36        |
| NM_001033813   | zinc finger protein 872                            | Zfp872      | 2.35        |
| NM_011139      | POU domain, class 2, transcription factor 3         | Pou2f3      | 2.34        |
| NM_011869      | mediator complex subunit 24                        | Med24       | 2.33        |
| NM_010835      | homeobox, msh-like 1                               | Msx1        | 2.32        |
| NM_008269      | activating signal cointegrator 1 complex subunit 1 , transcript variant 2 | Ascc1 | 2.23        |
| NM_026937      | POZ (BTB) and AT hook containing zinc finger 1, transcript variant 1 | Patz1 | 2.22        |
| NM_019574      | SKI family transcriptional corepressor 2           | Skor2       | 2.22        |
| NM_001109743   | protein inhibitor of activated STAT 4               | Pias4       | 2.22        |
| NM_001163763   | transcription factor 19, transcript variant 1       | Tcf19       | 2.21        |
| NM_007658      | hexamethylene bis-acetamide inducible 2 , transcript variant 1 | Hexim2 | 2.17        |
| NM_001034900   | zinc finger protein 345                            | Zfp345      | 2.15        |
| NM_019776      | staphylococcal nuclease and tudor domain containing 1 | Snd1   | 2.12        |
| NM_029281      | zinc finger protein 820                            | Zfp820      | 2.11        |
| NM_008627      | Meis homeobox 3                                    | Meis3       | 2.09        |
| NM_001168502   | zinc finger protein 57, transcript variant 3        | Zfp57       | 2.08        |
| NM_194350      | v-maf musculoaponeurotic fibrosarcoma oncogene family, protein A | Mafa | 2.06        |
| NM_145836      | interferon regulatory factor 2 binding protein-like | Irf2bpl     | 2.06        |
| NM_011249      | retinoblastoma-like 1 (p107), transcript variant 1  | Rbl1        | 2.06        |
| NM_011377      | single-minded homolog 2                            | Sim2        | 2.04        |
| NM_025945      | polymerase (RNA) III (DNA directed) polypeptide D, transcript variant 1 | Polr3d | 2.04        |
| NM_027434      | regulation of nuclear pre-mRNA domain containing 1B | Rprd1b      | 2.04        |
| NM_008321      | inhibitor of DNA binding 3                         | Id3         | 2.02        |
| NM_010464      | homeobox C13                                        | Hoxc13      | 2.02        |
| NM_009056      | regulatory factor X, 2 (influences HLA class II expression), transcript variant 2 | Rfx2   | 2.01        |
| NM_001013368   | E2F transcription factor 8                          | E2f8        | 2.01        |
| NM_144799      | LIM and cysteine-rich domains 1                     | Lmcd1       | 2.00        |
| NM_002435      | trans-acting transcription factor 5                 | Sp5         | 2.00        |
| NM_008500      | LIM homeobox protein 6, transcript variant 1        | Lhx6        | 1.99        |
| NM_007531      | prohibitin 2                                         | Phb2        | 1.99        |

**Transport**

| Gene Accession | Gene Name                                          | Fold Change |
|----------------|----------------------------------------------------|-------------|
| NM_012037      | vesicle amine transport protein 1 homolog          | Vat1        | 2.04        |
| NM_001164679   | anoctamin 8                                         | Ano8        | 2.23        |
| NM_008226      | hyperpolarization-activated, cyclic nucleotide-gated K+ 2 | Hcn2   | 3.05        |

*genes validated by qPCR*
Table S2. Genes that show 2-fold up-regulation in the epithelium of K14rtTA/TRE-miR-214 mice versus WT mice

| Accession Number | Gene Name | Symbol | Fold Change |
|------------------|-----------|--------|-------------|
| **Adhesion/Extracellular matrix** | | | |
| NM_018857 | mesothelin | Msln | 43.81 |
| NM_009856 | CD83 antigen | Cd83 | 3.46 |
| NM_139200 | cytohesin 1 interacting protein | Cytip | 3.39 |
| NM_027852 | retinoic acid receptor responder (tazarotene induced) 2 | Rarres2 | 3.08 |
| NM_001243008 | collagen, type VI, alpha 3, transcript variant 1 | Col6a3 | 2.98 |
| NM_009903 | claudin 4 | Cldn4 | 2.96 |
| NM_009903 | claudin 4 | Cldn4 | 2.96 |
| NM_138672 | stabilin 1 | Stab1 | 2.3 |
| NM_145158 | elastin microfibril interfacer 2 | Emilin2 | 2.25 |
| NM_001093749 | myelin protein zero-like 3, transcript variant 2 | Mpzl3 | 2.19 |
| NM_027893 | poliovirus receptor-related 4 , transcript variant 1 | Pvr4 | 2.19 |
| NM_033620 | par-3 (partitioning defective 3) homolog, transcript variant 3 | Pard3 | 2.18 |
| NM_016919 | collagen, type V, alpha 3 | Col5a3 | 2.17 |
| NM_010814 | myelin oligodendrocyte glycoprotein | Mog | 2.17 |
| NM_010291 | gap junction protein, beta 4 | Gjb4 | 2.16 |
| NM_010291 | gap junction protein, beta 5 | Gjb5 | 2.16 |
| NM_001016 | orosomucoid 2 | Orm2 | 2.16 |
| NM_001111058 | CD33 antigen, transcript variant 1 | Cdoll2 | 2.15 |
| NM_080437 | cadherin, EGF LAG seven-pass G-type receptor 3 (flamingo homolog, Drosophila) | Celsr3 | 2.13 |
| NM_133743 | Ly6/Plaur domain containing 3 | Lypd3 | 2.13 |
| NM_001113368 | carcinoembryonic antigen-related cell adhesion molecule 2, transcript variant 1 | Ceacam2 | 2.1 |
| NM_008768 | orosomucoid 1 | Orm1 | 2.09 |
| NM_028523 | discoidin, CUB and LCCL domain containing 2 | Dcbld2 | 2.08 |
| NM_007993 | collagen, type IV, alpha 3 binding protein, transcript variant 1 | Col4a3bp | 2.05 |
| NM_01081053 | integrin, alpha 10 | Itga10 | 2 |
| **Cell Cycle/Apoptosis** | | | |
| tumor necrosis factor, alpha-induced protein 3, transcript variant 1 | Tnfaip3 | 5.11 |
| B cell translocation gene 2, anti-proliferative | Btg2 | 4.69 |
| titin-cap | Tcap | 4.31 |
| dual specificity phosphatase 1 | Dusp1 | 3.28 |
| death effector domain-containing DNA binding protein 2 | Dedd2 | 2.96 |
| cyclin-dependent kinase 5, regulatory subunit 1 (p35) | Cdk5r1 | 2.63 |
| sestrin 1, transcript variant 1 | Sesn1 | 2.61 |
| TMF1-regulated nuclear protein 1 | Trmp1 | 2.61 |
| caspase recruitment domain family, member 14 | Card14 | 2.59 |
| BCL2 adenovirus E1B interacting protein 3 | Bnip3 | 2.46 |
| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_007609        | caspase 4, apoptosis-related cysteine peptidase        | 2.42            |
| NM_008681        | N-myc downstream regulated gene 1                     | 2.32            |
| NM_013469        | annexin A11                                           | 2.25            |
| NM_025427        | regulator of cell cycle                               | 2.17            |
| NM_001103182     | lin-9 homolog, transcript variant 1                   | 2.14            |
| NM_144899        | ADAMTS-like 4                                         | 2.13            |
| NM_001003920     | BR serine/threonine kinase 1, transcript variant 1    | 2.13            |
| NM_008795        | cyclin-dependent kinase 18                            | 2.13            |

**Chromatin remodeling**

| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_001097979     | histone cluster 1, H2bq                                | 59.61           |
| NM_178909        | WD repeat domain 92                                   | 9.88            |
| NM_178196        | histone cluster 1, H2bg                                | 5.99            |
| NM_015786        | histone cluster 1, H1c                                 | 4.74            |
| NM_023422        | histone cluster 1, H2bc                                | 4.26            |
| BC015270         | histone cluster 2, H3c2                                | 3.7             |
| BC059807         | PHD finger protein 21A, transcript variant 3           | 2.34            |
| NM_001128151     | cat eye syndrome chromosome region, candidate 2        | 2.33            |
| NM_001081269     | polyhomeotic-like 3 (Drosophila), transcript variant 2 | 2.24            |
| NM_010434        | polyhomeotic-like 3 (Drosophila), transcript variant 2 | 2.22            |
| NM_027892        | protein phosphatase 1, regulatory (inhibitor) subunit 12A | 2.19           |
| NM_026110        | PAX3 and PAX7 binding protein 1                        | 2.14            |
| NM_001017426     | KDM1 lysine (K)-specific demethylase 6B                | 2.04            |
| NM_001177374     | ubiquitin protein ligase E3 component n-recognin 2,   | 2.03            |
| NM_011235        | RAD51 homolog D                                       | 2.02            |

**Cytoskeleton**

| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_008508        | loricrin                                              | 8.18            |
| NM_025420        | late cornified envelope 1M                            | 5.51            |
| NM_027762        | trichohyalin-like 1                                   | 4.5             |
| NM_001099774     | keratin associated protein 17-1                       | 3.85            |
| NM_029667        | late cornified envelope 1I                            | 3.83            |
| NM_212487        | keratin 78                                             | 3.81            |
| NM_027137        | late cornified envelope 1D                            | 3.62            |
| NM_011472        | small proline-rich protein 2F                         | 3.61            |
| NM_001005510     | spectrin repeat containing, nuclear envelope 2        | 3.5             |
| NM_013560        | heat shock protein 1                                  | 3.49            |
| NM_026394        | late cornified envelope 1F                            | 3.49            |
| NM_011470        | small proline-rich protein 2D                         | 3.49            |
| NM_033373        | keratin 23                                            | 3.38            |
| NM_011471        | small proline-rich protein 2E                         | 3.23            |
| NM_011619        | troponin T2, cardiac, transcript variant 9            | 3.19            |
| NM_010664        | keratin 18                                            | 3.14            |
| NM_001252372     | myosin binding protein C, slow-type, transcript variant 1 | 3.14        |

**Cytoskeleton**

| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_007609        | caspase 4, apoptosis-related cysteine peptidase        | 2.42            |
| NM_008681        | N-myc downstream regulated gene 1                     | 2.32            |
| NM_013469        | annexin A11                                           | 2.25            |
| NM_025427        | regulator of cell cycle                               | 2.17            |
| NM_001103182     | lin-9 homolog, transcript variant 1                   | 2.14            |
| NM_144899        | ADAMTS-like 4                                         | 2.13            |
| NM_001003920     | BR serine/threonine kinase 1, transcript variant 1    | 2.13            |
| NM_008795        | cyclin-dependent kinase 18                            | 2.13            |

**Chromatin remodeling**

| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_001097979     | histone cluster 1, H2bq                                | 59.61           |
| NM_178909        | WD repeat domain 92                                   | 9.88            |
| NM_178196        | histone cluster 1, H2bg                                | 5.99            |
| NM_015786        | histone cluster 1, H1c                                 | 4.74            |
| NM_023422        | histone cluster 1, H2bc                                | 4.26            |
| BC015270         | histone cluster 2, H3c2                                | 3.7             |
| BC059807         | PHD finger protein 21A, transcript variant 3           | 2.34            |
| NM_001128151     | cat eye syndrome chromosome region, candidate 2        | 2.33            |
| NM_001081269     | polyhomeotic-like 3 (Drosophila), transcript variant 2 | 2.24            |
| NM_010434        | polyhomeotic-like 3 (Drosophila), transcript variant 2 | 2.22            |
| NM_027892        | protein phosphatase 1, regulatory (inhibitor) subunit 12A | 2.19           |
| NM_026110        | PAX3 and PAX7 binding protein 1                        | 2.14            |
| NM_001017426     | KDM1 lysine (K)-specific demethylase 6B                | 2.04            |
| NM_001177374     | ubiquitin protein ligase E3 component n-recognin 2,   | 2.03            |
| NM_011235        | RAD51 homolog D                                       | 2.02            |

**Cytoskeleton**

| Gene ID          | Description                                           | Log2 Fold Change |
|------------------|-------------------------------------------------------|-----------------|
| NM_008508        | loricrin                                              | 8.18            |
| NM_025420        | late cornified envelope 1M                            | 5.51            |
| NM_027762        | trichohyalin-like 1                                   | 4.5             |
| NM_001099774     | keratin associated protein 17-1                       | 3.85            |
| NM_029667        | late cornified envelope 1I                            | 3.83            |
| NM_212487        | keratin 78                                             | 3.81            |
| NM_027137        | late cornified envelope 1D                            | 3.62            |
| NM_011472        | small proline-rich protein 2F                         | 3.61            |
| NM_001005510     | spectrin repeat containing, nuclear envelope 2        | 3.5             |
| NM_013560        | heat shock protein 1                                  | 3.49            |
| NM_026394        | late cornified envelope 1F                            | 3.49            |
| NM_011470        | small proline-rich protein 2D                         | 3.49            |
| NM_033373        | keratin 23                                            | 3.38            |
| NM_011471        | small proline-rich protein 2E                         | 3.23            |
| NM_011619        | troponin T2, cardiac, transcript variant 9            | 3.19            |
| NM_010664        | keratin 18                                            | 3.14            |
| NM_001252372     | myosin binding protein C, slow-type, transcript variant 1 | 3.14        |
| Accession Number | Description                                                                 | Symbol | Fold Change |
|------------------|------------------------------------------------------------------------------|--------|-------------|
| NM_008473        | keratin 1                                                                     | Krt1   | 3.06        |
| NM_028622        | late cornified envelope 1C (Lce1c)                                           | Lce1c  | 2.97        |
| NM_001039376     | transcript variant 1                                                          | Pde4dip| 2.88        |
| NM_026822        | late cornified envelope 1B                                                   | Lce1b  | 2.84        |
| NM_001271484     | CAP-GLY domain containing linker protein family, member 4, transcript variant 4 | Clip4  | 2.79        |
| NM_028044        | calponin 3, acidic                                                            | Cnn3   | 2.75        |
| NM_007585        | annexin A2                                                                   | Anxa2  | 2.74        |
| NM_033175        | late cornified envelope 3C                                                   | Lce3c  | 2.72        |
| NM_025501        | late cornified envelope 3B                                                   | Lce3b  | 2.64        |
| NM_001018079     | late cornified envelope 3F                                                   | Lce1e  | 2.57        |
| NM_001270426     | late cornified envelope 3D                                                   | Lce3d  | 2.55        |
| NM_001039472     | kinesin family member 21B                                                   | Kif21b | 2.4         |
| NM_018790        | activity regulated cytoskeletal-associated protein                           | Arc    | 2.38        |
| NM_028721        | nephronophthisis 3 (adolescent), transcript variant 1                         | Nphp3  | 2.38        |
| NM_025413        | late cornified envelope 1G                                                   | Lce1g  | 2.33        |
| NM_030203        | TSPY-like 4                                                                   | Tspy4  | 2.33        |
| NM_145070        | huntingtin interacting protein 1 related                                     | Hip1r  | 2.26        |
| NM_010630        | kinesin family member C2                                                     | Kifc2  | 2.24        |
| NM_025984        | late cornified envelope 1A1                                                  | Lce1a1 | 2.24        |
| NM_019765        | CAP-GLY domain containing linker protein 1                                   | Clip1  | 2.19        |
| NM_001039594     | late cornified envelope 3A                                                   | Lce3a  | 2.18        |
| NM_146120        | gelsolin, transcript variant 1                                               | Gsn    | 2.17        |
| NM_001109657     | growth arrest specific 7, transcript variant 2                               | Gas7   | 2.14        |
| NM_133357        | keratin 75                                                                   | Krt75  | 2.11        |
| NM_001254760     | late cornified envelope 1K                                                   | Lce1k  | 2.11        |
| NM_019809        | PDZ and LIM domain 5, transcript variant 2                                   | Pdlim5 | 2.08        |
| NM_009450        | tubulin, beta 2A class IIa                                                   | Tubb2a | 2.07        |
| NM_010660        | keratin 10                                                                   | Krt10  | 2.06        |
| NM_175180        | WD repeat domain 44                                                          | Wdr44  | 2.06        |
| NM_178593        | RCSD domain containing 1, transcript variant 1                               | Rcsd1  | 2.04        |
| NM_198113        | slingshot homolog 3                                                          | Ssh3   | 2.03        |
| NM_001163664     | troponin T3, skeletal, fast , transcript variant 1                           | Tnnt3  | 2.01        |

**Metabolism**

| Accession Number | Description                                                                 | Symbol | Fold Change |
|------------------|------------------------------------------------------------------------------|--------|-------------|
| NM_013743        | pyruvate dehydrogenase kinase, isoenzyme 4, nuclear gene encoding mitochondrial protein | Pdk4   | 5.79        |
| NM_175650        | ATPase type 13A5                                                             | Atp13a5| 5.26        |
| NM_027299        | degenerative spermatocyte homolog 2 (Drosophila), lipid desaturase, transcript variant 1 | Dgs2  | 5.02        |
| NM_011435        | superoxide dismutase 3, extracellular                                      | Sod3   | 4.95        |
| NM_146118        | solute carrier family 25 (mitochondrial carrier, phosphate carrier), member 25, transcript variant 1 | Slc25a25| 4.52        |
| NM_00111331      | Kv channel interacting protein 3, calnexilin , transcript variant 2         | Kcnip3 | 4.38        |
| NM_001199283     | solute carrier family 43, member 2, transcript variant 1                    | Sloc3a2| 4.33        |
| NM_007409        | alcohol dehydrogenase 1 (class I)                                           | Adh1   | 4.23        |
| NM_001164613     | ATPase type 13A4, transcript variant 3                                       | Atp13a4| 4.18        |
| NM_001130194     | bestrophin 2, transcript variant 1                                           | Best2  | 4.18        |
| NM_0009593       | ATP-binding cassette, sub-family G (WHITE), member 1                        | Abcg1  | 3.91        |
| NM_026945        | alcohol dehydrogenase 6A (class V)                                          | Adh6a  | 3.68        |
| NM_001177753     | 6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3, transcript variant 2 | Pfkb3  | 3.61        |
| NM_194333        | solute carrier family 23 (nucleobase transporters), member 3                | Slc23a3| 3.52        |
| NM_001098789     | NADH dehydrogenase (ubiquinone) 1 alpha subcomplex,                           | Ndufa4l2| 3.45        |
NM_011031  procollagen-proline, 2-oxoglutarate 4-dioxygenase, alpha II polypeptide, transcript variant 2 P4ha2 3.45
NM_030696  solute carrier family 16 (monocarboxylic acid transporters), member 3 Slc16a3 3.28
NM_001042591 arrestin domain containing 3 Arrdc3 3.27
NM_028784  coagulation factor XIII, A1 subunit, transcript variant 1 F13a1 3.24
NM_028133  EGL nine homolog 3 (C. elegans) Egln3 3.13
NM_183161  solute carrier family 17, member 9 Slc17a9 3.01
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_029415  solute carrier family 10 (sodium/bile acid cotransporter family), member 6 Slc10a6 2.84
NM_001195033 abhydrolase domain containing 12B Abhd12b 2.66
NM_01195033 carboxylesterase 2F Ces2f 2.65
NM_011198  prostaglandin-endoperoxide synthase 2 Ptgs2 2.65
NM_172524  NIPA-like domain containing 4 Nipal4 2.63
NM_172837  lipase, family member K, transcript variant 2 Lipk 2.7
NM_030558  carbonic anhydrase 15 Car15 2.68
NM_153143  potassium channel tetramerisation domain containing 11 Kctd11 2.67
NM_01267707 1a5, transcript variant 1 Slco1a5 2.67
NM_007421  adenylsuccinate synthetase like 1 Adss1 2.74
NM_172883  major facilitator superfamily domain containing 7A Mfsd7a 2.74
NM_007470  apolipoprotein D Apod 2.66
NM_013455  acrosin prepropeptide, transcript variant 1 Acr 2.71
NM_172287  major facilitator superfamily domain containing 8A Mfsd8a 2.71
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_001114084 diacylglycerol O-acyltransferase 2-like 6 Dgat2l6 2.88
NM_029415  solute carrier family 10 (sodium/bile acid cotransporter family), member 6 Slc10a6 2.84
NM_001042591 arrestin domain containing 3 Arrdc3 3.27
NM_028784  coagulation factor XIII, A1 subunit, transcript variant 1 F13a1 3.24
NM_028133  EGL nine homolog 3 (C. elegans) Egln3 3.13
NM_183161  solute carrier family 17, member 9 Slc17a9 3.01
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_001114084 diacylglycerol O-acyltransferase 2-like 6 Dgat2l6 2.88
NM_01267707 1a5, transcript variant 1 Slco1a5 2.67
NM_007421  adenylsuccinate synthetase like 1 Adss1 2.74
NM_172883  major facilitator superfamily domain containing 7A Mfsd7a 2.74
NM_007470  apolipoprotein D Apod 2.66
NM_013455  acrosin prepropeptide, transcript variant 1 Acr 2.71
NM_172287  major facilitator superfamily domain containing 8A Mfsd8a 2.71
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_001114084 diacylglycerol O-acyltransferase 2-like 6 Dgat2l6 2.88
NM_01267707 1a5, transcript variant 1 Slco1a5 2.67
NM_007421  adenylsuccinate synthetase like 1 Adss1 2.74
NM_172883  major facilitator superfamily domain containing 7A Mfsd7a 2.74
NM_007470  apolipoprotein D Apod 2.66
NM_013455  acrosin prepropeptide, transcript variant 1 Acr 2.71
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NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_001114084 diacylglycerol O-acyltransferase 2-like 6 Dgat2l6 2.88
NM_01267707 1a5, transcript variant 1 Slco1a5 2.67
NM_007421  adenylsuccinate synthetase like 1 Adss1 2.74
NM_172883  major facilitator superfamily domain containing 7A Mfsd7a 2.74
NM_007470  apolipoprotein D Apod 2.66
NM_013455  acrosin prepropeptide, transcript variant 1 Acr 2.71
NM_172287  major facilitator superfamily domain containing 8A Mfsd8a 2.71
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
NM_001114084 diacylglycerol O-acyltransferase 2-like 6 Dgat2l6 2.88
NM_01267707 1a5, transcript variant 1 Slco1a5 2.67
NM_007421  adenylsuccinate synthetase like 1 Adss1 2.74
NM_172883  major facilitator superfamily domain containing 7A Mfsd7a 2.74
NM_007470  apolipoprotein D Apod 2.66
NM_013455  acrosin prepropeptide, transcript variant 1 Acr 2.71
NM_172287  major facilitator superfamily domain containing 8A Mfsd8a 2.71
NM_001111111 autophagy related 16-like 2 Atg16l2 2.92
| Gene Symbol | Description                                                                 | Exp. Value |
|-------------|------------------------------------------------------------------------------|------------|
| NM_172692   | glucosidase beta 2, solute carrier family 15 (oligopeptide transporter), member 1 | Gba2       | 2.23 |
| NM_053079   | N-acetylglucosaminyltransferase, alpha-1, transcript variant 1               | Slc15a1    | 2.23 |
| NM_018830   | laminin, beta 2                                                             | Asah2      | 2.22 |
| NM_018881   | flavin containing monooxygenase 2                                            | Fmo2       | 2.22 |
| NM_013509   | enolase 2, gamma neuronal                                                    | Eno2       | 2.21 |
| NM_001163689| patatin-like phospholipase domain containing 2, transcript variant 1         | Pnpla2     | 2.21 |
| NM_026784   | phosphomevalonate kinase, transcript variant 1                               | Pmvk       | 2.18 |
| NM_026644   | (lymphoprotidase, alpha-2,3-sialyltransferase 1)                             | C1galt1     | 2.16 |
| NM_010239   | ferritin heavy chain 1, transcript variant 1                                 | Fth1       | 2.17 |
| NM_008504   | granzyme M (lymphocyte met-ase 1)                                            | Gzmm       | 2.17 |
| NM_145423   | solute carrier family 5 (iodide transporter), member 8                      | Slc5a8     | 2.17 |
| NM_052993   | C1galt1                                                                     |            | 2.16 |
| NM_019779   | cytochrome P450, family 11, subfamily a, polypeptide 1                       | Cyp11a1     | 2.16 |
| NM_175331   | 5'-nucleotidase domain containing 3                                         | Nt5dc3     | 2.16 |
| NM_008131   | glutamate-ammonia ligase (glutamine synthetase)                             | Glul       | 2.15 |
| NM_009177   | ST3 beta-galactoside alpha-2,3-sialyltransferase 1                           | St3gal1     | 2.15 |
| NM_01039710 | coenzyme Q10 homolog B, transcript variant 1                                 | Coq10b     | 2.14 |
| NM_027340   | lipase, family member N                                                      | Lipn       | 2.13 |
| NM_147219   | ATP-binding cassette, sub-family A , member 5                                | Abca5      | 2.09 |
| NM_019807   | acid phosphatase, prostate , transcript variant 2                            | Acpp       | 2.07 |
| NM_172607   | nicotinate phosphoribosyltransferase domain containing 1                     | Naprt1     | 2.07 |
| NM_029810   | 5'-nucleotidase, cytosolic II , transcript variant 3                         | Nt5dc2     | 2.07 |
| NM_027406   | aldehyde dehydrogenase 1 family, member L1                                  | Aldh1l1    | 2.06 |
| NM_153803   | galactosidase, beta 1-like 2                                                | Glb1l2     | 2.06 |
| NM_001159864| potassium channel tetramerisation domain containing 18, transcript variant 1| Kctd18     | 2.05 |
| NM_001161767| UDP-N-acetyl-alpha-D-galactosamine:N-acetylgalactosaminyltransferase 6, transcript variant 1 | Galnt6 | 2.04 |
| NM_145447   | major facilitator superfamily domain containing 7C                          | Mfsd7c     | 2.04 |
| NM_013820   | hexokinase 2                                                                 | Hk2        | 2.03 |
| NM_001161765| flavin containing monooxygenase 5, transcript variant 1                     | Fmo5       | 2.02 |
| NM_025718   | deoxyribonuclease 1-like 2                                                  | Dnase1l2   | 2.02 |
| NM_013850   | ATP-binding cassette, sub-family A, member 7                                 | Abca7      | 2.01 |
| NM_009721   | ATPase, Na+/K+ transporting, beta 1 polypeptide                             | Atp1b1     | 2.01 |

**Others**

| Gene Symbol | Description                                                                 | Exp. Value |
|-------------|------------------------------------------------------------------------------|------------|
| NM_172051   | transmembrane and coiled coil domains 3, transcript variant 1                | Tmcc3      | 7.29 |
| NM_001163502| ELM2 and Myb/SANT-like domain containing 1, transcript variant 1            | Elmsan1    | 6.84 |
| NM_001166173| dermatokin, transcript variant 3                                             | Dmkn       | 5.26 |
| NM_001204959| resistin , transcript variant 2                                              | Retn       | 5.11 |
| NM_175307   | family with sequence similarity 46, member B                                | Fam46b     | 4.69 |
| NM_001199210| eva-1 homolog C (C. elegans) , transcript variant 1                          | Eva1c      | 4.66 |
| NM_197986   | transmembrane protein 140                                                   | Tmem140    | 4     |
| NM_172205   | suprabasin, transcript variant 1                                             | Sbsn       | 3.93 |
| NM_001190436| ubiquitously expressed, transcript variant 3                                | Fau        | 3.74 |
| NM_028798   | cysteine-rich C-terminal 1                                                   | Crct1      | 3.73 |
| NM_001033411| predicted gene 826                                                          | Gm826      | 3.55 |
| BC090258    | interferon induced transmembrane protein 1                                 | Ifitm1     | 3.24 |
| NM_027511   | histidine rich carboxyl terminus 1                                           | Hrct1      | 3.19 |
| NM_013473   | annexin A8                                                                  | Anxa8      | 3.16 |
| NM_009778   | complement component 3                                                      | C3         | 3.16 |
| Accession   | Description                                                                 | Symbol   | Ratio   |
|-------------|------------------------------------------------------------------------------|----------|---------|
| NM_145535   | syndecan binding protein (syntenin) 2                                         | Sdcbp2   | 2.91    |
| NM_027585   | cyclic nucleotide binding domain containing 2                                 | Cnbd2    | 2.88    |
| NM_001013749| transmembrane protein 151B                                                   | Tmem151b | 2.87    |
| NM_172801   | ototphin 2                                                                    | Otop2    | 2.85    |
| NM_001033410| predicted gene 757                                                           | Gm757    | 2.79    |
| NM_181397   | raftlin lipid raft linker 1                                                   | Rftn1    | 2.78    |
| NM_001163572| transmembrane protein 170B                                                    | Tmem170b | 2.73    |
| NM_001025572| ankyrin repeat domain 12                                                     | Ankrd12  | 2.58    |
| NM_010220   | FK506 binding protein 5                                                        | Fkbp5    | 2.57    |
| NM_173415   | nyctalopin                                                                    | Nyx      | 2.57    |
| NM_175407   | sine oculis-binding protein homolog (Drosophila)                             | Sobp     | 2.56    |
| NM_176860   | ubiquititin associated and SH3 domain containing, B                           | Ubash3b  | 2.56    |
| NM_010732   | leucine rich repeat protein 2, neuronal                                       | Lrrm2    | 2.52    |
| NM_031195   | macrophage scavenger receptor 1, transcript variant 1                        | Msr1     | 2.52    |
| NM_020578   | EH-domain containing 3                                                        | Ehd3     | 2.48    |
| NM_011573   | testis expressed gene 264, transcript variant 1                              | Tex264   | 2.48    |
| NM_013562   | interferon-related developmental regulator 1                                 | Ifrd1    | 2.4     |
| NM_019576   | thrombospondin, type I, domain 1, transcript variant 1                        | Thsd1    | 2.39    |
| NM_170684   | copine VII                                                                    | Cnbd7    | 2.38    |
| NM_029116   | kelch repeat and BTB (POZ) domain containing 11                              | Kbtbd11  | 2.38    |
| NM_010706   | lectin, galactose binding, soluble 4                                         | Lgals4   | 2.37    |
| NM_176834   | ring finger protein 208                                                       | Rnf208   | 2.37    |
| NM_011029   | ribosomal protein SA                                                          | Rpsa     | 2.36    |
| NM_026146   | EPS8-like 1                                                                   | Eps8l1   | 2.34    |
| NM_178884   | obscurin-like 1                                                               | Obsl1    | 2.33    |
| NM_146008   | t-complex 11 (mouse) like 2                                                   | Tcp11l2  | 2.32    |
| NM_026835   | membrane-spanning 4-domains, subfamily A, member 6D                           | Ms4a6d   | 2.31    |
| NM_001085507| zinc finger and BTB domain containing 34                                      | Zbb34    | 2.31    |
| NM_133898   | NEDD4 binding protein 2-like 1                                                | N4bp21   | 2.3     |
| NM_001081652| NAC alpha domain containing                                                   | Nacad    | 2.3     |
| NM_001162974| leucine rich repeat containing 51, transcript variant 3                       | Lrrc51   | 2.29    |
| NM_001038592| glutaredoxin 2 , transcript variant 1                                         | Glr2x    | 2.28    |
| NM_001205353| GRAM domain containing 4, transcript variant 2                                | Gramd4   | 2.28    |
| NM_144797   | meteorin, glial cell differentiation regulator-like                           | Metml    | 2.28    |
| NM_001159577| ligand of numb-protein X 1 , transcript variant 1                             | Lnx1     | 2.24    |
| NM_0027898  | GRAM domain containing 1A                                                     | Gramd1a  | 2.23    |
| NM_001136259| target of myb1 homolog, transcript variant 2                                 | Tom1     | 2.22    |
| NM_0009150  | selenium binding protein 1                                                   | Selenbp1 | 2.2     |
| NM_001164557| PDZK1 interacting protein 1 , transcript variant 1                            | Pdzk1p1  | 2.18    |
| NM_145853   | two pore channel 1                                                            | Tpcn1    | 2.17    |
| NM_053167   | tripartite motif-containing 9 , transcript variant 1                          | Trim9    | 2.17    |
| NM_027166   | yipee-like 5                                                                  | Ypel5    | 2.17    |
| NM_011157   | serglycin                                                                    | Srgn     | 2.16    |
| NM_026588   | syntaxin 19                                                                   | Stx19    | 2.16    |
| NM_001168514| mitogen-activated protein kinase 14 , transcript variant 4                   | Mapk14   | 2.15    |
| NM_178242   | trinucleotide repeat containing 18, transcript variant B                     | Tnrc18   | 2.14    |
| NM_009441   | tetratricopeptide repeat domain 3                                            | Ttc3     | 2.14    |
| NM_153507   | copine II                                                                    | Cnbd2    | 2.13    |
| NM_00124130 | leukocyte immunoglobulin-like receptor, subfamily B, member 4                | Llr1b4   | 2.13    |
| NM_001081235| meningioma 1                                                                  | Mn1      | 2.13    |
| NM_001024134| tripartite motif-containing 15, transcript variant 2                          | Trim15   | 2.13    |
| NM_011123   | proteolipid protein (myelin) 1                                                | Plp1     | 2.12    |
| NM_053166   | tripartite motif-containing 7                                                  | Trim7    | 2.12    |
| NM_181073   | MyTH4 domain member 1                                                         | Plekhh1  | 2.11    |
NM_133774  StAR-related lipid transfer (START) domain containing 4  Stard4  2.11
NM_001146022  WD repeat and FYVE domain containing 4  Wdfy4  2.11
NM_001008233  pleckstrin homology domain containing, family N member 1  Plekhn1  2.1
NM_177775  extended synaptotagmin-like protein 3  Esyt3  2.07
NM_026235  La ribonucleoprotein domain family, member 6  Larp6  2.07
NM_019814  HIG1 domain family, member 1A  Hgda1a  2.06
NM_177185  ubiquinol 2  Ubn2  2.06
NM_001256057  predicted gene 11570  Gm11570  2.05
NM_177694  multiple EGF-like-domains 9  Megf9  2.05
NM_026235  La ribonucleoprotein domain family, member 6  Larp6  2.07
NM_019814  HIG1 domain family, member 1A  Hgda1a  2.06
NM_177185  ubiquinol 2  Ubn2  2.06
NM_001256057  predicted gene 11570  Gm11570  2.05
NM_172694  multiple EGF-like-domains 9  Megf9  2.05
NM_177632  family with sequence similarity 43, member A  Fam43a  2.04
NM_001146043  G elongation factor, mitochondrial 2, transcript variant 2  Gfm2  2.04
NM_027116  NTPase, KAP family P-loop domain containing 1  Nkpd1  2.04
NM_019814  HIG1 domain family, member 1A  Hgda1a  2.06
NM_177185  ubiquinol 2  Ubn2  2.06
NM_001256057  predicted gene 11570  Gm11570  2.05
NM_172694  multiple EGF-like-domains 9  Megf9  2.05
NM_177632  family with sequence similarity 43, member A  Fam43a  2.04
NM_001146043  G elongation factor, mitochondrial 2, transcript variant 2  Gfm2  2.04
NM_027116  NTPase, KAP family P-loop domain containing 1  Nkpd1  2.04
NM_019814  HIG1 domain family, member 1A  Hgda1a  2.06
NM_177185  ubiquinol 2  Ubn2  2.06
NM_001256057  predicted gene 11570  Gm11570  2.05

Protein folding

NM_028430  peptidylprolyl isomerase (cyclophilin)-like 6  Ppil6  2.25
NM_018808  DnaJ (Hsp40) homolog, subfamily B, member 1  Dnajb1  2.23

Proteolysis

NM_013459  complement factor D (adipsin)  Cfd  11.31
NM_177322  angiotensin II receptor, type 1a  Agtr1a  8.65
NM_011414  secretory leukocyte peptidase inhibitor  Slpi  7.4
NM_008871  serine (or cysteine) peptidase inhibitor, clade E, member 1  Serpine1  6.57
NM_01252569  serine (or cysteine) peptidase inhibitor, clade A, member 1, transcript variant 2  Serpina1a  3.91
NM_133753  ERBB receptor feedback inhibitor 1  Errf1  3.83
NM_01199940  serine (or cysteine) peptidase inhibitor, clade A, member 3I  Serpina3i  3.72
NM_015790  Icos ligand  Icosl  3.69
NM_010511  interferon gamma receptor 1  Ifngr1  3.56
NM_009247  serine (or cysteine) peptidase inhibitor, clade A, member 1E  Serpina1e  3.47
NM_028660  kallikrein related-peptidase 9  Klk9  3.39
NM_009245  fatty acid binding protein 4, adipocyte  Fabp4  3.12
NM_009776  serine (or cysteine) peptidase inhibitor, clade G, member 1  Serping1  3.09
NM_011113  plasminogen activator, urokinase receptor  Plaur  2.99
NM_009543  ring finger protein 103  Rnf103  2.98
NM_009246  cytosolic T lymphocyte-associated protein 2 alpha, transcript variant 1  Cta2a  2.87
NM_01025439  calcium/calmodulin-dependent protein kinase II, delta, transcript variant 1  Camk2d  2.62
NM_016845  proacrosin binding protein, transcript variant 1  Acrbp  2.61
NM_026414  aspartic peptidase, retroviral-like 1  Asprv1  2.61
NM_019932  platelet factor 4  Pf4  2.47
NM_01039042  kallikrein related-peptidase 13  Klk13  2.42
NM_007797  cytotoxic T lymphocyte-associated protein 2 beta, transcript variant 1  Cta2b  2.41
| Gene ID          | Description                                                                 | Log2 FC |
|-----------------|------------------------------------------------------------------------------|---------|
| NM_008906       | cathepsin A, transcript variant 1                                             | Ctsa    |
| NM_173749       | peptidase domain containing associated with muscle regeneration 1           | Pamr1   |
| NM_001040106    | AP2 associated kinase 1, transcript variant 1                                | Aak1    |
| NM_178730       | transmembrane protease, serine 11f                                          | Tmprss11f|
| NM_028894       | LON peptidase N-terminal domain and ring finger 3                            | Lonrf3  |
| NM_011177       | kalikrein related-peptidase 6, transcript variant 1                         | Klk6    |
| NM_183284       | serine peptidase inhibitor, Kazal type 2                                    | Spink2  |
| NM_01081115     | non-specific cytotoxic cell receptor protein 1 homolog (zebrafish)          | Nccrp1  |
| NM_052976       | oligophrenin 1                                                               | Ophn1   |
| NM_178694       | zyg-11 related, cell cycle regulator                                         | Zer1    |
| NM_139147       | Rab40b, member RAS oncogene family                                          | Rab40b  |
| NM_007899       | extracellular matrix protein 1, transcript variant 1                         | Ecm1    |
| NM_001001803    | serine peptidase inhibitor, Kazal type 7 (putative)                         | Spink7  |
| NM_011756       | zinc finger protein 36                                                       | Zfp36   |
| NM_007475       | ribosomal protein, large, P0                                                 | Rplp0   |
| BC096413        | ribosomal protein L37a                                                       | Rpl37a  |
| NM_001114079    | poly(A) binding protein, cytoplasmic 1-like                                 | Pabpc1l |
| NM_133819       | protein phosphatase 1, regulatory (inhibitor) subunit 15b                   | Ppp1r15b|
| NM_009095       | ribosomal protein S5                                                         | Rps5    |
| NM_033541       | 2'-5' oligoadenylate synthetase 1C                                            | Oas1c   |
| NM_025963       | ribosomal protein S10                                                        | Rps10   |
| NM_026020       | ribosomal protein, large P2                                                 | Rplp2   |
| NM_025919       | CLK4-associating serine/arginine rich protein, transcript variant L          | Clasrp  |
| NM_053255       | elaC homolog 1                                                               | Elac1   |
| NM_052959       | ribosomal protein L11                                                        | Rpl11   |
| NM_175937       | cytoplasmic polyadenylation element binding protein 2, transcript variant 1 | Cpeb2   |
| NM_175529       | leukocyte receptor cluster (LRC) member 9                                    | Leng9   |
| NM_011287       | ribosomal protein L10A                                                       | Rpl10a  |
| NM_001024837    | adenosine deaminase, RNA-specific, B1, transcript variant 2                  | Adarb1  |
| NM_008876       | chemokine (C-X-C motif) ligand 1                                             | Cxcl1   |
| NM_009117       | serum amyloid A 1                                                            | Saa1    |
| NM_011333       | chemokine (C-C motif) ligand 2                                               | Ccl2    |
| NM_008361       | interleukin 1 beta                                                          | Il1b    |
| NM_009627       | adrenomedullin                                                              | Adm     |
| NM_007707       | suppressor of cytokine signaling 3                                           | Socs3   |
| NM_007913       | early growth response 1                                                      | Egr1    |
| NM_015811       | regulator of G-protein signaling 1                                          | Rgs1    |
| NM_0011338      | chemokine (C-C motif) ligand 9                                               | Ccl9    |
| NM_177868       | forkhead-associated (FHA) phosphopeptide binding domain 1                   | Fhad1   |
| NM_013652       | chemokine (C-C motif) ligand 4                                               | Ccl4    |
| NM_015776       | microfibrillar associated protein 5                                          | Mfap5   |
| NM_026577       | ADP-ribosylation factor-like 13B                                             | Arl13b  |
| NM_029083       | DNA-damage-inducible transcript 4                                           | Ddit4   |
| NM_008344       | insulin-like growth factor binding protein 6                                 | Igfbp6  |
| NM_011817       | growth arrest and DNA-damage-inducible 45 gamma                             | Gadd45g |
| NM_009615       | a disintegrin and metalloproteinase domain 17                                | Adam17  |

**RNA processing**

| Gene ID          | Description                                                                 | Log2 FC |
|-----------------|------------------------------------------------------------------------------|---------|
| NM_011176       | ribosomal protein, large, P0                                                 | Rplp0   |
| NM_025963       | ribosomal protein S10                                                        | Rps10   |
| NM_026020       | CLK4-associating serine/arginine rich protein, transcript variant L          | Clasrp  |
| NM_025919       | ribosomal protein L11                                                        | Rpl11   |
| NM_175937       | cytoplasmic polyadenylation element binding protein 2, transcript variant 1 | Cpeb2   |
| NM_175529       | leukocyte receptor cluster (LRC) member 9                                    | Leng9   |
| NM_011287       | ribosomal protein L10A                                                       | Rpl10a  |
| NM_001024837    | adenosine deaminase, RNA-specific, B1, transcript variant 2                  | Adarb1  |

**Signalling**

| Gene ID          | Description                                                                 | Log2 FC |
|-----------------|------------------------------------------------------------------------------|---------|
| NM_00876         | interleukin 1 beta                                                          | Il1b    |
| NM_007707       | suppressor of cytokine signaling 3                                           | Socs3   |
| NM_007913       | early growth response 1                                                      | Egr1    |
| NM_015811       | regulator of G-protein signaling 1                                          | Rgs1    |
| NM_0011338      | chemokine (C-C motif) ligand 9                                               | Ccl9    |
| NM_177868       | forkhead-associated (FHA) phosphopeptide binding domain 1                   | Fhad1   |
| NM_013652       | chemokine (C-C motif) ligand 4                                               | Ccl4    |
| NM_015776       | microfibrillar associated protein 5                                          | Mfap5   |
| NM_026577       | ADP-ribosylation factor-like 13B                                             | Arl13b  |
| NM_029083       | DNA-damage-inducible transcript 4                                           | Ddit4   |
| NM_008344       | insulin-like growth factor binding protein 6                                 | Igfbp6  |
| NM_011817       | growth arrest and DNA-damage-inducible 45 gamma                             | Gadd45g |
| NM_009615       | a disintegrin and metalloproteinase domain 17                                | Adam17  |
| Gene ID       | Description                                                                 | log2 Fold Change |
|--------------|------------------------------------------------------------------------------|-----------------|
| NM_009061    | regulator of G-protein signaling 2                                           | 3.28            |
| NM_017466    | chemokine (C-C motif) receptor-like 2                                          | 3.27            |
| NM_020622    | family with sequence similarity 3, member B                                   | 3.19            |
| NM_009841    | CD14 antigen                                                                  | 3.17            |
| NM_146491    | olfactory receptor 1410                                                      | 3.14            |
| NM_011905    | toll-like receptor 2                                                          | 3.14            |
| NM_177137    | guanine nucleotide binding protein, alpha stimulating, olfactory type, transcript variant 2 | 3.07            |
| NM_145857    | nucleotide-binding oligomerization domain containing 2                        | 2.99            |
| NM_172718    | small G protein signaling modulator 1, transcript variant 1                  | 2.99            |
| NM_009017    | retinoic acid early transcript beta                                           | 2.95            |
| NM_01274     | chemokine (C-X-C motif) ligand 10                                             | 2.84            |
| NM_01163262  | c-Maf inducing protein, transcript variant 1                                  | 2.8             |
| NM_027106    | arginine vasopressin-induced 1                                               | 2.77            |
| NM_010276    | GTP binding protein                                                          | 2.76            |
| NM_008855    | protein kinase C, beta                                                       | 2.62            |
| NM_021274    | chemokine (C-C motif) ligand 10                                               | 2.61            |
| NM_001163634 | Wnt7b, transcript variant 2                                                   | 2.59            |
| NM_178256    | RALBP1 associated Eps domain containing protein 2                            | 2.58            |
| NM_007706    | suppressor of cytokine signaling 2, transcript variant 1                    | 2.57            |
| NM_013693    | tumor necrosis factor                                                        | 2.52            |
| NM_025540    | sarcolipin                                                                   | 2.46            |
| NM_001081155 | Rap1 GTPase-activating protein , transcript variant 1                        | 2.45            |
| NM_009184    | PTK6 protein tyrosine kinase 6                                                | 2.44            |
| NM_010592    | Jun proto-oncogene related gene d                                            | 2.43            |
| NM_011058    | platelet derived growth factor receptor, alpha polypeptide , transcript variant 1 | 2.42            |
| NM_010831    | salt inducible kinase 1                                                      | 2.39            |
| NM_008773    | purinergic receptor P2Y, G-protein coupled 2                                 | 2.37            |
| NM_025404    | ADP-ribosylation factor-like 4D                                               | 2.36            |
| NM_022019    | dual specificity phosphatase 10                                              | 2.36            |
| NM_008343    | insulin-like growth factor binding protein 3                                 | 2.33            |
| NM_001130409 | PTK2 protein tyrosine kinase 2, transcript variant 2                        | 2.32            |
| NM_001081212 | insulin receptor substrate 2                                                 | 2.31            |
| NM_178111    | transformation related protein 53 inducible nuclear protein 2                | 2.3             |
| NM_178258    | interleukin 22 receptor, alpha 2                                             | 2.28            |
| NM_013584    | leukemia inhibitory factor receptor, transcript variant 1                   | 2.28            |
| NM_198703    | WNK lysine deficient protein kinase 1, transcript variant 1                 | 2.28            |
| NM_001035533 | A kinase (PRKA) anchor protein 2, transcript variant 1                       | 2.25            |
| NM_018883    | calcium/calmodulin-dependent protein kinase kinase 1, alpha                  | 2.24            |
| NM_021306    | endothelin converting enzyme-like 1                                          | 2.24            |
| NM_010559    | interleukin 6 receptor, alpha                                                | 2.22            |
| NM_175445    | Ras association (RalGDS/AF-6) domain family member 2                        | 2.22            |
| NM_011530    | (MDR/TAP)                                                                    | 2.16            |
| NM_139307    | vasorin                                                                      | 2.16            |
| NM_010950    | numb-like                                                                    | 2.15            |
| NM_133924    | sorting nexin family member 2                                                | 2.12            |
| NM_001025250 | vascular endothelial growth factor A, transcript variant 1                  | 2.1             |
| NM_007557    | bone morphogenetic protein 7                                                 | 2.09            |
| NM_001002842 | PML-RAR alpha-regulated adaptor molecule 1 (Pram1), transcript variant 1   | 2.09            |
| BC122879     | nebullette                                                                   | 2.05            |
| NM_080843    | suppressor of cytokine signaling 4                                            | 2.02            |
| Gene Accession | Gene Symbol | Description | Expression Ratio |
|---------------|-------------|-------------|------------------|
| NM_146322     | Olfactory receptor 187 | Olfr187 | 2.01 |
| NM_178710     | Salt inducible kinase 2 | Sik2 | 2.01 |
| NM_001081412  | Breakpoint cluster region | Bcr | 2 |

**Transcription**

| Gene Accession | Gene Symbol | Description | Expression Ratio |
|---------------|-------------|-------------|------------------|
| NM_001077364  | TSC22 domain family, member 3, transcript variant 1 | Tsc22d3 | 13.68 |
| NM_007498     | Activating transcription factor 3 | Atf3 | 7.41 |
| NM_008036     | FBG osteosarcoma oncogene B | Fosb | 7.34 |
| NM_010444     | Nuclear receptor subfamily 4, group A, member 1 | Nr4a1 | 7.12 |
| NM_010234     | FBG osteosarcoma oncogene | Fos | 6.58 |
| NM_010828     | Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxyl-terminal domain, 2 | Cited2 | 6.21 |
| NM_007679     | CCAAT/enhancer binding protein (C/EBP), delta | Cebpd | 5.67 |
| NM_153287     | Cysteine-serine-rich nuclear protein 1 | Csrnp1 | 4.92 |
| NM_001033324  | Zinc finger and BTB domain containing 16 | Zibt16 | 4.28 |
| NM_010591     | Jun oncogene | Jun | 4.23 |
| NM_016868     | Hif3a | 4.01 |
| NM_007914     | Ets homologous factor | Ehf | 3.86 |
| NM_008390     | Interferon regulatory factor 1, transcript variant 1 | Irf1 | 3.81 |
| NM_001113333  | Cryptochrome 2 (photolyase-like), transcript variant 2 | Cry2 | 3.67 |
| NM_010638     | Kruppel-like factor 9 | Klf9 | 3.46 |
| NM_010907     | Nuclear factor of kappa light polypeptide gene enhancer in B cells inhibitor, alpha | Nfkbia | 3.39 |
| NM_021897     | Transformation related protein 53 inducible nuclear protein 1, transcript variant 1 | Trp53inp1 | 3.39 |
| NM_010755     | V-maf musculoaponeurotic fibrosarcoma oncogene family, protein F | Maff | 3.33 |
| NM_008452     | Kruppel-like factor 2 | Klf2 | 3.14 |
| NM_027477     | Zinc finger protein 398, transcript variant 1 | Zfp398 | 3.06 |
| NM_013874     | D4, zinc and double PHD fingers family 1 | Dpf1 | 3 |
| NM_010235     | Fos-like antigen 1 | Fosl1 | 2.99 |
| NM_009821     | Runt related transcription factor 1, transcript variant 4 | Runx1 | 2.97 |
| NM_017373     | Nuclear factor, interleukin 3, regulated | Nfil3 | 2.94 |
| NM_030612     | Nuclear factor of kappa light polypeptide gene enhancer in B cells inhibitor, zeta, transcript variant 1 | Nfkbiz | 2.88 |
| NM_010056     | Distal-less homeobox 5, transcript variant 1 | Dlx5 | 2.79 |
| NM_009565     | Zinc finger and BTB domain containing 7B | Zbtb7b | 2.71 |
| NM_011276     | Ring finger protein, LIM domain interacting | Rlim | 2.7 |
| NM_010499     | Immediate early response 2 | Ier2 | 2.63 |
| NM_023755     | Transcription factor CP2-like 1 | Tcfcp2l1 | 2.58 |
| NM_027947     | Zinc finger and BTB domain containing 43, transcript variant 1 | Zbtb43 | 2.57 |
| NM_011498     | Basic helix-loop-helix family, member e40 | Bhlhe40 | 2.48 |
| NM_009637     | AE binding protein 2, transcript variant 3 | Aebp2 | 2.47 |
| NM_153599     | Cyclin-dependent kinase 8 | Cdk8 | 2.47 |
| NM_020610     | Nuclear receptor interacting protein 3 | Nrip3 | 2.46 |
| NM_023184     | Kruppel-like factor 15 | Klf15 | 2.42 |
| NM_183208     | Zinc finger, MIZ-type containing 1 | Zmiz1 | 2.4 |
| NM_013519     | Forkhead box C2 | Foxc2 | 2.39 |
| NM_001029929  | Zinc finger, MYND-type containing 15 | Zmynd15 | 2.38 |
| NM_010137     | Endothelial PAS domain protein 1 | Epsa1 | 2.37 |
| NM_021397     | Zinc finger and BTB domain containing 32 | Zbtb32 | 2.37 |
| NM_027264     | Zinc finger protein 715 | Zfp715 | 2.34 |
| NM_011803     | Kruppel-like factor 6 | Klf6 | 2.3 |
| NM_175606     | HOP homeobox, transcript variant 1 | Hopx | 2.29 |
| NM_011753     | Zinc finger protein 26 | Zfp26 | 2.29 |
| Gene ID       | Gene Name                                                                 | Fold Change |
|--------------|---------------------------------------------------------------------------|-------------|
| NM_177993    | high mobility group box transcription factor 1, transcript variant 2     | Hbp1        | 2.25        |
| NM_011066    | period circadian clock 2                                                 | Per2        | 2.22        |
| NM_01100460  | zinc finger and BTB domain containing 42                                 | Zbtb42      | 2.22        |
| NM_009744    | B cell leukemia/lymphoma 6                                               | Bcl6        | 2.19        |
| NM_008554    | achaete-scute complex homolog 2 (Drosophila)                            | Ascl2       | 2.15        |
| NM_001025577 | avian musculoaponeurotic fibrosarcoma (v-maf) AS42 oncogene homolog      | Maf         | 2.15        |
| NM_177660    | zinc finger and BTB domain containing 10                                 | Zbtb10      | 2.15        |
| NM_009884    | CCAAT/enhancer binding protein (C/EBP), gamma v-maf musculoaponeurotic fibrosarcoma oncogene family, protein B | CebpG       | 2.06        |
| NM_010658    | homeobox B9                                                              | Hoxb9       | 2.03        |
| NM_01009935  | thioredoxin interacting protein, transcript variant 1                    | Txnip       | 2.03        |
| NM_177790    | zinc finger protein 385C                                                 | Zfp385c     | 2.01        |
| NM_001029838 | Pbx/knotted 1 homeobox 2 , transcript variant 2                          | Pknox2      | 2.01        |
| NM_172643    | zinc finger and BTB domain containing 41 homolog                         | Zbtb41      | 2.01        |
| NM_031391    | general transcription factor II A, 1, transcript variant 1               | Gtf2a1      | 2            |

**Transport**

| Gene ID       | Gene Name                                                                 | Fold Change |
|--------------|---------------------------------------------------------------------------|-------------|
| NM_008432    | potassium channel, subfamily U, member 1                                  | Kcnu1       | 2.48        |
| NM_020506    | exportin 4                                                                | Xpo4        | 2.09        |
| NM_029491    | trafficking protein particle complex 8, transcript variant 2              | Trappc8     | 2.04        |
| NM_011324    | sodium channel, nonvoltage-gated 1 alpha                                  | Scnn1a      | 2.03        |
| NM_172476    | transmembrane channel-like gene family 7                                   | Tmc7        | 2.01        |

*genes validated by qPCR