MicroRNA-27b-3p downregulates FGF1 and aggravates pathological cardiac remodelling

Guoqi Li#, Yihui Shao#, Hong-Chang Guo, Ying Zhi, Bokang Qiao, Xinying Yang, Yong-Qiang Lai*, Jie Du *, Yulin Li *

Beijing Anzhen Hospital, Capital Medical University; The Key Laboratory of Remodelling-Related Cardiovascular Diseases, Ministry of Education; Beijing Institute of Heart Lung and Blood Vessel Diseases, Beijing 100029, China

# equal contribution

*Corresponding author: Yong-Qiang Lai yongqianglai@yahoo.com or Jie Du, jiedu@ccmu.edu.cn or Yulin Li, lyllyl_1111@163.com

(Tel: 86-10-64456030; fax: 86-10-64456094).
S1: Loss of miR-27b-3p attenuates pathological cardiac remodelling in mice undergone pressure overload.

A. The schematic diagram of generating transgenic mice (miR-27b-3p-null), missing 10 bases in one strand compared to wildtype mice. B. PW Doppler images of the aorta from sham- or TAC-operated mice are shown. The peak aortic velocity obtained from PW Doppler imaging was used to calculate the pressure gradient according to the modified Bernoulli equation. These data confirm the success of the TAC surgery, which generated a pressure gradient of ~70 mmHg. *P < 0.05 vs. Sham. (n = 6).

C. miR-27b was expressed in multiple tissues of wildtype and knockout mice (n = 6). D. qPCR shows expression of miR-27b-3p cluster (miR-27a, miR-23a, miR-23b, miR-24) in heart tissue of wild type and knockout mice (n = 6). E. Measurements of the LV wall thickness during systole (LVPWs) and diastole (LVPWd) and the LV internal diameters during systole (LVIDs) and diastole (LVIDd) in wild-type and KO mice after TAC surgery or sham operation. (WT n = 6, KO, n = 7). All data are shown as mean ± SD. *P < 0.05 compared to sham (B) or WT (C, D) or sham/WT (E, F); #P < 0.05 compared to WT/TAC. For two groups, data were compared by 2-sample t test; for more than two groups, data were compared by two-way ANOVA with Bonferroni post-hoc test.
S2: Identified the candidate target genes of miR-27b-3p

A, Western blot image of protein expression in whole heart of wildtype and miR-27b-3p-null mice after TAC. B-E, Quantification of protein expression of Smad3, P-Smad3, NF-kB p65, and MAC-2 (n = 6), normalised to GAPDH. F, qPCR shows expression of miR-27b-3p in heart tissue after sham or AngII infusion operation. (n = 6). G, Measurements of the LV internal diameters during systole (LVIDs) and diastole (LVIDd) in wild-type and miR-27b-3p-null mice after AngII infusion operation. (WT n = 6, KO, n = 7). H, Sixteen genes selected as candidate target genes of miR-27b-3p. I, Predicted miR-27b-3p binding sites on PPAR-γ and Dram2. J, Western blot analysis shows the expression of FGF1 in different tissues (heart, kidney, fat, liver) (n = 6). K-L, qPCR shows expression of miR-27b-3p in H9c2 cells treated with NC-mimic or miR-27b-3p mimic, western blot analysis shows the protein expression of PPAR-γ in H9c2 cells treated with NC-inhibitor or miR-27b-3p inhibitor (n = 6). All data are shown as mean ± SD. *P < 0.05 compared to WT (B, C, D, E) or sham (F) or NC-mimic (K), NC-inhibitor (L); #P<0.05 compared to WT/TAC. For two groups, data were compared by 2-sample t test; for more than two groups, data were compared by one-way ANOVA with Bonferroni post-hoc test.
rFGF1 inhibits isolated neonatal mouse cardiomyocytes (NCMs) hypertrophy was induced by miR-27b-3p mimic

A

NC-mimic/vehicle  NC-mimic/rFGF1  mimic/vehicle  mimic/rFGF1

DAPI

- Actinin

Merge

Relative cell surface area

B

Relative ANP mRNA expression

C

Relative BNP mRNA expression

D

NC-mimic/vehicle  mimic/vehicle  mimic/rFGF1

ANP

BNP

GAPDH

32KD  18KD  36KD

Relative ANP protein expression

Relative BNP protein expression

A-C, Isolated neonatal mouse cardiomyocytes (NCMs) were administered rFGF1 or miR-27b-3p mimic, NC-mimic or vehicle as control, respectively. Cardiomyocytes were stained for α-actinin (green), and DAPI staining was used to visualise the nuclei (blue). Scale bar, 15 μm. ANP and BNP transcript levels were quantitated using real-time PCR. D, Western blot analysis shows the protein expression of BNP, ANP in rFGF1 treated primary cardiomyocytes with miR-27b-3p mimic or NC-mimic, GAPDH as a loading control (n = 6). *P < 0.05 vs NC-mimic/vehicle. #P < 0.05 vs mimic/vehicle. Data were compared by one-way ANOVA with Bonferroni post-hoc test.
S4: FGF1 attenuates the pathological cardiac remodelling

A. Heatmaps of the relative expression of the differentially expressed genes identified in RNA-sequencing of whole heart after pressure overload. B. The schematic diagram of beginning, duration and end time of the rFGF1 treatment. C. Western blot analysis shows the expression of P-Smad3 in vehicle- or rFGF1-treated mice undergone pressure overload (n = 6). D. qPCR shows expression of miR-27a and miR-27b-5p in heart tissue after TAC 0, 4, and 8 weeks of mice (n = 6). *P < 0.05 compared to vehicle (C), or 0 week (D). #P < 0.05 compared to vehicle/TAC (C). Data were compared by one-way ANOVA with Bonferroni post-hoc test.
SUPPLEMENTAL MATERIAL

Original Western Blots used for Figure 4F

Western blot analysis of FGF1 protein expression in NC-inhibitor or miR-27b-3p inhibitor treated cardiomyocytes, GAPDH was used as a loading control.

Original Western Blots used for Figure 4H

Western blot analysis of FGF1 protein expression in whole heart of wildtype or miR-27b-3p-null mice, GAPDH was used as a loading control.
Original Western Blots used for Figure 4J

Western blot analysis of FGF1 protein expression in whole heart of wildtype and mir27b-3p-null mice after TAC, GAPDH was used as a loading control.

Original Western Blots used for Figure 5G

Immunoblot for PGC-1α/PGC-1β in the heart from vehicle or rFGF1-treated 8 weeks in mice after TAC.
Original Western Blots used for Figure 5H

Immunoblot for PGC-1α/PGC-1β in H9c2 cells treated with vehicle or rFGF1, rFGF1/siFGFR1 for 24 hours.

\[ H \]

|          | Vehicle | rFGF1/Si-Ctrl | rFGF1/Si-FGFR1 |
|----------|---------|---------------|----------------|
| PG1α     |         |               |                |
| PG1β     |         |               |                |
| β-actin  |         |               |                |

| Proteins | Vehicle | rFGF1/Si-Ctrl | rFGF1/Si-FGFR1 |
|----------|---------|---------------|----------------|
| PG1α     |         |               |                |
| PG1β     |         |               |                |
| β-actin  |         |               |                |

- PG1α: 105kD
- PG1β: 113kD
- β-actin: 42kD
Original Western Blots used for Supplemental Figure 2J
Western blot analysis shows the protein expression of FGF1 in different tissues (heart, kidney, fat, liver).

Original Western Blots used for Supplemental Figure 2A
Western blot shows the protein expression of Smad3 and p-Sma3, NF-kB, MAC-2 protein expression in whole heart of wildtype and miR-27b-3p-null mice after TAC.
Western blot analysis shows the protein expression of PPAR-γ in H9c2 cells treated with NC-inhibitor or miR-27b-3p inhibitor.
Original Western Blots used for Supplemental Figure 3D

Western blot analysis shows the protein expression of BNP, ANP in rFGF1 treated primary cardiomyocytes with miR-27b-3p mimic or NC-mimic.
Original Western Blots used for Supplemental Figure 4C

Western blot analysis shows the protein expression of p-Smad3 in the heart from vehicle or rFGF1-treated 8 weeks in mice after TAC.
## 1 Table S1 The List Primer sequence of mRNA

| Number | Primer | Primer sequence (5’ to 3’) |
|--------|--------|-----------------------------|
| 1      | mMir27b-F | CGCCTTGTCGCCCTTTTGAAAA  |
| 2      | mMir27b-R | TGCAAACACAGCTCTTGAGGAG  |
| 3      | IL-1b-F  | TTACAGTGCAATGAGGATGAC  |
| 4      | IL-1b-R  | GTGAGGATTCGTAGCTGGAT  |
| 5      | Fgf1-F   | CCTGACCGAGAGGTTCAAC  |
| 6      | Fgf1-R   | GCCCTGGTCGCCCTTTGAC  |
| 7      | Grm1-F   | TGGAAACAGACATTAGTGTTCACT  |
| 8      | Grm1-R   | CAACTAGCTCCTCTAGTGCTGCC  |
| 9      | Ndufs4-F | CTGCCGTTTCGCTCTGAGAG  |
| 10     | Ndufs4-R | TGTTATTGCGAGCAGGAACAAA  |
| 11     | Pkia-F   | AGACAGAAAGTGGAAGTGATGG  |
| 12     | Pkia-R   | AGCAATGCCAGGAGATTCG  |
| 13     | Ech1-F   | GCACCGCGATGACAGTTTC  |
| 14     | Ech1-R   | TCAGAGATCGAAGGCTGATGTT  |
| 15     | Dram2-F  | GCTGCTTTGCGTTTTAGTATGG  |
| 16     | Dram2-R  | AGATAACCAACAGATGCGGACC  |
| 17     | Eeqd1-F  | GGCTGCCATCGCTCTATCC  |
| 18     | Eeqd1-R  | GGCTGCCATCGCTCTATCC  |
| 19     | Tnmem135-F | TCCCTCTGGCTTTAGGCA  |
| 20     | Tnmem135-R | GGGACTGTTGAGATTCTGTT  |
| 21     | Opa1-F   | TGGAAAAATGTTCCAGAGATCAG  |
| 22     | Opa1-R   | CATTCCTCTCTAGTTGTTCAAGCG  |
| 23     | Crebf-F  | AGCGTAAGCGGAATGGACC  |
| 24     | Crebf-R  | CAGGACAGTCTGTTGAGCTTCC  |
| 25     | Stand7-F | ACCAGTACCCAGGTTTTGGAAC  |
| 26     | Stand7-R | GAACCTCTAGAGACACTAACAGC  |
| 27     | Chth-F   | TTCCTGCTCTATGTTCCAGC  |
| 28     | Chth-R   | GGAAGTCTGCTTAAATGTTGTTG  |
| 29     | Tnmim6-F | TCCCACTATACTCCCTCGACA  |
| 30     | Tnmim6-R | GTGTGTGACACATGAGCAGATAG  |
| 31     | Aldh5a1-F | CGGTCAAGGAGAGGACTTAC  |
| 32     | Aldh5a1-R | GCACCGCGATGACAGTTTC  |
| 33     | Neuril4-F | TACCGACATGGCTCTGTTTT  |
| 34     | Neuril4-R | CCCATACCGGCTCCTACCTCA  |
| 35     | Nrbf2-F  | AAGGACCCCTCAACCTGTGCT  |
| 36     | Nrbf2-R  | AAGGACCCCTCAACCTGTGCT  |
| 37     | Hspd1-F  | CACAGTCTCTCCAGAGATGAG  |
| 38     | Hspd1-R  | CTACACCTCGAAGCATTAGGCC  |
| 39     | ANP-F    | GCTTCCAGGCCATATGGAG  |
| 40     | ANP-R    | GGGGGCATGACCTCATCTTT  |
| 41     | BNP-F    | GAGGTCACTCTCATCTCCCTG  |
| 42     | BNP-R    | GCCATTTTCCCTGACCTTTTCTC  |
| 43     | Ppargc1a-F | TTATGGAGTCACATAGAGTGTGCT  |
| 44     | Ppargc1a-R | CCACCTCAATCCACCCAGAAAG  |
| 45     | GAPDH-F  | AGTCCGTTGAGAAAGGCCATTTG  |
| 46     | GAPDH-R  | TGTAGACCATGTAGTTGAGGTCA  |
| 47     | SKA-F    | CCCAAAGCTAACCAGGGGAGAG  |
| 48     | SKA-R    | CCCAGAATCACCACAGGATGCC  |

## 2 The List sequence of miRNA

| Number | miRNA-mimic | Primer sequence |
|--------|-------------|----------------|
| 1      | miR27b-mimic | UUCACAGUGGCUAAGUUCUGC |
| 2      | miR27b-inhibitor | CGUUCUUGAAUCCGUGACACUU |
Regents or kits included Sirius red (Solarbio, Catalog: G1470, Beijing, China), miR-27b-3p mimic (Ribobio, Catalog: 61743, Guangzhou, China), mimic-NC (Ribobio Catalog: 61744), miR-27b-3p inhibitor (Ribobio, Catalog: 80613), inhibitor-NC (Ribobio, Catalog: 80615), Lipofectamine 3000 regent (Thermo Fisher Scientific, Catalog: L3000015, Boston, Massachusetts, USA), DAB (Thermo Fisher Scientific, Catalog: 34002), Opti-MEM (Thermo Fisher Scientific, Catalog: 31985062), si-FGFR1 (Santa Cruz Biotechnology, Catalog: sc-29317, Texas, USA), control si-RNA (Santa Cruz Biotechnology, Catalog: sc-37007), isoflurane (RWD Life Science, Catalog: R510-22, Shenzhen, China), AngII (Sigma-Aldrich, Catalog: 05-23-0101, Darmstadt, Germany), ISO (Sigma-Aldrich, Catalog: 1351005), DMEM (Thermo Fisher Scientific, Catalog: A4192101), Pentobarbital (Sigma-Aldrich, Catalog: P3761, Darmstadt, Germany), FBS (Gibco Life Technologies, Catalog: 10082147, Gaithersburg, MD, USA), WGA (CytoFlamma, Catalog: RCS113, Korea), Neonatal Heart Dissociation Kit (MACS, Catalog: 130-098-373, Germany), Cardiac Myocyte Medium (Cell Biologics, Catalog: M1263, Chicago, USA), Mito Stress Test Kit (Agilent Technologies, Catalog: 103015-100, California, USA), FGF1 ELISA kits (Bio-Techne, Catalog: DY4686-05, Minnesota, USA), BrdU (Selleck Chemicals, Catalog: S791895, Texas, USA). Antibodies included BNP (abcam, Catalog: ab19645, Cambridge Science Park, UK), ANP32E (abcam, Catalog: ab5993), FGF1 (abcam, Catalog: ab207321), Smad3 (Cell Signaling Technology CST, Catalog: #9523), Phospho-Smad3 (CST, Catalog: #9520), GAPDH (Zhong Shan Golden Bridge ZSGB, Catalog: TA309157, Beijing, China), PGC1α (abcam, Catalog: ab54481), PGC1β (abcam, Catalog: ab176328), FGFR1 (abcam, Catalog: ab206328), Mac-2(Santa Cruz Biotechnology, Catalog: sc-32790, Texas, USA), IL-1β (abcam, Catalog: ab9722), NF-κB p65 (abcam, Catalog: ab19870).
### Table S2 Baseline characteristics of control subjects and enrolled HCM patients

|                      | Donor (n=6) | HCM (n=6) | P-value       |
|----------------------|-------------|------------|---------------|
| **Clinical/demographic features** |             |            |               |
| Male, n (%)          | 6 (100)     | 5 (83)     | 1             |
| Age, years           | 52±6.83     | 53±3.88    | 0.7367        |
| Heart function classification, n (%)  |            |            |               |
| NYHA class I         | 6 (100)     | 0          | <0.0001       |
| NYHA class II        | 0           | 0          |               |
| NYHA class III       | 0           | 6 (100)    | <0.0001       |
| Family history of HCM| NO          | NO         |               |
| Hypertension, n (%)  | 0 (0)       | 6 (100)    | <0.0001       |
| **Drug treatment**   |             |            |               |
| β-blockers           | NO          | YES        | <0.0001       |
| Calcium channel blockers | NO      | YES        | <0.0001       |

NYHA : New York Heart Association
### SUPPLEMENTAL DATA: Differential expression genes between Ctrl/TAC and KO/TAC

| Gene ID | Gene_symbol | P.Value     | FC        | Regulation |
|---------|-------------|-------------|-----------|------------|
| 11304   | Abca4       | 0.020769594 | 2.765765766 | up         |
| 11306   | Abcb7       | 0.042373276 | 1.440286624 | up         |
| 11307   | Abcg1       | 0.043718034 | -1.20649652 | down       |
| 11363   | Acadl       | 0.037824265 | 1.377587033 | up         |
| 11364   | Acadm       | 0.027082118 | 1.633563166 | up         |
| 11370   | Acadvl      | 0.033350839 | 1.490936697 | up         |
| 11421   | Ace         | 0.006838616 | -2.313914881 | down       |
| 11492   | Adam19      | 0.018017676 | -2.434451902 | down       |
| 11504   | Adams1      | 0.042441427 | -1.652443755 | down       |
| 11607   | Agrp1a      | 0.049653102 | 1.71871714  | up         |
| 11622   | Ahr         | 0.004912152 | 1.940350877 | up         |
| 11641   | Akap2       | 0.031445582 | -1.554529717 | down       |
| 11651   | Akt1        | 0.008964881 | -1.348158131 | down       |
| 11668   | Aldh1a1     | 0.005510345 | -2.101957071 | down       |
| 11677   | Akrlb3      | 0.021660505 | 1.348249684 | up         |
| 11684   | Alox12      | 0.009124551 | 1.96039604  | up         |
| 11722   | Amy1        | 0.044529311 | 2.016620499 | up         |
| 11757   | Prdx3       | 0.012815876 | 1.264809301 | up         |
| 11774   | Ap3b1       | 0.006312238 | -1.211545231 | down       |
| 11785   | Apbb1       | 0.029966218 | 1.416741162 | up         |
| 11787   | Apbb2       | 0.040377812 | 1.261970716 | up         |
| 11807   | Apoa2       | 0.021615574 | 1.74789276  | up         |
| 11820   | App         | 0.030631421 | -1.284752654 | down       |
| 11832   | Aqp7        | 0.047912394 | 1.886749198 | up         |
| 11854   | Rhod        | 0.046754019 | -1.975806452 | down       |
| 11867   | Arpc1b      | 0.034454598 | -1.201342282 | down       |
| 11881   | Arsb        | 0.0100518   | -1.563411079 | down       |
| 11911   | Atf4        | 0.015385441 | -1.550769231 | down       |
| 11927   | Atox1       | 0.01670868  | -1.364679902 | down       |
| 11946   | Atp5a1      | 0.037466274 | 1.238179056 | up         |
| 11947   | Atp5b       | 0.010363123 | 1.205945037 | up         |
| 11949   | Atp5c1      | 0.003115826 | 1.264777639 | up         |
| 11950   | Atp5f1      | 0.009258584 | 1.457141984 | up         |
| 11981   | Atp9a       | 0.010797221 | -1.214978385 | down       |
| 12033   | Bcap29      | 0.020796256 | 1.643354083 | up         |
| 12040   | Bckdph      | 0.003351791 | 1.617180095 | up         |
| 12050   | Bcl2l2      | 0.012268825 | -1.285787321 | down       |
| 12051   | Bcl3        | 0.040893078 | -2.130387931 | down       |
| 12054   | Bcl7b       | 0.014884457 | -1.229494441 | down       |
| 12111   | Bgn         | 0.000675212 | -2.355314274 | down       |
| 12125   | Bcl2l11     | 0.022748193 | 1.576822917 | up         |
| 12153   | Bmp1        | 0.024388706 | -1.419223459 | down       |
| 12159   | Bmp4        | 0.012062776 | -1.4        | down       |
| 12257   | Tspo        | 0.005531836 | -1.649084249 | down       |
| 12258   | Serping1    | 0.015650562 | -1.821284706 | down       |
| 12262   | C1q1c       | 0.033706282 | -1.214301239 | down       |
| 12268   | C4b         | 0.012060854 | -2.5395189  | down       |
| Gene   | Fold Change | p-Value       | log2 Fold Change | Regulation |
|--------|-------------|---------------|-----------------|------------|
| C5ar1  | 0.025483694 | -1.648678414  |                 | down       |
| Ca1n1s | 0.028747671 | 1.807302231   |                 | up         |
| Anxa2  | 0.016924595 | -1.389582923  |                 | down       |
| Capn3  | 0.028618114 | 2.387096774   |                 | up         |
| Car11  | 0.039308759 | -2.365243004  |                 | down       |
| Ctnnd1 | 0.036372418 | -1.226836232  |                 | down       |
| Serpinh1| 0.039079971 | -1.621337318  |                 | down       |
| Ctl4   | 0.027608589 | 3.358108108   |                 | up         |
| Cd28   | 0.0077047   | 2.185840708   |                 | up         |
| Entpd2 | 0.025286583 | -1.494389027  |                 | down       |
| Entpd6 | 0.024687178 | 1.370592949   |                 | up         |
| Entpd5 | 0.014865552 | 1.641700231   |                 | up         |
| Cd59a  | 0.029446932 | 1.389422417   |                 | up         |
| Cd63   | 0.0099377   | -1.652539615  |                 | down       |
| Cd83   | 0.01587997  | -1.340320592  |                 | down       |
| Cdec45 | 0.015869762 | 1.363636364   |                 | up         |
| Ift81  | 0.016062341 | 1.755208333   |                 | up         |
| Cebpd  | 0.011184722 | -2.411733333  |                 | down       |
| Chkb   | 0.043448793 | 1.331686989   |                 | up         |
| Socs3  | 0.036100737 | -1.899470899  |                 | down       |
| Ccr5   | 0.037846945 | 2.496323529   |                 | up         |
| Cnag3  | 0.012323708 | 2.547619048   |                 | up         |
| Plk3   | 0.023260885 | -1.495633188  |                 | down       |
| Cobl   | 0.004228198 | -1.408921933  |                 | down       |
| Col4a4 | 0.041745505 | 1.759493671   |                 | down       |
| Col4a5 | 0.004175533 | -1.541645376  |                 | down       |
| Col5a2 | 0.021942195 | -2.169245648  |                 | down       |
| Col6a1 | 0.035355987 | -1.460520095  |                 | down       |
| Col6a2 | 0.047380854 | -1.45285382   |                 | down       |
| Col1a1 | 0.017794104 | -1.771174206  |                 | down       |
| Col1a2 | 0.00187376 | -2.178441747  |                 | down       |
| Comp   | 5.687954E-05| -8.505681818  |                 | down       |
| Coj7   | 0.010985786 | 1.30556801    |                 | up         |
| Cox5a  | 0.004722369 | 1.351403582   |                 | up         |
| Cox5b  | 0.006275471 | 1.263026477   |                 | up         |
| Cox7a1 | 0.00892567 | 1.436673862   |                 | up         |
| Cplx2  | 0.030432495 | -1.295983087  |                 | down       |
| Cradd  | 0.014575408 | 1.342982456   |                 | up         |
| Atf6b  | 0.032592582 | -1.315086782  |                 | down       |
| Crlf1  | 0.007865537 | -9.140794224  |                 | down       |
| Cry1   | 0.024235568 | -1.847068146  |                 | down       |
| Cryba4 | 0.004353499 | 2.69858871    |                 | up         |
| Crym   | 0.039542853 | -5.404761905  |                 | down       |
| Cs     | 0.036285397 | 1.242009646   |                 | up         |
| Csfl1r | 0.043650172 | -1.244377811  |                 | down       |
| Cs2rb2 | 0.048189233 | -2.077922078  |                 | down       |
| Ctn    | 0.002625828 | -1.440605072  |                 | down       |
| Cyb561 | 0.006076001 | -1.318885449  |                 | down       |
| Cyes   | 0.035887192 | 1.293329811   |                 | up         |
| Gene   | Log2Ratio | FoldChange |
|--------|-----------|------------|
| Cyp1a1 | 0.026403246 | 3.798449612 | up |
| Cyp4b1 | 0.049345018 | 1.521727395 | up |
| Dgka   | 0.007458008 | 1.305365297 | up |
| Dapk2  | 0.002001372 | -1.742630385 | down |
| Dbt    | 0.01073441  | 1.708362129 | up |
| Eci1   | 0.016082722 | 1.521727395 | up |
| Pebd1  | 0.036701169 | -2.308724832 | down |
| Gadd45a| 0.032851795 | 1.806075739 | up |
| Ddt    | 0.000885463 | 1.376059247 | up |
| Dld    | 0.042347488 | 1.528099437 | up |
| Dlg4   | 0.049624466 | -1.739932886 | down |
| Dbt    | 0.01420294  | 1.627737226 | up |
| Dnm1   | 0.003705223 | -1.900501672 | down |
| Dok    | 0.008527638 | -1.730563003 | down |
| Dpm2   | 0.00921492  | -1.222907036 | down |
| Atn1   | 0.034053292 | -1.416821994 | down |
| E2f3   | 0.041634284 | 1.359163592 | down |
| Edn1   | 0.041950854 | -1.592169657 | down |
| Efna1  | 0.024403178 | 1.289966489 | up |
| Rbdf1  | 0.000999077 | -1.36962546 | down |
| Egr2   | 0.033431122 | -8.763975155 | down |
| Egr3   | 0.024698822 | -4.855263158 | down |
| Eif2ak3| 0.021788939 | -1.278709677 | down |
| Eln    | 0.003142336 | -2.757206208 | down |
| Endog  | 0.024205886 | 1.297805948 | up |
| Eno3   | 0.021246807 | 1.420115743 | up |
| Ebp41l2| 0.025143572 | -1.285870158 | down |
| Ephb6  | 0.033244892 | -2.771929825 | down |
| Ephx2  | 0.028625998 | 1.67013373 | up |
| Khdrbs3| 2.59629E-05  | 1.414452075 | up |
| Etv6   | 0.011475177 | -1.271672772 | down |
| Acsl1  | 0.045284771 | 1.437119496 | up |
| Fah    | 0.009641114 | 2.256421419 | up |
| Fas    | 0.046654224 | 1.612487611 | up |
| Fat1   | 0.019634578 | -1.922005571 | down |
| Fbln2  | 0.010244218 | -1.974538032 | down |
| Fbp2   | 0.018289024 | 2.625392396 | up |
| Fen1   | 0.026776286 | 1.394021739 | up |
| Fgf1   | 0.00576768  | 1.430165685 | up |
| Fgfr1  | 0.037323731 | -1.95574086 | down |
| Fhl1   | 0.011354744 | 1.328539489 | up |
| Fhl2   | 0.02542978  | 2.132138864 | up |
| Ctgf   | 0.009401549 | -9.45902537 | down |
| Fkbp8  | 0.002237396 | -1.224795933 | down |
| Foxc2  | 0.049531575 | -3.334710744 | down |
| Foxs1  | 0.012893405 | -2.253731343 | down |
| Fmod   | 0.015860953 | -7.77262181 | down |
| Gene  | Log2 Fold Change | t-Value | Regulation |
|-------|-----------------|---------|------------|
| Fn1   | 0.014936086     | -2.285427807 | down      |
| Fstl1 | 0.042550777     | -1.99983632  | down      |
| Fut4  | 0.041791637     | 2.409090909 | up         |
| Fzd1  | 0.001372592     | -1.865965834 | down      |
| G0s2  | 0.012545844     | -1.394438555 | down      |
| Slc37a4| 0.039642143    | 1.214309821 | up         |
| Gvas  | 0.036608568     | 1.290615512 | up         |
| Tsc22d3| 0.02363199     | -1.346649871 | down      |
| Gli2  | 0.03974974      | -1.84      | down      |
| Glud1 | 0.023853036     | 1.209646576 | up         |
| Gna13 | 0.041247991     | -1.295     | down      |
| Gmnt  | 0.017461905     | 2.326589595 | up         |
| Pdpm  | 0.027513093     | -2.428726877 | down      |
| Cmkrl | 0.038116643     | -2.061915512 | down      |
| Gpx1  | 0.007688225     | -1.634177077 | down      |
| P3h3  | 0.019913396     | -1.809976247 | down      |
| Emg1  | 0.017524139     | 1.237646002 | up         |
| Grm1  | 0.034957537     | 1.428466077 | up         |
| Gstz1 | 0.024875754     | 1.386986751 | up         |
| H2-DMa| 0.020995614     | 1.73046875  | up         |
| Hsd17b10| 0.04691161    | 1.31227281  | up         |
| Hccs  | 0.031540689     | 1.292881484 | up         |
| Hdgf  | 0.005874749     | -1.219111635 | down      |
| Hes1  | 0.018082627     | 1.445655211 | up         |
| Hexa  | 0.011452374     | -1.352361924 | down      |
| Hey2  | 0.036885552     | 1.58013544  | up         |
| Hk1   | 0.007544948     | -1.334356016 | down      |
| Hmgn2 | 0.021050057     | 1.320014258 | up         |
| Hn1   | 0.022066998     | -1.573488206 | down      |
| Hoxb3 | 0.026172043     | -1.887096774 | down      |
| Hrc   | 0.03427562      | 1.545531736 | up         |
| Prmt2 | 0.012817498     | -1.457586207 | down      |
| Hsd17b7| 0.038012693   | 1.498936924 | up         |
| Hspd1 | 0.032243552     | 1.482700117 | up         |
| Idh1  | 0.000271435     | 1.464520986 | up         |
| Ier3  | 0.036295928     | -1.860644519 | down      |
| Itp   | 0.016685478     | 2.839416058 | up         |
| I15   | 0.022752092     | 2.097920696 | up         |
| Ii6st | 0.025846622     | -1.396444979 | down      |
| Irx3  | 0.016506777     | 2.442497262 | up         |
| Iga5  | 0.000431047     | -1.733495418 | down      |
| Itgb5 | 0.002014463     | -1.382397343 | down      |
| Itgb6 | 0.000817063     | 1.961251863 | up         |
| Itih2 | 0.043818889     | -3.755555556 | down      |
| Itk   | 0.014680125     | 1.858426966 | up         |
| Jarid2| 0.018718819     | 1.408783784 | up         |
| Junb  | 0.027241781     | -2.28765462 | down      |
| Gene     | Log2 Fold Change | p-value | Expression Direction |
|----------|-----------------|---------|----------------------|
| Kcnj2    | 0.009512771     | 2.03768624 | up                   |
| Kif1a    | 0.012417352     | -3.692307692 | down                 |
| Kif3c    | 0.013271313     | -1.266447368 | down                 |
| Kif2     | 0.044914908     | 1.206730769 | up                   |
| Klc1     | 0.003474354     | -1.361409323 | down                 |
| Kif4     | 0.036523095     | -1.432121212 | down                 |
| Klk1b26  | 0.003425312     | 8.157894737  | up                   |
| Krt18    | 0.005951144     | -9.311111111 | down                 |
| Ky       | 0.002184179     | 3.728542914  | up                   |
| Lbp      | 6.43603E-05     | -2.049856184 | down                 |
| Ldhb     | 0.018871933     | 1.506327445  | up                   |
| Lgals4   | 0.011282421     | 2.752462527  | up                   |
| Limp1    | 0.04527493      | -1.278106509 | down                 |
| Lmo2     | 0.027902765     | -1.600847757 | down                 |
| Phyh     | 0.006885363     | 1.204132762  | up                   |
| Lox1l    | 0.007121753     | -2.02020945  | down                 |
| Lrp1     | 0.002850607     | -2.082506654 | down                 |
| Ltbp3    | 0.001356439     | -1.898951138 | down                 |
| Alad     | 0.021644436     | 1.419041534  | up                   |
| Amacr    | 0.006999066     | 1.408386638  | up                   |
| Smad6    | 0.016324975     | -1.889196676 | down                 |
| Smad7    | 0.033027003     | -1.391534392 | down                 |
| Maff     | 7.35793E-05     | -2.111944605 | down                 |
| Mafg     | 0.042119052     | -1.720107742 | down                 |
| Mafk     | 0.042097124     | -1.892606868 | down                 |
| Mfap2    | 0.016828692     | -1.93504514  | down                 |
| Man2b2   | 0.039854843     | -1.270177296 | down                 |
| Mbd3     | 0.019938537     | -1.29017882  | down                 |
| Mcm7     | 0.02862861      | 1.206216831  | up                   |
| Slc3a2   | 0.004422881     | -1.374470018 | down                 |
| Mea1     | 0.010077434     | -1.203089615 | down                 |
| Meox1    | 0.036231091     | -3.14378921  | down                 |
| Mettl1   | 0.023360239     | -1.622674934 | down                 |
| Mfge8    | 0.011559774     | -1.226454657 | down                 |
| Mgp      | 0.032016059     | -2.55532467  | down                 |
| Mgmt     | 0.007903999     | 1.655084313  | up                   |
| Mitf     | 0.004390843     | 1.448539971  | up                   |
| Mme      | 0.049789082     | 2.038216561  | up                   |
| Mmp2     | 0.001901863     | -2.240243161 | down                 |
| Mras     | 0.008625346     | -1.413369714 | down                 |
| Mrc2     | 0.025352115     | -2.04129165  | down                 |
| Cited2   | 0.039273133     | 1.563963112  | up                   |
| Map1b    | 0.037896676     | -1.76146789  | down                 |
| Mthfr    | 0.016123693     | -1.399795501 | down                 |
| Commd1   | 0.003730136     | 1.282025881  | up                   |
| Ppp1r15a | 0.000108785     | -1.949029126 | down                 |
| Gadd45b  | 5.30113E-05      | 1.626079447  | up                   |
| Myl6     | 0.04864208      | -1.297495418 | down                 |
| Nbl1     | 0.008451404     | -2.112410987 | down                 |
| 17972 | Ncf4     | 0.045088564 | 1.367713004 | up            |
| 17992 | Ndufa4   | 0.032194193 | 1.307827862 | up            |
| 17993 | Ndufs4   | 0.009816641 | 1.523334828 | up            |
| 18016 | Nf2      | 0.04013468  | -1.244906932 | down          |
| 18019 | Nfatc2   | 0.014174601 | 1.41729639  | up            |
| 18024 | Nfe2l2   | 0.043313571 | -1.227411858 | down          |
| 18033 | Nfkb1    | 0.018110647 | -1.252310062 | down          |
| 18034 | Nfkb2    | 0.017560479 | -1.33697398  | down          |
| 18044 | Nfya     | 0.0123523   | -1.347314578 | down          |
| 18081 | Ninj1    | 0.003958376 | -1.235768345 | down          |
| 18091 | Nkx2-5   | 0.035580363 | -1.229206963 | down          |
| 18100 | Mrpl40   | 0.004176435 | 1.273265196  | up            |
| 18105 | Nqo2     | 0.009047041 | 1.488235294  | up            |
| 18113 | Nnmt     | 0.00077924  | -1.510638298 | down          |
| 18115 | Nnt      | 0.001073647 | 2.734572017  | up            |
| 18158 | Nppb     | 0.036536583 | -4.085167341 | down          |
| 18207 | Nthl1    | 0.033301642 | 1.532        | up            |
| 18220 | Nucb1    | 0.015154444 | -1.275865941 | down          |
| 18226 | Nup62    | 0.001634285 | -1.349740933 | down          |
| 18451 | P4ha1    | 0.029328311 | -2.147669706 | down          |
| 18542 | Pcolce   | 0.000762733 | -1.805675963 | down          |
| 18551 | Pcsk4    | 0.033962635 | 2.572815534  | up            |
| 18552 | Pcsk5    | 0.004618966 | -1.939534884 | down          |
| 18582 | Pde6d    | 0.043490519 | -1.222609983 | down          |
| 18585 | Pde9a    | 0.043870342 | -1.616224649 | down          |
| 18595 | Pdgfra   | 0.007621187 | -1.543509966 | down          |
| 18607 | Pdpk1    | 0.003297324 | -1.220521307 | down          |
| 18611 | Pea15a   | 0.009257323 | -1.28524366  | down          |
| 18639 | Pfkb1    | 0.044479335 | 5.508305648  | up            |
| 18647 | Cdk14    | 0.0121421   | -1.732265446 | down          |
| 18648 | Pgaml    | 0.002349505 | -1.426286037 | down          |
| 18674 | Slc25a3  | 0.005014083 | 1.291419412  | up            |
| 18739 | Pitpnm1  | 0.014815712 | -1.33843717  | down          |
| 18759 | Prkei    | 0.000385574 | -1.357965451 | down          |
| 18761 | Prkcq    | 0.025842435 | 2.233802817  | up            |
| 18767 | Pkia     | 0.035481996 | 1.502082448  | up            |
| 18793 | Plaur    | 0.025650438 | -1.72361809  | down          |
| 18807 | Pld3     | 0.005248744 | -1.396136314 | down          |
| 18821 | Pln      | 0.008816456 | 1.791403927  | up            |
| 18858 | Pmp22    | 0.018129714 | -1.597399004 | down          |
| 18950 | Pnp      | 0.023419175 | -1.342368641 | down          |
| 18951 | S-Sep    | 0.000735201 | -2.061010486 | down          |
| 19017 | Ppargc1a | 0.032221113 | 1.242105263  | up            |
| 19158 | Cyth2    | 0.000581678 | -1.226259131 | down          |
| 19186 | Psme1    | 0.0068049   | 1.546316891  | up            |
| 19188 | Psme2    | 0.047372527 | 1.22268098   | up            |
| 19207 | Ptc2     | 0.04347312  | -1.73006135  | down          |
| 19223 | Ptgis    | 0.049182278 | -2.238151659 | down          |
| 19246 | Pttn1    | 0.007446972 | -1.41855304  | down          |
| Gene   | log2FoldChange | adj.P.Val | direction |
|--------|----------------|-----------|------------|
| Ptprf  | 0.03839975     | -2.084639498 | down       |
| Ptx3   | 0.014033211    | -2.741573034 | down       |
| Abcd3  | 0.032704735    | 1.535362935 | up         |
| Pxm2   | 0.00058582     | 1.48850865  | up         |
| Rab12  | 0.024214408    | 1.209736537 | up         |
| Rab17  | 0.020543574    | 1.912878788 | up         |
| Rab23  | 0.046082612    | -1.449554896 | down       |
| Aldh1a2| 0.029314133    | -3.628719276 | down       |
| Rbm7   | 0.007723088    | 1.229652145 | up         |
| Rbp1   | 0.045907083    | -3.130499259 | down       |
| Rela   | 0.009238586    | -1.201421443 | down       |
| Mst1r  | 0.044869161    | -2.066225166 | down       |
| Rras   | 0.014344994    | -1.352279229 | down       |
| Rbas   | 0.0164283     | -1.24864938  | down       |
| Rtkn   | 0.0343493504   | 1.454621427 | up         |
| S100a11| 0.040996806    | -1.402728227 | down       |
| S100a13| 0.030645335    | -1.274575621 | down       |
| Pprx2  | 0.010066566    | -1.37748168  | down       |
| Ccl11  | 0.013127495    | 3.280373832  | up         |
| Ccl12  | 0.030541968    | -2.371819961 | down       |
| Ccl2   | 0.023067361    | -2.136631331 | down       |
| Serpinf| 0.01009686     | -2.377748168 | down       |
| Sfrp2  | 0.002548962    | -4.100952381 | down       |
| Sepw1  | 0.001906172    | -1.977325777 | down       |
| Sfrp1  | 0.014344994    | -1.352279229 | down       |
| Srsf2  | 0.014033211    | -2.741573034 | down       |
| Srsf5  | 0.038362781    | 1.7018414    | up         |
| Sgpl1  | 0.016024013    | -1.271053662 | down       |
| Sh3gl1 | 0.012277609    | -1.377445749 | down       |
| Sorbs3 | 0.004212921    | -1.354597292 | down       |
| St3gal1| 0.026217039    | -1.209401709 | down       |
| St3gal2| 0.041217667    | -1.266666667 | down       |
| St6galnac4| 0.044993054   | -1.221762048 | down       |
| St8sia4| 0.014511801    | 2.117408907  | up         |
| Ski    | 0.020935325    | -1.498602325 | down       |
| Skil   | 0.011322822    | -1.485232068 | down       |
| Slc1a3 | 0.031417457    | -2.329479769 | down       |
| Smpd2  | 0.002801617    | 1.41515622  | up         |
| Sna1   | 0.021242297    | -2.07980653 | down       |
| Sod2   | 0.025034632    | 1.380103787 | up         |
| Sod3   | 0.005303038    | -1.466046191 | down       |
| Sox9   | 0.007169909    | -3.443877551 | down       |
| Sphk1  | 0.001455228    | -2.761538462 | down       |
| Serpina3g| 0.042510801  | 2.510948905  | up         |
| Serpina3n| 0.035528451  | -3.208090379 | down       |
| Serpine2| 0.008625587   | -1.702135493 | down       |
| Spin1  | 0.025454657    | -1.249765552 | down       |
| Srf    | 0.004531921    | -1.498136955 | down       |
| Gene  | Description | Log2 Fold Change | Normalized Log2 Fold Change | Change |
|-------|-------------|-----------------|----------------------------|--------|
| Srm   |             | 0.006817185     | -1.282329432               | down   |
| Stat3 |             | 0.001748943     | -1.267526006               | down   |
| Stat6 |             | 0.03843167      | -1.228724194               | down   |
| Stx1a |             | 0.021108417     | -1.899390244               | down   |
| Sucl2 |             | 0.038467362     | 1.662046859                | up     |
| Sdc1  |             | 0.036659079     | -1.535051546               | down   |
| Syngr1|             | 0.010288081     | -1.364031487               | down   |
| Synj2 |             | 0.044552426     | 1.471495456                | up     |
| Tagln2|             | 0.004906357     | -1.429698448               | down   |
| Tcf21 |             | 0.040112735     | -1.890625                  | down   |
| Tgfb1 |             | 0.005450134     | -1.328423637               | down   |
| Tgfb2 |             | 0.026387199     | -1.386931155               | down   |
| Tgfr2 |             | 0.032296421     | -1.45308095                | down   |
| Tgfl1 |             | 0.011232236     | -1.621407334               | down   |
| Tgm2  |             | 0.000380099     | -1.64386936                | down   |
| Tf88  |             | 0.042952125     | 1.429435484                | up     |
| Tbs1  |             | 0.046152043     | -4.44403444                | down   |
| Tbs3  |             | 0.003842221     | -2.227587475               | down   |
| Trim24|             | 0.026623226     | 1.23977824                 | up     |
| Tle3  |             | 0.01799229      | -1.858695652               | down   |
| Tln1  |             | 0.015270257     | -1.290272774               | down   |
| Tnfrsf1a|          | 0.017218981     | -1.29310952                | down   |
| Tnfrsf1b|           | 0.041771429     | -1.516333938               | down   |
| Tp5211|             | 0.048402823     | 1.773345422                | up     |
| Traf3 |             | 0.004601236     | -1.367123288               | down   |
| Rpl13a|             | 0.032292713     | -1.235997899               | down   |
| Tuba1a|             | 0.005631928     | -1.493429487               | down   |
| Tub4a4|             | 0.003219964     | 1.581595195                | up     |
| Tubb4a|             | 0.041232752     | -1.325626204               | down   |
| Tubb5 |             | 0.048778235     | -1.260525394               | down   |
| Twist1|             | 0.0352784       | -2.070224719               | down   |
| Ube2b |             | 0.048397415     | 1.327081331                | up     |
| Ube2g2|             | 0.013519674     | -1.200929503               | down   |
| Slc35a2|            | 0.019903736     | -1.224662162               | down   |
| Dpysl3|             | 0.015988134     | -1.844880027               | down   |
| Urod  |             | 0.008590417     | 1.202281306                | up     |
| Uros  |             | 0.01230108      | 1.202609641                | up     |
| Vasp  |             | 0.019730269     | -1.2948903                 | down   |
| Lin7b |             | 0.005725886     | -2.951612903               | down   |
| Vim   |             | 0.025118893     | -1.597122302               | down   |
| Zmat3 |             | 0.043917403     | -1.205748865               | down   |
| Wisp2 |             | 0.047188711     | -3.575636888               | down   |
| Wt1   |             | 0.001693267     | -1.866666667               | down   |
| Xdh   |             | 0.029914347     | 1.587245233                | up     |
| Gene     | Log2FoldChange | P.Value   | Status  |
|----------|----------------|-----------|---------|
| Yap1     | -1.308951407   | 0.000320657 | down    |
| Ywhah    | -1.286872237   | 0.019756736 | down    |
| Zfp185   | -4.119402985   | 0.012748829 | down    |
| Zfp207   | -1.229934641   | 0.01835367  | down    |
| Zfand5   | 1.210685649    | 0.032949572 | up      |
| Zfp28    | 1.322775264    | 0.005493151 | up      |
| Zfp46    | 1.31260283     | 0.014945413 | up      |
| Zfp97    | 1.841549296    | 0.03125254  | up      |
| Zfp1     | -1.44808232    | 0.00845039  | down    |
| Zyx      | -1.732332516   | 0.002867382 | down    |
| Apc2     | -1.294287482   | 0.003702684 | down    |
| Ggt5     | 1.84282883     | 0.020332345 | up      |
| Dnajb6   | -1.30361205    | 0.030863508 | down    |
| Tenm3    | -1.805194805   | 0.035439403 | down    |
| Papss1   | -1.268933539   | 0.046499519 | down    |
| Fbln5    | -1.448979592   | 0.035439403 | down    |
| Fxr2     | 1.260559151    | 0.002742345 | down    |
| Ggt5     | 1.430120482    | 0.004387968 | up      |
| Dnajb6   | -1.30361205    | 0.030863508 | down    |
| Tenm3    | -1.805194805   | 0.035439403 | down    |
| Papss1   | -1.268933539   | 0.046499519 | down    |
| Fbln5    | -1.448979592   | 0.035439403 | down    |
| Fxr2     | 1.260559151    | 0.002742345 | down    |
| Ggt5     | 1.430120482    | 0.004387968 | up      |
| Dnajb6   | -1.30361205    | 0.030863508 | down    |
| Tenm3    | -1.805194805   | 0.035439403 | down    |
| Papss1   | -1.268933539   | 0.046499519 | down    |

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**Gene**
- **Log2FoldChange**
- **P.Value**
- **Status**
| Gene  | Log2FoldChange | p-value   | Direction |
|-------|----------------|-----------|-----------|
| Grb14 | 0.001603227    | 1.560271882 | up        |
| Ddah2 | -0.006244179   | -1.525444023 | down      |
| Srpx  | 0.037708412    | -2.740495868 | down      |
| Ech1  | 0.018762371    | 1.883687293  | up        |
| Mers1 | 0.025842837    | 1.261838893  | up        |
| Tubgcp4| 0.014882986   | -1.22306525  | down      |
| Rnf24 | 0.013670712    | -1.421052632 | down      |
| Reep1 | 0.047574647    | 1.228479853  | up        |
| Wwc2  | 0.013528782    | -1.320495646 | down      |
| Rcn3  | 0.03883724     | -1.871004712 | down      |
| Echdc2| 0.027075038    | 1.257905544  | up        |
| Carhsp1| 0.004351219   | -1.935558113 | down      |
| Acaa2 | 0.013601909    | 1.894330761  | up        |
| Nit2  | 0.014193937    | 1.407011543  | up        |
| Cd300lg| 0.020002323   | 1.76549232   | up        |
| Dbnadj2| 0.008013529   | -1.32145305  | down      |
| Mtg2  | 0.013603507    | 1.35742732   | up        |
| Rnasek| 0.029184975    | -1.205634522 | down      |
| Ppp1r3e| 0.01953106    | -1.702284022 | down      |
| Ybx2  | 0.037171       | 1.681422925  | up        |
| Map3k14| 0.002696444   | -1.756388416 | down      |
| Pkd2l2| 0.02228667    | 1.402390438  | up        |
| Clpp  | 0.02422334     | 1.270616048  | up        |
| Elov1l| 0.003543216    | -1.233127185 | down      |
| Skap2 | 0.04176706     | -1.298139535 | down      |
| Phe2  | 0.017952931    | -1.300991736 | down      |
| Irgm2 | 0.035818615    | 2.162589037  | up        |
| Atp8b2| 0.00671253     | -1.547747748 | down      |
| Bri3  | 0.00367423     | -1.318155692 | down      |
| Pdzrn3| 0.029785086    | -1.701705855 | down      |
| Camkk1| 0.033932341    | -2.348547718 | down      |
| Snx12 | 0.008746667    | -1.259496284 | down      |
| Akrl1 | 0.03606983     | 1.37715959   | up        |
| Dgke  | 0.028940732    | 1.39578714   | up        |
| Psmg1 | 0.000439531    | 1.328606249  | up        |
| Hey1  | 0.004227484    | -1.759272218 | down      |
| Patz1 | 0.013283874    | 1.347328244  | up        |
| Cited4| 0.030313131    | -1.496626768 | down      |
| Tmem45a| 0.009109842   | -1.659883721 | down      |
| Mrpl19| 0.012205937    | 1.31557585   | up        |
| Ptpn9 | 0.005717461    | -1.400873839 | down      |
| Mycbp | 0.036108128    | 1.242956458  | up        |
| Nuprl | 0.014070881    | -2.223542945 | down      |
| Dbnl  | 0.005254339    | -1.975360577 | down      |
| B4galt5| 0.000350623   | -1.880766501 | down      |
| ApiP  | 0.006308981    | 1.374119718  | up        |
| Ykt6  | 0.010630733    | -1.209578452 | down      |
| Mitic2| 0.03386294     | 1.203946655  | up        |
| Suclg1| 0.00592986     | 1.412861553  | up        |
| Gene    | Fold Change | log2 (Fold) Change | Status |
|---------|-------------|-------------------|--------|
| Dynll1  | 0.014348901 | -1.621379454      | down   |
| Habp4   | 0.003161575 | -1.201147567      | down   |
| Clec4n  | 0.048049576 | -1.648648649      | down   |
| Poll    | 0.030182756 | 1.228654971       | up     |
| Trim17  | 0.045734452 | -1.655940594      | down   |
| Plag1   | 0.035041858 | 1.710344828       | up     |
| Rabgef1 | 0.004715869 | -1.288637194      | down   |
| Litaf   | 0.003575887 | -1.534218289      | down   |
| Psrc1   | 0.019694368 | -2.764705882      | down   |
| Aldh9a1 | 0.014692499 | 1.702942017       | up     |
| Ltb4r2  | 0.00037968  | 1.602941176       | up     |
| As3mt   | 0.001355068 | 1.454730832       | up     |
| Gabarapl1 | 0.025407456  | -1.444903581      | down   |
| Ntn4    | 0.045943561 | 1.468275246       | up     |
| Tnip1   | 0.010884962 | -1.620767836      | down   |
| Cdc42se1 | 0.024376489  | 1.267014406       | down   |
| Mmp19   | 0.037446649 | -1.576177285      | down   |
| Drnaj4  | 0.003202647 | -1.386787538      | down   |
| Pvr1l   | 0.046911806 | 1.897435897       | down   |
| Stx6    | 0.001249672 | -1.498202732      | down   |
| Crbn    | 0.049752898 | 1.364464692       | up     |
| Hibadh  | 0.00512233  | 1.221429848       | up     |
| Dact1   | 0.021621764 | -1.405405405      | down   |
| Fetub   | 0.032144749 | -2.54166667       | down   |
| Fxyd6   | 0.028640368 | 1.437523594       | down   |
| Nek6    | 0.007843662 | -2.202409639      | down   |
| Iigpl   | 0.005360744 | 2.58168028        | up     |
| Actn4   | 0.014540818 | -1.390252017      | down   |
| Kcnq4   | 0.022383348 | 1.787810384       | up     |
| Dusp10  | 0.005481704 | 1.508124077       | up     |
| Cables1 | 0.02903196  | -1.434610304      | down   |
| Ctsz    | 0.008616462 | 1.40704698        | down   |
| Mltl    | 0.048707178 | 1.245598592       | down   |
| Osbpl1a | 0.005442204 | 1.205444549       | up     |
| Mrps14  | 0.048589251 | 1.337706904       | up     |
| Pmea1   | 0.014656999 | -1.733149171      | down   |
| Bean1   | 0.049243573 | -1.845771144      | down   |
| Zak     | 0.002505204 | 1.283044449       | up     |
| Ndufb5  | 0.013428988 | 1.342826763       | up     |
| Fopnl   | 0.037379276 | 1.200580341       | up     |
| Ndufa3  | 0.01624082  | 1.283188815       | up     |
| Ndufa9  | 0.037228349 | 1.302793737       | up     |
| Sf3b5   | 0.01406094  | -1.202344855      | down   |
| 1110008L16Rik | 0.004546811 | 1.431818182 | up     |
| Gene   | Log2 Fold Change | p-value | Change |
|--------|-----------------|---------|--------|
| Dnajc15 | 0.020768805     | 1.432791184 | up    |
| Prr13  | 0.001315117     | -1.257180402 | down  |
| Grina  | 0.008895808     | -1.225849169 | down  |
| Nudt14 | 0.018646221     | 1.566119901 | up    |
| Rpil3l | 0.045161811     | 2.071055901 | up    |
| Ndufb9 | 0.009304076     | 1.205241408 | up    |
| Mrps28 | 0.001418651     | 1.253660131 | up    |
| Osgep  | 0.01232994      | 1.355844431 | up    |
| Arfgap3| 0.022675934     | -1.633069083 | down  |
| Smim20 | 0.006022013     | 1.397986999 | up    |
| Smurf2 | 0.005702305     | -1.32523256  | down  |
| Atp5sl | 0.023432712     | 1.241526401 | up    |
| Tsfm   | 0.014362222     | 1.215326464 | up    |
| Alkbh7 | 0.029218057     | 1.370382751 | up    |
| Mrps15 | 0.036616046     | 1.238918476 | up    |
| Cyb5b  | 0.015537315     | 1.208137432 | up    |
| Prelid1| 0.027503226     | -1.207474677 | down |
| Cmss1  | 0.026022558     | 1.602799572 | up    |
| Dda1   | 0.001155619     | -1.322135417 | down |
| Tab1   | 0.00234695      | 1.501766784 | up    |
| Cul5   | 0.022155005     | -1.249524715 | down |
| Drap1  | 0.010285907     | -1.258068563 | down |
| Metap1d| 0.017577354     | 1.275405557 | up    |
| Snx9   | 0.03563342      | -1.205015045 | down |
| Ccnh   | 0.036041997     | 1.374624374 | up    |
| Uqcrf1 | 0.006270104     | 1.33236683  | up    |
| Spryd4 | 0.04289129      | 1.331673484 | up    |
| Dnase1l2| 0.015846203    | -1.674757282 | down |
| Ndufa3 | 0.031505614     | 1.250916627 | up    |
| Rsph3a | 0.000115681     | -1.689481066 | down |
| Etfdh  | 0.01143122      | 1.588355884 | up    |
| Tcf25  | 0.008299942     | -1.219635982 | down |
| Baiap2l1| 0.00155139     | -1.654558933 | down |
| Tmem107| 0.003950872     | -1.424920128 | down |
| Sdha   | 0.015166661     | 1.363172885 | up    |
| Smarcd3| 0.005485891     | -1.248420221 | down |
| Uqrc2  | 0.040188769     | 1.348554245 | up    |
| Oma1   | 0.005080718     | 1.424832496 | up    |
| Upf3a  | 0.006532391     | -1.396313364 | down |
| Mrpl45 | 0.002218078     | 1.478130733 | up    |
| Nop56  | 0.02459929      | 1.281818182 | up    |
| Lipt2  | 0.010944482     | 1.310454908 | up    |
| Lpar6  | 0.015653831     | 1.539325843 | up    |
| Dram2  | 0.049663156     | 1.594275254 | up    |
| Ubc2t  | 0.016281572     | 1.727129338 | up    |
| Plekho1| 0.048969699     | -1.675608369 | down |
| Tbc1d20| 0.001738991     | -1.219258177 | down |
| Ndufb8 | 0.023724771     | 1.266254769 | up    |
| Atpbp1 | 0.01709867      | 1.376762067 | up    |
| Gene       | Fold Change | Log2FC     | Status |
|------------|-------------|------------|--------|
| Mrpl46     | 0.032011127 | 1.43658827 | up     |
| Carnmt1    | 0.009897765 | 1.372352941| up     |
| Mfn1       | 0.011801607 | 1.210721724| up     |
| Eps8l1     | 0.043752356 | -1.664259928| down   |
| Adeck3     | 0.03440671  | 1.326518769 | up     |
| Mtpap      | 0.022729503 | 1.298959747 | up     |
| Decr1      | 0.005031022 | 1.64975485 | up     |
| Eepd1      | 0.024220685 | 1.659030837 | up     |
| Zfand4     | 0.031190211 | 1.68       | up     |
| Trim62     | 0.030788263 | -1.969026549| down   |
| Nutdt7     | 0.013175994 | 1.709123526| up     |
| Cog6       | 0.014739137 | 1.279380068| up     |
| Dusp6      | 0.031891416 | -1.481371088| down   |
| Bend5      | 0.032365141 | 1.351131222| up     |
| Ctdp1      | 0.008466665 | -1.229329173| down   |
| Sdhb       | 0.015717295 | 1.30936271 | up     |
| Mrpl18     | 0.026528966 | 1.281233561| up     |
| 18100371I17Rik | 0.049246945 | -1.320844546| down   |
| Bores3     | 0.001374021 | 1.394888179 | up     |
| Idh3a      | 0.003619577 | 1.2836653 | up     |
| Echdc3     | 0.01328649  | 1.35862826 | up     |
| Akr1b10    | 0.02113134  | 1.215727542| up     |
| Tmem86a    | 0.031344583 | 1.389100127| up     |
| Nudt12     | 0.003670781 | 1.382959641| up     |
| Ddx59      | 0.036764651 | 1.278877888| up     |
| Ftsj2      | 0.013900387 | 1.266248319| up     |
| Fam122a    | 0.022650522 | -1.25259284| down   |
| Chac2      | 0.020900977 | 1.31408661 | up     |
| 9430016H08Rik | 0.00425122 | 1.29255883 | up     |
| Fam212a    | 0.040013983 | 1.452879581| up     |
| Ndufb4     | 0.029084924 | 1.216479395| up     |
| Ndufb2     | 0.000703005 | 1.21161888 | up     |
| Efecab2    | 0.039518467 | 1.406626506| up     |
| Slec25a22  | 0.038843899 | 1.579757976| up     |
| Apoo       | 0.042336377 | 1.39834698 | up     |
| Crip2      | 0.028852841 | 1.355308896| up     |
| Ndufb10    | 0.000710527 | 1.262921156| up     |
| Ndufs3     | 0.020626496 | 1.33483424 | up     |
| Dusp23     | 0.031792262 | 1.537305699| up     |
| Card19     | 0.020882404 | -1.265988957| down   |
| Sgo1a      | 0.009861904 | 2.673469388| up     |
| Tefm       | 0.021931606 | 1.342307692| up     |
| Nufip2     | 0.016917617 | -1.3438949 | down   |
| Rtn4       | 0.019733445 | -1.35151512 | down   |
| Mtel1      | 0.033883977 | -1.475177305| down   |
| Nadk2      | 0.018979231 | 1.495500562| up     |
| Hmnpul2    | 0.015265649 | -1.324627339| down   |
| Arl8a      | 0.004612996 | -1.369590258| down   |
| Lrre16a    | 0.021345636 | -1.564220183| down   |
| Gene     | Log2FC | Fold Change | Status |
|----------|--------|-------------|--------|
| Phft2    | 0.0423 | 1.3339      | up     |
| Ms4a6d   | -0.0217| -0.7988     | down   |
| Pdgfrl   | 0.0022 | -2.5854     | down   |
| Sync     | 0.0068 | -1.3002     | down   |
| Foxk2    | 0.0012 | -1.2322     | down   |
| Rnf122   | 0.0013 | 1.6725      | up     |
| Klhdc9   | 0.0292 | 1.2442      | up     |
| 1110065P20Rik | 0.0428 | -1.4727     | down   |
| Cdan1    | 0.0372 | 1.2098      | up     |
| 1810013L24Rik | 0.0050 | 1.2577      | up     |
| Chac1    | 0.0157 | 2.3238      | up     |
| Ydjc     | 0.0479 | -2.2133     | down   |
| Khbd3    | 0.0497 | 1.4463      | up     |
| Rhebl1   | 0.0042 | 2.125       | up     |
| Mrpl44   | 0.0157 | 1.2668      | up     |
| Pms      | 0.0277 | -1.8732     | down   |
| Plekha4  | 0.0048 | -2.1660     | down   |
| Rfc3     | 0.0064 | 1.3661      | up     |
| Gins1    | 0.0478 | 1.9551      | up     |
| Dnajc17  | 0.0056 | 1.2764      | up     |
| Ndufa5   | 0.0263 | 1.2882      | up     |
| Antxr1   | 0.0126 | -1.6598     | down   |
| Mapklip1 | 0.0106 | 1.2252      | up     |
| Cmbl     | 0.0222 | 1.5232      | up     |
| Smco1    | 0.0006 | 1.8037      | up     |
| Rhou     | 0.0333 | -2.0396     | down   |
| Enho     | 0.0060 | -1.3014     | down   |
| Tmbim1   | 0.0279 | -1.3313     | down   |
| Aarsd1   | 0.0029 | 1.3548      | up     |
| Arap1    | 0.0064 | -1.2065     | down   |
| Rpain    | 0.0181 | 1.2696      | up     |
| Zswim7   | 0.0341 | 1.5130      | up     |
| Slc39a11 | 0.0365 | 1.2519      | up     |
| Mterf4   | 0.0063 | 1.3902      | up     |
| Mfsd11   | 0.0014 | -1.2433     | down   |
| Nabp2    | 0.0167 | -1.2063     | down   |
| Agk      | 0.0429 | 1.2259      | up     |
| Ptdc3    | 0.0234 | 1.4452      | up     |
| Chn2     | 0.0490 | -1.9534     | down   |
| Cmtm8    | 0.0094 | 2.0533      | up     |
| Ufsp1    | 0.0463 | 1.2008      | up     |
| Gcc2     | 0.0155 | 1.6347      | up     |
| Ndubab1  | 0.0082 | 1.4048      | up     |
| Asb12    | 0.0398 | 1.4037      | up     |
| Tmem70   | 0.0428 | 1.3339      | up     |
| Mpc2     | 0.0080 | 1.4916      | up     |
| Mipep    | 0.0342 | 1.2362      | up     |
| Zdhrc2   | 0.0058 | -1.8092     | down   |
| Slc25a33 | 0.0466 | 1.5840      | up     |
| Gene    | Log2 Fold Change | p-value  |
|---------|-----------------|----------|
| Pak4    | 0.000770912     | -1.391136802 | down |
| Fam175a | 0.01293403      | 1.305234534 | up    |
| Medag   | 0.00580399      | -2.48115942 | down  |
| Nos1ap  | 0.049334202     | -1.838187702 | down  |
| Ggmb1   | 0.023461485     | 1.374243258 | up    |
| Klhl30  | 0.000100473     | 1.316268844 | up    |
| Pgrmc2  | 0.007539127     | -1.411109012 | down  |
| Cnbd2   | 0.004746612     | 1.76872846  | up    |
| Atoh8   | 0.009617837     | -1.270845313 | down  |
| Oxsm    | 0.00345184      | 1.336799538 | up    |
| Dlg5    | 0.00209405      | -1.471228616 | down  |
| Nai1f   | 0.012822116     | -1.598253275 | down  |
| Rassf8  | 0.026928739     | -1.324106517 | down  |
| Pdss2   | 0.007953597     | 1.333333333 | up    |
| Sfpq    | 0.004313725     | -1.431578947 | down  |
| Cyp2u1  | 0.004845806     | 1.841680129 | up    |
| Atph5   | 0.002765468     | 1.216112682 | up    |
| Tmem25  | 0.021542585     | 1.203049203 | down  |
| Cdc40   | 0.007450651     | 1.378910776 | up    |
| Ap2b1   | 0.009272126     | 1.319354839 | up    |
| Pletk2f | 0.006317647     | 1.319354839 | up    |
| Nupl1   | 0.020556545     | -1.233927607 | down  |
| Gpr160  | 0.031504809     | 1.851851852 | up    |
| 231002L09Rik | 0.032891746 | 1.628303199 | up    |
| Mad212  | 0.016240749     | -1.25324419 | down  |
| Suds3   | 0.026058071     | -1.20100723 | down  |
| Ppp2r2a | 0.020715394     | 1.285129695 | up    |
| Sars2   | 0.013537747     | 1.312187812 | up    |
| Rpsud4  | 0.009220827     | 1.362995595 | up    |
| Cmn3    | 0.014697306     | -1.26793741 | down  |
| Slc25a35| 0.040331729     | -1.334724541 | down  |
| Tsc22d2 | 0.012011668     | -1.441416894 | down  |
| Mcccc1  | 0.005355334     | 1.262476713 | up    |
| Cyp4f18 | 0.025475019     | 2.238410596 | up    |
| Mfsd8   | 0.038729311     | 1.312150838 | up    |
| Fbx120  | 0.006602095     | 1.295469049 | up    |
| 1810041L15Rik | 0.046779776 | -2.194029851 | down  |
| Amer1   | 0.01821544      | 1.443181818 | up    |
| Ze2hc1c | 0.044307156     | 1.39207692 | up    |
| Rbm12b1 | 0.02361085      | -1.347663551 | down  |
| Lrprc   | 0.046875683     | 1.563857515 | up    |
| Ttc30b  | 0.00888001      | 1.702325581 | up    |
| Hsd12  | 0.006910978     | 1.423770657 | up    |
| Tspany4 | 0.0466184       | 1.208160443 | up    |
| Reep4   | 0.02381751      | -1.372124493 | down  |
| Ppme1   | 0.00937076      | -1.27346217 | down  |
| Zfp655  | 0.036112875     | 1.215865751 | up    |
| 2700097O09Rik | 0.029288048 | 1.733791749 | up    |
| Skida1  | 0.040198387     | 1.516528926 | up    |
| Gene       | Log2FoldChange | p-value  | cancer_type | valueline | status  |
|------------|----------------|----------|-------------|-----------|---------|
| Zkscan3    | 0.00664699     | 1.294440631 | up          |           |         |
| Tmem135    | 0.00617502     | 1.458632532 | up          |           |         |
| Ttc19      | 0.039962843    | 1.36394674 | up          |           |         |
| Zfp839     | 0.030998562    | 1.242673993 | up          |           |         |
| Ndufv2     | 0.014279733    | 1.39485964 | up          |           |         |
| Gpr22      | 0.008168239    | 6.580925181 | up          |           |         |
| SLC25A42   | 0.035080535    | 1.69797924 | up          |           |         |
| Cenpv      | 0.02266375     | 1.42408587 | up          |           |         |
| Itpr1l1    | 0.02959693     | 1.32422907 | up          |           |         |
| Hbp1       | 0.039746436    | 1.3151758  | up          |           |         |
| Zfp763     | 0.00919302     | 2.3333333  | up          |           |         |
| Tubb2b     | 0.027038888    | 1.98222222 | down        |           |         |
| Mcee       | 0.001139031    | 1.37847769 | up          |           |         |
| SLC25A27   | 0.011670783    | 1.3883721  | up          |           |         |
| Traf3ip1   | 0.028654172    | 1.22127139 | down        |           |         |
| Arpp21     | 0.026705191    | 2.9178082  | up          |           |         |
| Pi16       | 0.015029124    | -2.5519066 | down        |           |         |
| Opa1       | 0.035949249    | 1.23979825 | up          |           |         |
| Ehhadh     | 0.01804626     | 1.57108816 | up          |           |         |
| Jod1       | 0.020993962    | -1.2669579 | down        |           |         |
| Gpcpd1     | 0.047221991    | 1.67159065 | up          |           |         |
| Xpo6       | 0.032996083    | 1.25812547 | up          |           |         |
| 1700017B05Rik | 0.002991269   | -1.368758  | down        |           |         |
| Mterf2     | 0.03517385     | 1.52108843 | up          |           |         |
| Chpf       | 0.003608751    | -1.4635711 | down        |           |         |
| Gale       | 0.04515907     | -1.551181  | down        |           |         |
| Hopx       | 0.007387712    | 1.53329824 | up          |           |         |
| Wdr33      | 0.037226117    | 1.25773577 | up          |           |         |
| Cltb       | 0.003570446    | -1.4802000 | down        |           |         |
| Lonrf3     | 0.042365477    | -2.826923  | down        |           |         |
| Sgms2      | 0.044362613    | -1.9538461 | down        |           |         |
| Lrcc15     | 0.026125547    | 2.67957746 | up          |           |         |
| Kbtd13     | 0.025750959    | 2.1920903  | up          |           |         |
| Scpepl1    | 0.022524561    | -1.5258493 | down        |           |         |
| Ddit4      | 0.019813615    | -1.8160373 | down        |           |         |
| Mxra8      | 0.006182154    | -1.803597  | down        |           |         |
| Lmbr11     | 0.048455103    | -1.2611275 | down        |           |         |
| Ppa2       | 0.032744651    | 1.37645052 | up          |           |         |
| Tmem65     | 0.04385315     | 1.43062544 | up          |           |         |
| Purg       | 0.005564089    | -1.3728813 | down        |           |         |
| Cep128     | 0.00778155     | 2.28333333 | up          |           |         |
| Dusp18     | 0.023865572    | 1.53145998 | up          |           |         |
| Sirt4      | 0.031877899    | 1.26994984 | up          |           |         |
| Secisbp2   | 0.020013015    | 1.36159461 | up          |           |         |
| Lym7       | 0.048653735    | 1.27063701 | up          |           |         |
| Rshp9      | 0.007424218    | -2.0837988 | down        |           |         |
| Prr29      | 0.02365339     | 2.15652173 | up          |           |         |
| Yipf7      | 0.00818645     | 1.64065420 | up          |           |         |
| Gene     | Log2FoldChange | Log10Pvalue | Status |
|----------|----------------|-------------|--------|
| Malsu1   | 0.013390035    | 1.350103093 | up     |
| Nr2c2ap  | 0.018803143    | -1.338028169| down   |
| Cul5     | 0.026296265    | 1.437956204 | up     |
| Kli124   | 0.006922758    | 1.40028169  | up     |
| Rapgef2  | 0.028163758    | 1.360503645 | up     |
| Adhfe1   | 0.014353048    | 1.663123222 | up     |
| Rtf1     | 0.004850043    | 1.231224397 | up     |
| 0610040J01Rik | 0.023662349 | 2.615212528 | up     |
| Tax1bp3  | 0.045185652    | -1.256200625| down   |
| Mfap4    | 0.009278485    | -4.05910683 | down   |
| Asb5     | 0.048517382    | 1.837784372 | up     |
| Mtf3     | 0.045847012    | 1.248271889 | up     |
| Mrsb2    | 0.010989525    | 1.239585492 | up     |
| Peolce2  | 0.001309634    | -1.806595864| down   |
| Fa2      | 0.017387797    | -1.259962049| down   |
| Srxn1    | 0.037193826    | -1.321381837| down   |
| Clip3    | 0.018458495    | -1.48694517 | down   |
| Ckm      | 0.037558552    | 1.384858044 | up     |
| Dcun1d5  | 0.033127406    | 1.263077594 | up     |
| Ifi27l2a | 0.036643683    | -1.738677094| down   |
| Ndufa6   | 0.032785685    | 1.27343911  | up     |
| Ddrk1    | 0.004476872    | -1.217711706| down   |
| Ston1    | 0.036453424    | -1.442151805| down   |
| Tmem181a | 0.000242669    | 1.632247143 | up     |
| Crebrf   | 0.044041374    | 1.410649819 | up     |
| Shisa4   | 0.004435897    | -2.058031088| down   |
| Agl      | 0.003079183    | 1.231258967 | up     |
| Bel9     | 0.04312435     | 1.386378962 | up     |
| Myh10    | 0.008918518    | -1.366799205| down   |
| Apex2    | 0.005510835    | 2.083098592 | up     |
| Zfp955a  | 0.04878316     | 1.498322148 | up     |
| Ypel2    | 0.007982643    | -1.606604451| down   |
| Mcc2     | 0.0002497059   | 1.553359684 | up     |
| Cpt1c    | 0.038961556    | -1.47826087 | down   |
| Ndufv3   | 0.014198589    | 1.34849235  | up     |
| Cdk19    | 0.006994411    | 1.34533333  | up     |
| Ddx52    | 0.04760126     | 1.374774775 | up     |
| Ash8     | 0.02308799     | 1.267898782 | up     |
| Nol3     | 0.036949086    | -1.27102921 | down   |
| Filip11  | 0.007308292    | -1.350819672| down   |
| Galnt15  | 0.000359249    | 1.710776942 | up     |
| Clip4    | 0.002094152    | -1.345034642| down   |
| Ttc30a1  | 0.002983153    | 1.619377163 | up     |
| Zfp623   | 0.009625461    | -1.382940109| down   |
| Trmt44   | 0.045207032    | -1.470119522| down   |
| Crisploid2 | 0.00054257 | -2.054478301 | down   |
| Gas2L1   | 0.040794661    | -1.54856941 | down   |
| Saal1    | 0.03582354     | -1.37973273 | down   |
| Gene      | Log2 Fold | P-value   | 
|-----------|-----------|-----------|
| Tnfrsf22  | 0.023625942 | 1.468062827 | up |
| BC004004  | 0.005316385 | 1.216476944 | up |
| Fam20c    | 5.22222E-05 | -1.353652128 | down |
| Ghdc      | 0.015582623 | -1.433651344 | down |
| Ifitm2     | 0.021220464 | -1.473604177 | down |
| Lrba      | 0.011563582 | 1.254794148 | up |
| Slec16a3  | 0.001741418 | -1.69451074 | down |
| Fcrls     | 0.008191433 | -1.705801105 | down |
| Fgf16     | 0.001741418 | -1.69451074 | down |
| Lrba      | 0.018299595 | 1.367015099 | up |
| Vmn1r65   | 0.029080437 | 3.2 | up |
| Vmn1r58   | 0.026568817 | 1.360033031 | up |
| Jdp2      | 0.031159625 | -1.728976697 | down |
| Caeng7    | 0.012483145 | -1.394195889 | down |
| Glis2     | 0.012587702 | -1.407666521 | down |
| Nde1l     | 4.5731E-05 | -1.407666521 | down |
| Trem2     | 0.02829006 | -2.053884712 | down |
| Mov10l1   | 0.007479842 | 1.612073293 | up |
| Fstl3     | 0.001117302 | -2.802298851 | down |
| Smarcd1   | 0.005355573 | 1.317927171 | up |
| Trim8     | 0.025082357 | -1.23237998 | down |
| Pcedha11  | 0.039267996 | -1.921708185 | down |
| Mpvl17l   | 0.029072166 | 1.552356021 | up |
| Echsl     | 0.03343466 | 1.247324946 | up |
| Pcdhhb17  | 0.030341053 | -1.304849885 | down |
| Pcdhhb22  | 0.032075961 | -1.776119403 | down |
| Mrpl34    | 0.010868843 | 1.292201853 | up |
| Trim7     | 0.007530233 | 2.73198594 | up |
| Tnfrsf21  | 0.048467378 | 1.424266455 | up |
| Zfp423    | 0.036335287 | -1.468879668 | down |
| C77080    | 0.049739331 | -1.595854922 | down |
| Strm4     | 0.010024647 | -1.23812132 | down |
| Sh3bp4    | 0.017054938 | -1.39442623 | down |
| Lpcat4    | 0.034676271 | -1.573949904 | down |
| Stard7    | 0.02143415 | 1.30965502 | up |
| Golga2    | 0.041143569 | -1.247159091 | down |
| Olfrm13   | 0.001165918 | -1.839375 | down |
| Ldrlap1   | 0.014638527 | -1.284131206 | down |
| Gpr153    | 0.001515565 | -2.17494812 | down |
| Emilin1   | 0.010423304 | -1.56162855 | down |
| Zfp956    | 0.032345238 | 1.356468777 | up |
| Pwwp2b    | 0.04933863 | -1.443734015 | down |
| Iglr1     | 0.025132529 | 1.324369748 | up |
| Smim19    | 0.008822209 | 1.20747519 | up |
| Acad11    | 0.012092985 | 1.259630093 | up |
| Fbxw11    | 0.025240502 | -1.22181862 | down |
| Adcy3     | 0.016993599 | -1.375308642 | down |
| E2f4      | 0.006576447 | -1.201584669 | down |
| Aldh6a1   | 0.0073847 | 1.391931034 | up |
| Gene | log2FoldChange | adjPvalue |
|------|----------------|-----------|
| Adi1 | 0.03889008 | 1.288248337 | up |
| Rfc4 | 0.047013606 | 1.417601381 | up |
| Pkdc | 0.02438182 | -1.606666667 | down |
| Ppces | 0.017756564 | 1.226571767 | up |
| AI413582 | 0.024642112 | -1.695884774 | down |
| Ticam1 | 0.017760413 | -1.345289079 | down |
| Tnfaip8 | 0.009706399 | 2.685765443 | up |
| Mrp14 | 0.044259293 | 1.205174687 | up |
| Jmd6 | 0.036614304 | -1.235342153 | down |
| Cth | 0.033244753 | 2.986013986 | up |
| Slco3a1 | 0.030730966 | -1.561674628 | down |
| Fam210a | 0.025162242 | -1.269789227 | down |
| Mtrf1l | 0.000299163 | 1.641447368 | up |
| Prkcdbp | 0.019120019 | -1.425440613 | down |
| Mmaa | 0.03854239 | 1.287096013 | up |
| Mlcc | 0.032853462 | -1.29839374 | down |
| Rarrres1 | 0.032751804 | 1.679775281 | up |
| Lrce39 | 0.024893351 | 1.496974063 | up |
| Cyb5r3 | 0.001919183 | -1.398320011 | down |
| Asl | 0.013316967 | -1.308605341 | down |
| Tmbim6 | 0.025027647 | 1.28166937 | up |
| Triobp | 0.005828067 | -1.251524777 | down |
| Pde4c | 0.028200092 | 1.834042553 | up |
| Qdpr | 0.02771968 | 1.221013926 | up |
| Acat1 | 0.017580952 | 1.425112844 | up |
| Pecca | 0.002894786 | 1.48520638 | up |
| Ettb | 0.011509399 | 1.578137951 | up |
| Lims1 | 0.043255275 | 1.323100246 | up |
| Ettf | 0.009522501 | 1.659766703 | up |
| Egln1 | 0.049389015 | 1.203952588 | up |
| Impa2 | 0.019685504 | 1.864344638 | up |
| Asb7 | 0.048434299 | 1.2448 | up |
| Helb | 0.015414182 | 1.316596932 | up |
| Klf16 | 0.021515219 | -1.362732314 | down |
| Atp6v0a4 | 0.028677315 | -6.155555556 | down |
| P2ry14 | 0.007172945 | 1.871143376 | up |
| Asbl4 | 0.000458089 | 1.410253887 | up |
| Kirrel | 0.001764136 | -1.487283825 | down |
| Idh3b | 0.039764757 | 1.357193603 | up |
| Rtn4p1 | 0.040573237 | 1.285012566 | up |
| Tram2 | 0.004446758 | -1.66487214 | down |
| Inpp5j | 0.009998697 | -1.403210237 | down |
| Il17rc | 0.011777223 | -1.342504744 | down |
| Gene  | Fold Change | p-value | Expression |
|-------|-------------|---------|------------|
| Ntng2 | 0.007366601 | -1.853641457 | down |
| Acot2 | 0.042495866 | 2.039424404 | up |
| Crelld1 | 0.001642318 | -1.216664285 | down |
| Bmf   | 0.003459091 | 1.610778443 | up |
| Mical1 | 0.028958742 | -1.229012346 | down |
| Mvd   | 0.040904378 | 1.289473684 | up |
| Sardh | 0.003215425 | -1.536585366 | down |
| Fam195b | 0.012255592 | -1.322460292 | down |
| Tmlhe | 0.012490124 | 1.348655681 | up |
| Lrrc75a | 0.028958742 | -1.229012346 | down |
| Mvd   | 0.040904378 | 1.289473684 | up |
| Sardh | 0.003215425 | -1.536585366 | down |
| Fam195b | 0.012255592 | -1.322460292 | down |
| Tmlhe | 0.012490124 | 1.348655681 | up |
| Lrrc75a | 0.028958742 | -1.229012346 | down |
| Mvd   | 0.040904378 | 1.289473684 | up |
| Sardh | 0.003215425 | -1.536585366 | down |
| Fam195b | 0.012255592 | -1.322460292 | down |
| Tmlhe | 0.012490124 | 1.348655681 | up |
| Lrrc75a | 0.028958742 | -1.229012346 | down |
| Mvd   | 0.040904378 | 1.289473684 | up |
| Gene   | Symbol | Fold Change | p-value | Status |
|--------|--------|-------------|---------|--------|
| Adamts2| 0.020276197 | -2.000628931 | down    |
| Mrpl22 | 0.008297293 | 1.405585106 | up      |
| Arhgap44| 0.020001078 | -1.352919971 | down    |
| Nlgn2  | 0.002588226 | -1.733766234 | down    |
| Kctd11 | 0.003694033 | -1.926509186 | down    |
| Neurl4 | 0.049044183 | 1.20548806   | up      |
| Arrb2  | 0.015844072 | -1.42605505  | down    |
| Samd14 | 0.038841515 | -1.532646048 | down    |
| Plekhh3 | 0.01825363  | 1.338582677  | up      |
| Fam171a2| 0.046209749 | 1.20548806   | up      |
| Arhgap44| 0.021460927 | 1.239430352  | up      |
| Pqlc3  | 0.006196113 | -2.023929471 | down    |
| Trim47  | 0.009867851 | 1.338582677  | up      |
| Bcl17643| 0.006574239 | -1.361097257 | down    |
| Pqle3  | 0.006196113 | -2.023929471 | down    |
| Ankny2 | 0.021460927 | 1.239430352  | up      |
| Ctage5 | 0.009867851 | 1.276540284  | up      |
| L2hdh | 0.037020337 | 1.277425204  | up      |
| Coq6   | 0.042278964 | 1.24557976   | up      |
| Pomi2  | 0.019676689 | -1.285035629 | down    |
| Nrde2  | 0.011665597 | 1.386690647  | up      |
| Rcor1  | 0.037734989 | -1.200448766 | down    |
| Cep170b| 0.010846231 | -1.379069767 | down    |
| Larp4b | 0.028125825 | 1.20096678   | up      |
| Lhfp2  | 0.008072681 | -2.102362205 | down    |
| Pde8b  | 0.024351518 | 1.710884354  | up      |
| Haus4  | 0.010450019 | 1.383193277  | up      |
| Itgb1  | 0.021562124 | -3.086251067 | down    |
| Zc3h3  | 0.040115992 | -1.223942208 | down    |
| Tmem184b| 0.037987519 | -1.251945989 | down    |
| Meat   | 0.029994544 | 1.330306088  | up      |
| Rnd1   | 0.027457829 | -2.370535714 | down    |
| Scarf2 | 0.003170872 | -1.624356775 | down    |
| Cyyr1  | 0.018271516 | 1.927781013  | up      |
| Setd4  | 0.035053442 | 1.720930233  | up      |
| Adamts10| 0.011183229 | -1.578216374 | down    |
| Lclat1 | 0.039447132 | 1.819113127  | up      |
| Ttc7   | 0.02057385  | 1.3010279    | up      |
| Rsl24d1| 0.020744035 | 1.294916807  | up      |
| Pik3c3 | 0.015462158 | 1.230832988  | up      |
| Ammecr1| 0.033850199 | -1.221585482 | down    |
| Snx32  | 0.03158817  | -1.37398374  | down    |
| Ndufs8 | 0.016211167 | 1.25541472   | up      |
| Erinl1 | 0.009726759 | -1.33901193  | down    |
| Pprcl  | 0.019997096 | -1.35023989  | down    |
| Lame1  | 0.027313597 | -1.295422606 | down    |
| Rasa12 | 0.006406462 | 1.318489835  | up      |
| Lyplal1| 0.039507236 | 1.662698413  | up      |
| Gene   | Code  | Adjusted | Fold Change | Sign  |
|--------|-------|----------|-------------|-------|
| Actr1b | 0.0407 | 1.2630  | -            | down  |
| Ndufs1 | 0.0278 | 1.3301  | 1            | up    |
| Ppip5k2| 0.0119 | 1.9370  | 1            | up    |
| Qsox2  | 0.0036 | 1.6789  | 1            | up    |
| Ddx31  | 0.0380 | -1.3013 | 1            | down  |
| Slc25a25| 0.0374 | -1.3876 | 1            | down  |
| Fam129b| 0.0392 | -1.4861 | 1            | down  |
| Atp5g3 | 0.0158 | 1.3393  | 1            | up    |
| Zdhhc5 | 0.0079 | -1.2651 | 1            | down  |
| Mall   | 0.0061 | -1.6916 | 1            | down  |
| Btbh3  | 0.0109 | 1.2971  | 1            | up    |
| Mylk2  | 0.0448 | -3.4324 | 1            | down  |
| Dlgap4 | 0.0168 | -1.2451 | 1            | down  |
| Ppp1r3d| 0.0019 | 1.5     | 1            | up    |
| Ciart  | 0.0255 | 3.0878  | 1            | up    |
| Ccbl2  | 1.4929 | 1.5291  | 1            | up    |
| Cebp3  | 0.0256 | 1.6507  | 1            | up    |
| Fam214b| 0.0043 | -1.226  | 1            | down  |
| Atpaf1 | 0.0370 | 1.2704  | 1            | up    |
| Tmem69 | 0.0013 | 1.3325  | 1            | up    |
| Asap3  | 0.0469 | 1.5110  | 1            | up    |
| Cep104 | 0.0439 | -1.2441 | 1            | down  |
| Klh117 | 0.0069 | 1.2646  | 1            | up    |
| Nupl2  | 0.0098 | 1.4288  | 1            | up    |
| Hadhb  | 0.0319 | 1.5596  | 1            | up    |
| Tada2b | 0.0278 | -1.2108 | 1            | down  |
| Polr2b | 0.0321 | 1.2144  | 1            | up    |
| Ssh1   | 0.0324 | -1.3527 | 1            | down  |
| Radil  | 0.0254 | -1.4880 | 1            | down  |
| Gpce5a | 0.0045 | -2.5540 | 1            | down  |
| Mrps35 | 0.0393 | 1.3272  | 1            | up    |
| Ccdc136| 0.0036 | -2.7314 | 1            | down  |
| Zc3hc1 | 0.0003 | 1.2178  | 1            | up    |
| Zfp628 | 0.0246 | -1.2031 | 1            | down  |
| Arhgap35| 0.0366 | -1.2393 | 1            | down  |
| Zfp428 | 0.0313 | 1.5595  | 1            | up    |
| Itpkc  | 0.0324 | -1.2789 | 1            | down  |
| Samd4b | 0.0499 | -1.4369 | 1            | down  |
| Kctd15 | 0.0053 | -2.1523 | 1            | down  |
| Al1897944| 0.0432 | 1.4216  | 1            | up    |
| Lrk1   | 0.0189 | -1.4842 | 1            | down  |
| Picalm | 0.0322 | -1.3770 | 1            | down  |
| P2ry6  | 0.0178 | -1.3588 | 1            | down  |
| Fbxl19 | 0.0123 | -1.5502 | 1            | down  |
| Fus    | 0.0042 | 1.3784  | 1            | up    |
| Cnpe2  | 0.0247 | -1.3219 | 1            | down  |
| Zfp612 | 0.0058 | 1.7412  | 1            | up    |
| Gene     | Start   | End       | Expression Value | Summary |
|----------|---------|-----------|------------------|---------|
| Piezo1   | 234839  | 234982    | 0.012310866      | down   |
| Gramd1b  | 235283  | 235435    | 0.049379033      | up     |
| Fam214a  | 235493  | 235645    | 0.004115162      | up     |
| Plxb1    | 235611  | 235763    | 0.009220011      | up     |
| Stard8   | 236920  | 237072    | 0.011211754      | down   |
| Sh3r3    | 237353  | 237505    | 0.023026834      | down   |
| Lingo3   | 237403  | 237555    | 0.000176339      | up     |
| Btnl9    | 237754  | 237906    | 0.039414476      | up     |
| Zfp867   | 237775  | 237927    | 0.025809667      | up     |
| Cdr2l    | 237988  | 238140    | 0.007856829      | up     |
| Akap5    | 238276  | 238428    | 0.032243196      | up     |
| Ogdhl    | 239017  | 239169    | 0.036162327      | up     |
| Mk12     | 239719  | 240001    | 0.009186194      | up     |
| Zfp799   | 240064  | 240216    | 0.017944253      | down   |
| Cehcr1   | 240084  | 240236    | 0.000176339      | up     |
| Slec3g1  | 240660  | 240812    | 0.025809667      | up     |
| Pik3c2b  | 240752  | 240904    | 0.009186194      | up     |
| 2900026A02Rik | 243219 | 243370 | 0.039777183 | down |
| Lrrc61   | 243382  | 243534    | 0.025809667      | up     |
| Mcph1    | 244329  | 244481    | 0.035498862      | up     |
| Zfp791   | 244556  | 244708    | 0.025809667      | up     |
| Layn     | 244864  | 245016    | 0.01765367       | up     |
| Dclk3    | 245038  | 245190    | 0.025809667      | down   |
| AA414768 | 245350  | 245502    | 0.025809667      | down   |
| Dcaf121l| 245404  | 245556    | 0.025809667      | up     |
| Zfp277   | 246196  | 246348    | 0.025809667      | up     |
| Vwa1     | 246228  | 246380    | 0.025809667      | down   |
| Dnajc28  | 246738  | 246890    | 0.025809667      | up     |
| Prrt1    | 260297  | 260449    | 0.025809667      | down   |
| Plekhg3  | 263406  | 263558    | 0.025809667      | up     |
| Scml4    | 268297  | 268449    | 0.025809667      | up     |
| Sh3pxd2b | 268396  | 268548    | 0.025809667      | up     |
| Ankrd13b | 268445  | 268597    | 0.025809667      | down   |
| Arhgef40 | 268739  | 268891    | 0.025809667      | down   |
| Dagla    | 269060  | 269212    | 0.025809667      | down   |
| Ss18l1   | 269397  | 269549    | 0.025809667      | down   |
| Abhd18   | 269492  | 269644    | 0.025809667      | down   |
| Luzp1    | 269593  | 269745    | 0.025809667      | down   |
| Clip2    | 269713  | 269865    | 0.025809667      | down   |
| Orai2    | 269717  | 269869    | 0.025809667      | down   |
| Chsyl    | 269941  | 270093    | 0.025809667      | down   |
| Gcdh     | 270076  | 270228    | 0.025809667      | down   |
| Clpx     | 270166  | 270318    | 0.025809667      | down   |
| Rab6b    | 270192  | 270344    | 0.025809667      | down   |
| Gene   | Description | Expression 1 | Expression 2 | Change | Status   |
|--------|-------------|--------------|--------------|--------|----------|
| Tbck   | Tbc1K          | 0.028361109  | 1.205761317  | up     |
| Arntl2 | Arnt-like 2   | 0.008497396  | 2.295180723  | up     |
| Tarsl2 | Tars1-like 2  | 0.031120824  | 1.282557454  | up     |
| Klhl23 | Klhl-like 23  | 0.009633685  | 1.524066577  | up     |
| Fam131c| Fam13-like 1c | 0.041054786  | -1.985074627 | down   |
| Arntl2 | Arnt-like 2   | 0.008497396  | 2.295180723  | up     |
| Tarsl2 | Tars1-like 2  | 0.031120824  | 1.282557454  | up     |
| Klhl23 | Klhl-like 23  | 0.009633685  | 1.524066577  | up     |
| Fam131c| Fam13-like 1c | 0.041054786  | -1.985074627 | down   |
| Arntl2 | Arnt-like 2   | 0.008497396  | 2.295180723  | up     |
| Tarsl2 | Tars1-like 2  | 0.031120824  | 1.282557454  | up     |
| Klhl23 | Klhl-like 23  | 0.009633685  | 1.524066577  | up     |
| Fam131c| Fam13-like 1c | 0.041054786  | -1.985074627 | down   |

**Note:** The above table lists selected gene expressions and their corresponding changes. The status column indicates whether the expression is upregulated (up) or downregulated (down).
| ID    | Gene   | Log2 Fold Change | p-value     | Status  |
|-------|--------|-----------------|-------------|---------|
| 382056 | Crtc1  | 0.036800783     | -1.395765472 | down   |
| 382137 | Fdxacb1| 0.028800947     | 1.543887147 | up      |
| 382562 | Pfni4  | 0.003074119     | 1.496845426 | up      |
| 384009 | Glipr2 | 0.030909602     | -1.419191919 | down   |
| 407785 | Ndufs6 | 0.02920988      | 1.481863084 | up      |
| 407800 | Ecm2   | 0.016965892     | -1.218093093 | down   |
| 432442 | Akap7  | 0.044990883     | 1.330927052 | up      |
| 432779 | Lrrec14b| 0.000210974    | 1.489182692 | up      |
| 433375 | Creg1  | 0.01018121      | 1.359361593 | up      |
| 433771 | Minos1 | 0.041685532     | 1.288964466 | up      |
| 434179 | Akap7  | 0.044990883     | 1.330927052 | up      |
| 434215 | Lrrc32 | 0.002041131     | -1.672738312 | down   |
| 434233 | Gm5601 | 0.013169267     | -1.474293497 | down   |
| 434437 | Amt    | 0.011102394     | 1.223013049 | up      |
| 435766 | Tnni3k | 0.031681562     | 1.258080077 | up      |
| 436022 | Dnaaf3 | 0.004646372     | 2.120521173 | up      |
| 504186 | Chrna10| 0.041840007     | 1.497175141 | up      |
| 545276 | Gal3st3| 0.021425326     | 2.201654602 | up      |
| 546611 | Klhl33 | 0.045048362     | 2.20970266  | up      |
| 595136 | Ndufs5 | 0.024913206     | 1.26889403  | up      |
| 622675 | Zfp827 | 0.031353777     | 1.35087143  | up      |
| 623661 | Lipt1  | 0.020396814     | 1.453081232 | up      |
| 625360 | BC147527| 0.023487245   | 3.333333333 | up      |
| 628308 | Gm14420| 0.044904688     | 1.402714067 | up      |
| 629059 | Fam124a| 0.003382346     | -1.484808544 | down   |
| 629378 | Dact3  | 0.003996641     | -1.598143852 | down   |
| 630751 | LOC630751| 0.008367188 | 42.05882353  | up      |
| 633640 | Gm7120 | 0.004338625     | 2.069613644 | up      |
| 641340 | Nrbf2  | 0.003160394     | 1.397323726 | up      |
| 654801 | Zfp784 | 0.018023591     | 1.239929947 | up      |
| 666642 | Gm8210 | 0.023383042     | 2.692874693 | up      |
| 666907 | Ms44a4 | 0.032254858     | -1.645283019 | down   |
| 673094 | Cd99   | 0.017638639     | -1.442165914 | down   |
| 100041085 | Mfsd4b3| 0.015260856     | 1.529767911 | up      |
| 100041194 | Ahnak2 | 0.018851231     | -2.347268881 | down   |
| 100041677 | Gm13157| 0.040118137     | 1.539473684 | up      |
| 100169864 | Gm44504| 0.022735031     | -3.90625   | down   |
| 100862085 | Gm16867| 0.024942       | -3.782680966 | down   |
| 100862375 | Gm21685| 0.018866117     | -2.10135705 | down   |
| 101056102 | Gm29779| 0.015967549     | -1.751992914 | down   |
| 101056408 | Gm15816| 0.039794625     | -1.565181518 | down   |
| 102635879 | LOC102635879| 0.035460271 | -3.975   | down   |
| 102638515 | LOC102638515| 0.007374279 | -2.06042685 | down   |
| 105242736 | LOC105242736| 0.008429726 | 4.384615385 | up      |
| 105242869 | Gm38958| 0.035787655     | -2.355263158 | down   |
| 105245547 | Gm40991| 0.02718331     | 2.465838509 | up      |
| 105246811 | Gm42035| 0.014170732     | -1.270011274 | down   |
| 105247050 | Gm42226| 0.001624631     | -2.914563107 | down   |
| ID          | Value1  | Value2      | Action |
|-------------|---------|-------------|--------|
| 108167440   | 0.026550431 | 2.835497835 | up     |
| 108167858   | 0.002867162 | -1.675866496 | down   |
| 108167951   | 0.047102088 | -2.559055118 | down   |
| 108168101   | 0.036412801 | 1.560627675 | up     |
| 108168376   | 0.004654861 | -1.694834617 | down   |
| 108168747   | 0.038418542 | 1.38079096  | up     |
| 108169043   | 0.004009376 | 1.349820949 | up     |
| 108169061   | 0.032539356 | 2.00174216  | up     |
| 108169093   | 0.000631354 | 2.688663283 | up     |