# **RESEARCH ARTICLE**

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# Messenger RNA profile analysis deciphers new Esrrb responsive genes in prostate cancer cells

Yuan Lu<sup>1,2,5</sup>, Jilong Li<sup>2,3,4</sup>, Jianlin Cheng<sup>2,3,4</sup> and Dennis B. Lubahn<sup>1,2\*</sup>

# Abstract

**Background:** Orphan nuclear receptor estrogen related receptor  $\beta$  (Esrrb or ERR $\beta$ ) is well known in stem cells and early embryonic development. However, little is known about its function in cancer.

**Method:** We investigated the mRNA profile alterations induced by Esrrb expression and its synthetic ligand DY131 in human prostate cancer DU145 cells via RNA-Seq analysis.

**Results:** We distinguished 67 mRNAs differentially expressed by Esrrb alone. Although DY131 alone did not change any gene, treatment of DY131 in the presence of Esrrb altered 1161 mRNAs. These observations indicated Esrrb had both ligand-independent and ligand-dependent activity. When Esrrb was expressed, DY131 treatment further regulated 15 Esrrb-altered mRNAs. DY131 acted as an antagonist for 11 of 15 mRNAs (*wdr52, f13a1, pxdn, spns2, loc100506599, tagln, loc441454, tkel1, sema3f, zcwpw2, sdc2*) and as an agonist for 4 of the 15 mRNAs (*rarres3, oasl, padi2, ddx60*). Gene ontology analyses showed altered genes are related to transcription and translation regulation, cell proliferation and apoptosis regulation, and cellular metabolism.

**Conclusion:** Our results characterized mRNA profiles in DU145 prostate cancer cells driven by Esrrb expression and Esrrb ligand DY131, and provided multiple markers to characterize Esrrb's function in Esrrb research.

**Keywords:** Estrogen related receptor, RNA-Seq, Prostate cancer, Gene expression profile, DY131, Transcription regulation, Nuclear receptor

# Background

Esrrb encodes nuclear receptor estrogen related receptor  $\beta$  (Esrrb), which belongs to the nuclear receptor family. Esrrb acts as a transcription factor by binding to a specific DNA sequence estrogen related receptor response element (ERRE), which is also known as steroid factor response element (SFRE), or half site estrogen response element [1, 2].

Esrrb, first cloned in 1988, was not intensively studied until recent years. Knocking out of Esrrb was embryonic lethal due to placental malformation [3]. Though early studies showed a very limited range of tissues with positive Esrrb expression, recent studies reported that short

\*Correspondence: lubahnd@missouri.edu

<sup>1</sup> Department of Biochemistry, University of Missouri, Columbia, MO 65211, USA form Esrrb alternative splicing isoform had a broad range of expression [4]. Esrrb was found to be a core-reprogramming factor to reprogram Pluripotent Stem Cells (iPSCs) [3–6]. *c-myc* and *klf4* of the OSKM (*oct4*, *sox2*, *klf4*, *c-myc*) core-reprogramming factors can be replaced by Esrrb [5, 6]. Esrrb was also recently reported to drive *sox2* transcription and induce iPSC in a single cell system [7].

Tumorigenesis and tumor progression are related to Esrrb. Esrrb was shown to be down-regulated in prostate cancer epithelium compared to normal prostate tissue [8–10]. Its re-expression in DU145 and LNCaP cells was shown to stimulate tumor suppressor *cdkn1a* (p21) concentration. Also, Esrrb can inhibit Estrogen Receptor transcriptional activity in uterine endometrial cancer cells and Nrf2-Keap signaling pathway in breast cancer cells [11, 12].

There are a handful of transcriptome-wide expression survey data from Esrrb knockdown in both human



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iPSCs and mouse embryonic stem cells [13–16]. Known Esrrb controlled genes include *klf4, c-myc, cdkn1a* and *cyp19a1,* but Esrrb target genes in cancer cells are still not known.

This manuscript focuses on the discovery of Esrrb ligand-independent and Esrrb ligand-dependent target genes. We performed RNA-Seq analysis to characterize Esrrb regulated mRNAs in a prostate cancer cell line and we found the treatment of DY131 expanded Esrrb's transcriptional regulation activity to many more genes.

### Results

## Establishment of the Esrrb stably transfected DU145 cells

Esrrb expression vector or control pcDNA3.1 (Zeo+) vector were transfected into DU145 cells. After 3 weeks of Zeocine selection, we characterized the Esrrb status by reverse transcriptase (RT)-PCR, qPCR and western blot analysis (Fig. 1a-c). Our results showed that Esrrb was successfully expressed in DU145-Esrrb cells. Although RNA-Seq showed that DU145-pc3.1 cells had a very small amount of Esrrb expressed (count per



Esrrb cells, while Esrrg is not expressed in either DU145-pc3.1 and DU145-Esrrb cells

million read <1), the Esrrb concentration is below the detection limit of RT-PCR and western blot. Compared to HEK293 cells, which expressed endogenous Esrrb, overexpression of Esrrb in DU145 cells raised the Esrrb protein concentration to a comparable physiological concentration (Fig. 1b). In addition, our RT-PCR results and RNA-seq results confirmed the estrogen related receptor gamma (Esrrg) was not expressed in DU145 cells. The absence of Esrrg eliminated any possible functional contamination by Esrrg in our Esrrb studies (Fig. 1c).

## Esrrb expression alters mRNA profile

To distinguish genes regulated by Esrrb, we performed RNA-Seq analysis on cDNA libraries constructed from two biological replicates of both DU145-pc3.1 and DU145-Esrrb cells. Spearman ranking correlation analysis showed that the expression of Esrrb in DU145 created a distinct transcriptome compared to control DU145pc3.1 cells (Fig. 2a). We found 67 genes (21 genes upregulated, 46 genes down-regulated) altered due to Esrrb expression (Fig. 2b; Table 1). Seven genes that are among the most changed genes (zcwpw2, hoxb8, tagln, f13a1, *pxdn*, *aox1*, and *bmp4*, as well as  $tgf\beta$  as a negative control) were confirmed by qPCR (Fig. 3). Gene ontology (GO) analysis shows that the products of Esrrb driven differentially expressed genes fell into functional categories of regulation of cell development as well as immune responses (Table 2).

#### DY131 requires Esrrb to affect gene expression

To get a more comprehensive understanding of Esrrbregulated genes and characterize Esrrb's potential ligand dependent activity, control DU145-pc3.1 and DU145-Esrrb cells were treated with Esrrb/Esrrg synthetic ligand DY131. Since both qPCR and RNA-seq show Esrrb transcript concentration is extremely low in DU145 cells and Esrrg is absent, and Esrrb protein concentration is also below the detection limit of western-blot analysis, it was not surprising to observe DY131 treatment without Esrrb expressed did not result in any gene differentially expressed (Fig. 4a). After we applied DY131 to DU145-Esrrb cells, we found DY131 treatment most significantly modified the transcriptome (Figs. 2a, 4b). Further comparison of DU145-Esrrb cells alone to DY131-treated DU145-Esrrb cells detected 1161 altered mRNAs (861 down-regulated, 300 up-regulated). 15 of them overlapped with Esrrb-induced mRNA alterations (Fig. 4c, d; Table 3). We defined an Esrrb agonist as a ligand that moves the mRNA concentration in the direction as Esrrb does; and an antagonist moves the concentration in the opposite direction as Esrrb does. By comparing the trend of the altered genes induced by Esrrb expression and



DY131 treatment, DY131 acts as an agonist for 4 of the 15 genes, and an antagonist for 11 of the 15 genes (Fig. 4d). There are another 1146 mRNAs changed with both Esrrb and DY131 treatment compared to Esrrb alone, indicating their responses is ligand-dependent (Table 3).

GO analysis showed Esrrb-dependent DY131 up-regulated genes were important for regulation of transcription, regulation of apoptosis and proliferation, and a

#### Table 1 Esrrb altered mRNAs

ACX1         -3.49         4.89E-184         3.19E-180           PXDN         -2.79         4.45E-87         1.16E-83           F13A1         -2.68         9.28E-114         4.04E-110           BMP4         -2.59         1.69E-29         1.16E-26           NPTX1         -2.11         1.06E-46         1.73E-43           SPNS2         -1.70         8.70E-31         7.09E-28           DX60         -1.61         2.43E-15         4.46E-13           NEFL         -1.61         1.84E-13         2.85E-11           OASL         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00012978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.33         1.09E-19         2.91E-17           PCDHB15         -1.41         7.82E-06         0.00011537           G8P1         -1.31         1.43E-07         7.57E-06           IGFB93         -1.	Gene symbol	logFC	P value	FDR
PXDN         -2.79         4.45E-87         1.16E-83           F13A1         -2.68         9.28E-114         4.04E-110           BMP4         -2.59         1.69E-29         1.16E-26           NPTX1         -2.11         1.06E-46         1.73E-43           SPNS2         -1.70         8.70E-31         7.09E-28           DDX60         -1.61         2.43E-13         2.85E-11           OASL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.0001537           C3         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-17         2.57E-06           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFB93         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29	AOX1	-3.49	4.89E-184	3.19E-180
F13A1       -2.68       9.28E-114       4.04E-110         BMP4       -2.59       1.69E-29       1.16E-26         NPTX1       -2.11       1.06E-46       1.73E-43         SPNS2       -1.70       8.70E-31       7.09E-28         DX60       -1.61       2.43E-15       4.46E-13         NEFL       -1.61       1.84E-13       2.85E-11         OASL       -1.60       1.30E-25       7.07E-23         IFIT3       -1.60       4.29E-42       5.09E-39         WDR52       -1.50       1.85E-06       7.40E-05         C3       -1.43       7.81E-09       5.73E-07         LOC344887       -1.41       5.01E-20       1.49E-17         PCDHB15       -1.41       6.25E-06       0.000120978         CXGrf57       -1.41       1.78E-10       1.92E-06         IGFB93       -1.31       3.19E-89       1.04E-85         ZSCAN12P1       -1.30       0.00015585       0.0302695         RNF128       -1.29       1.58E-10       1.73E-08         SAMD9       -1.28       8.28E-07       3.62E-05         MX2       -1.27       1.68E-06       6.86E-05         SSBP2       -1.26 <t< td=""><td>PXDN</td><td>-2.79</td><td>4.45E-87</td><td>1.16E-83</td></t<>	PXDN	-2.79	4.45E-87	1.16E-83
BMP4         -2.59         1.69E-29         1.16E-26           NPTX1         -2.11         1.06E-46         1.73E-43           SPNS2         -1.70         8.70E-31         7.09E-28           DDX60         -1.61         2.43E-15         4.46E-13           NEFL         -1.60         1.30E-25         7.07E-23           IFI3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00012078           CXGR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.28         8.28E-07         3.62E-05           MX2         -1.26         5.96E-05         0.00141054           MX1	F13A1	-2.68	9.28E-114	4.04E-110
NPTX1         -2.11         1.06E-46         1.73E-43           SPNS2         -1.70         8.70E-31         7.09E-28           DDX60         -1.61         2.43E-15         4.46E-13           NEFL         -1.61         1.84E-13         2.85E-11           OASL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         1.78E-10         1.92E-08           L76         -1.33         1.09E-19         2.91E-17           CXGR4         -1.32         3.23E-06         0.0011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.13         3.19E-89         1.04E-85           SAMD9         -1.29         1.58E-10         1.73E-08           NK128         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25	BMP4	-2.59	1.69E-29	1.16E-26
SPNS2         -1.70         8.70E-31         7.09E-28           DDX60         -1.61         2.43E-15         4.46E-13           NEFL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.0001537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.33         3.19E-89         1.04E-85           SAMD9         -1.29         1.58E-10         1.73E-08           NK128         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25 </td <td>NPTX1</td> <td>-2.11</td> <td>1.06E-46</td> <td>1.73E-43</td>	NPTX1	-2.11	1.06E-46	1.73E-43
DDX60         -1.61         2.43E-15         4.46E-13           NEFL         -1.61         1.84E-13         2.85E-11           OASL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.0002078           CXorf57         -1.41         1.78E-10         1.92E-08           CXGR4         -1.32         3.23E-06         0.0011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.28         8.28E-07         3.62E-05           SUT4A1         -1.20         4.94E-05         0.0014054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1	SPNS2	-1.70	8.70E-31	7.09E-28
NEFL         -1.61         1.84E-13         2.85E-11           OASL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.0002078           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         2.69E-22         1.13E-19           UNCSA         -1.28         5.29E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULTAA1         -1.20         4.94E-05         0.00120711           DYD	DDX60	-1.61	2.43E-15	4.46E-13
OASL         -1.60         1.30E-25         7.07E-23           IFIT3         -1.60         4.29E-42         5.09E-39           WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXorf57         -1.41         1.78E-06         0.0011537           GBP1         -1.31         3.13E-07         7.57E-06           IGFBP3         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNC5A         -1.28         8.28E-07         3.62E-05           MX1         -1.25         5.99E-22         2.37E-19           SUT4A1         -1.20         4.94E-05         0.00120711           DYD         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.99E-22         2.37E-19           SUT4A1         -1.	NEFL	-1.61	1.84E-13	2.85E-11
IFIT3       -1.60       4.29E-42       5.09E-39         WDR52       -1.50       1.85E-06       7.40E-05         C3       -1.43       7.81E-09       5.73E-07         LOC344887       -1.41       5.01E-20       1.49E-17         PCDHB15       -1.41       6.25E-06       0.00020978         CXorf57       -1.41       1.78E-10       1.92E-08         IFI6       -1.38       1.09E-19       2.91E-17         CXCR4       -1.32       3.23E-06       0.00011537         GBP1       -1.31       1.43E-07       7.57E-06         IGFBP3       -1.31       3.19E-89       1.04E-85         SAMD9       -1.29       2.69E-22       1.13E-08         SAMD9       -1.28       8.28E-07       3.62E-05         MX2       -1.27       1.68E-06       6.86E-05         SSBP2       -1.26       5.96E-05       0.00141054         MX1       -1.25       5.99E-22       2.37E-19         SULT4A1       -1.20       4.94E-05       0.0002370         NEBL       -1.18       5.48E-30       3.97E-27         NA       -1.17       2.47E-05       0.0006379         BMF       -1.18       5.48E-3	OASL	-1.60	1.30E-25	7.07E-23
WDR52         -1.50         1.85E-06         7.40E-05           C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.68E-05           SULT4A1         -1.20         4.94E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00142071           DYD         -1.18         1.16E-12         1.62E-101           TAGLN	IFIT3	-1.60	4.29E-42	5.09E-39
C3         -1.43         7.81E-09         5.73E-07           LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNCSA         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.88E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DYD         -1.19         1.35E-05         0.0006739           BMF	WDR52	-1.50	1.85E-06	7.40E-05
LOC344887         -1.41         5.01E-20         1.49E-17           PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNCSA         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         5.48E-30         3.97E-27           INA	C3	-1.43	7.81E-09	5.73E-07
PCDHB15         -1.41         6.25E-06         0.00020978           CXorf57         -1.41         1.78E-10         1.92E-08           IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         2.69E-22         1.13E-19           UNCSA         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00040614           IFT2	LOC344887	-1.41	5.01E-20	1.49E-17
CXorf57       -1.41       1.78E-10       1.92E-08         IFI6       -1.38       1.09E-19       2.91E-17         CXCR4       -1.32       3.23E-06       0.00011537         GBP1       -1.31       1.43E-07       7.57E-06         IGFBP3       -1.31       3.19E-89       1.04E-85         ZSCAN12P1       -1.30       0.00015585       0.00302695         RNF128       -1.29       1.58E-10       1.73E-08         SAMD9       -1.29       2.69E-22       1.13E-19         UNC5A       -1.28       8.28E-07       3.62E-05         MX2       -1.27       1.68E-06       6.86E-05         SSBP2       -1.26       5.99E-22       2.37E-19         SULT4A1       -1.20       4.94E-05       0.00120711         DYD       -1.18       1.16E-12       1.62E-10         TAGLN       -1.18       5.48E-30       3.97E-27         INA       -1.17       2.47E-05       0.0006739         BMF       -1.16       3.32E-05       0.0004057         IFIT2       -1.11       1.02E-19       2.76E-17         LOC1005065       -1.10       8.53E-05       0.0018618         RARRES3       -1.07	PCDHB15	-1.41	6.25E-06	0.00020978
IFI6         -1.38         1.09E-19         2.91E-17           CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         2.69E-22         1.13E-19           UNC5A         -1.28         8.28E-07         3.62E-05           MX2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.0008559           ESRP1         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0016245           LGALS3BP         -1.05         4.57E-17         9.68E-06           TMEM45A	CXorf57	-1.41	1.78E-10	1.92E-08
CXCR4         -1.32         3.23E-06         0.00011537           GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNC5A         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00140257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00040257           ISA3         -1.12         1.38E-05         0.0014064           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0016245           IGALS3BP	IFI6	-1.38	1.09E-19	2.91E-17
GBP1         -1.31         1.43E-07         7.57E-06           IGFBP3         -1.31         3.19E-89         1.04E-85           ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNC5A         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.00085559           ESRP1         -1.16         3.32E-05         0.00040614           IFT2         -1	CXCR4	-1.32	3.23E-06	0.00011537
IGFBP3       -1.31       3.19E-89       1.04E-85         ZSCAN12P1       -1.30       0.00015585       0.00302695         RNF128       -1.29       1.58E-10       1.73E-08         SAMD9       -1.29       2.69E-22       1.13E-19         UNC5A       -1.28       8.28E-07       3.62E-05         MX2       -1.27       1.68E-06       6.86E-05         SSBP2       -1.26       5.96E-05       0.00141054         MX1       -1.25       5.99E-22       2.37E-19         SULT4A1       -1.20       4.94E-05       0.00120711         DPYD       -1.19       1.35E-05       0.00040257         NEBL       -1.18       1.16E-12       1.62E-10         TAGLN       -1.18       5.48E-30       3.97E-27         INA       -1.17       2.47E-05       0.0006739         BMF       -1.16       3.32E-05       0.00085559         ESRP1       -1.11       1.02E-19       2.76E-17         LOC1005065       -1.10       8.53E-05       0.018618         RARES3       -1.07       1.84E-07       9.68E-06         TMEM45A       -1.06       4.69E-06       0.00016245         LGALS3BP       -1.05 <td>GBP1</td> <td>-1.31</td> <td>1.43E-07</td> <td>7.57E-06</td>	GBP1	-1.31	1.43E-07	7.57E-06
ZSCAN12P1         -1.30         0.00015585         0.00302695           RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNC5A         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.0016245           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT1	IGFBP3	-1.31	3.19E-89	1.04E-85
RNF128         -1.29         1.58E-10         1.73E-08           SAMD9         -1.29         2.69E-22         1.13E-19           UNC5A         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2	ZSCAN12P1	-1.30	0.00015585	0.00302695
SAMD9       -1.29       2.69E-22       1.13E-19         UNC5A       -1.28       8.28E-07       3.62E-05         MX2       -1.27       1.68E-06       6.86E-05         SSBP2       -1.26       5.96E-05       0.00141054         MX1       -1.25       5.99E-22       2.37E-19         SULT4A1       -1.20       4.94E-05       0.00120711         DPYD       -1.19       1.35E-05       0.00040257         NEBL       -1.18       1.16E-12       1.62E-10         TAGLN       -1.18       5.48E-30       3.97E-27         INA       -1.17       2.47E-05       0.0006739         BMF       -1.16       3.32E-05       0.00085559         ESRP1       -1.13       0.0014206       0.02283503         GJA3       -1.12       1.38E-05       0.00040614         IFT2       -1.11       1.02E-19       2.76E-17         LOC1005065       -1.10       8.53E-05       0.0018618         RARRES3       -1.05       4.57E-17       9.63E-15         LGALS3BP       -1.05       1.83E-50       3.41E-47         WNT10A       -1.05       0.0024417       0.0044189         PADI2       -1.04	RNF128	-1.29	1.58E-10	1.73E-08
UNC5A         -1.28         8.28E-07         3.62E-05           MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARES3         -1.05         4.57E-17         9.63E-165           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.0024704         0.00440189           PAD12	SAMD9	-1.29	2.69E-22	1.13E-19
MX2         -1.27         1.68E-06         6.86E-05           SSBP2         -1.26         5.96E-05         0.00141054           MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0008559           BMF         -1.16         3.32E-05         0.0008559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.05         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2	UNC5A	-1.28	8.28E-07	3.62E-05
SSBP2       -1.26       5.96E-05       0.00141054         MX1       -1.25       5.99E-22       2.37E-19         SULT4A1       -1.20       4.94E-05       0.00120711         DPYD       -1.19       1.35E-05       0.00040257         NEBL       -1.18       1.16E-12       1.62E-10         TAGLN       -1.18       5.48E-30       3.97E-27         INA       -1.17       2.47E-05       0.0006739         BMF       -1.16       3.32E-05       0.00085559         ESRP1       -1.13       0.00014206       0.00283503         GJA3       -1.12       1.38E-05       0.00040614         IFT2       -1.11       1.02E-19       2.76E-17         LOC1005065       -1.10       8.53E-05       0.0018618         RARRES3       -1.07       1.84E-07       9.68E-06         TMEM45A       -1.06       4.69E-06       0.00016245         LGALS3BP       -1.05       1.83E-50       3.41E-47         WNT10A       -1.05       0.00024417       0.00440189         PADI2       -1.04       1.13E-17       2.55E-15         REEP1       -1.01       0.00024704       0.004413         AMIGO2       -1	MX2	-1.27	1.68E-06	6.86E-05
MX1         -1.25         5.99E-22         2.37E-19           SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.01         0.00024704         0.004413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1 </td <td>SSBP2</td> <td>-1.26</td> <td>5.96E-05</td> <td>0.00141054</td>	SSBP2	-1.26	5.96E-05	0.00141054
SULT4A1         -1.20         4.94E-05         0.00120711           DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.01         0.00024704         0.0044413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD	MX1	-1.25	5.99E-22	2.37E-19
DPYD         -1.19         1.35E-05         0.00040257           NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         4.57E-17         9.63E-15           ERAP2         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.01         0.00024704         0.004413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B <td>SULT4A1</td> <td>-1.20</td> <td>4.94E-05</td> <td>0.00120711</td>	SULT4A1	-1.20	4.94E-05	0.00120711
NEBL         -1.18         1.16E-12         1.62E-10           TAGLN         -1.18         5.48E-30         3.97E-27           INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFIT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.04         1.13E-17         2.55E-15           REEP1         -1.01         0.00024704         0.0044413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRI	DPYD	-1.19	1.35E-05	0.00040257
TAGLN-1.185.48E-303.97E-27INA-1.172.47E-050.0006739BMF-1.163.32E-050.0008559ESRP1-1.130.000142060.00283503GJA3-1.121.38E-050.00040614IFIT2-1.111.02E-192.76E-17LOC1005065-1.108.53E-050.0018618RARRES3-1.071.84E-079.68E-06TMEM45A-1.064.69E-060.00016245LGALS3BP-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	NEBL	-1.18	1.16E-12	1.62E-10
INA         -1.17         2.47E-05         0.0006739           BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFIT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         4.57E-17         9.63E-15           ERAP2         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.01         0.00024704         0.004413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRIP3         0.97         4.28E-14         6.90E-12           HOXB8         0.98         3.60E-11         4.33E-09           KCNQ5	TAGLN	-1.18	5.48E-30	3.97E-27
BMF         -1.16         3.32E-05         0.00085559           ESRP1         -1.13         0.00014206         0.00283503           GJA3         -1.12         1.38E-05         0.00040614           IFIT2         -1.11         1.02E-19         2.76E-17           LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         4.57E-17         9.63E-15           ERAP2         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.01         0.00024704         0.004413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRIP3         0.97         4.28E-14         6.90E-12           HOXB8         0.98         3.60E-11         4.33E-09           KCNQ5         0.98         5.87E-08         3.55E-06	INA	-1.17	2.47E-05	0.0006739
ESRP1-1.130.000142060.00283503GJA3-1.121.38E-050.00040614IFIT2-1.111.02E-192.76E-17LOC1005065-1.108.53E-050.0018618RARRES3-1.071.84E-079.68E-06TMEM45A-1.064.69E-060.00016245LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	BMF	-1.16	3.32E-05	0.00085559
GJA3-1.121.38E-050.00040614IFIT2-1.111.02E-192.76E-17LOC1005065-1.108.53E-050.0018618RARRES3-1.071.84E-079.68E-06TMEM45A-1.064.69E-060.00016245LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	ESRP1	-1.13	0.00014206	0.00283503
IFIT2-1.111.02E-192.76E-17LOC1005065-1.108.53E-050.0018618RARRES3-1.071.84E-079.68E-06TMEM45A-1.064.69E-060.00016245LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	GJA3	-1.12	1.38E-05	0.00040614
LOC1005065         -1.10         8.53E-05         0.0018618           RARRES3         -1.07         1.84E-07         9.68E-06           TMEM45A         -1.06         4.69E-06         0.00016245           LGALS3BP         -1.05         4.57E-17         9.63E-15           ERAP2         -1.05         1.83E-50         3.41E-47           WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.04         1.13E-17         2.55E-15           REEP1         -1.01         0.00024704         0.004413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRIP3         0.97         4.28E-14         6.90E-12           HOXB8         0.98         3.60E-11         4.33E-09           KCNQ5         0.98         5.87E-08         3.55E-06	IFIT2	-1.11	1.02E-19	2.76E-17
RARRES3-1.071.84E-079.68E-06TMEM45A-1.064.69E-060.00016245LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044113AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	LOC1005065	-1.10	8.53E-05	0.0018618
TMEM45A-1.064.69E-060.00016245LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	RARRES3	-1.07	1.84E-07	9.68E-06
LGALS3BP-1.054.57E-179.63E-15ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	TMEM45A	-1.06	4.69E-06	0.00016245
ERAP2-1.051.83E-503.41E-47WNT10A-1.050.000244170.00440189PADI2-1.041.13E-172.55E-15REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	LGALS3BP	-1.05	4.57E-17	9.63E-15
WNT10A         -1.05         0.00024417         0.00440189           PADI2         -1.04         1.13E-17         2.55E-15           REEP1         -1.01         0.00024704         0.0044113           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRIP3         0.97         4.28E-14         6.90E-12           HOXB8         0.98         3.60E-11         4.33E-09           KCNQ5         0.98         5.87E-08         3.55E-06	ERAP2	-1.05	1.83E-50	3.41E-47
PADI2         -1.04         1.13E-17         2.55E-15           REEP1         -1.01         0.00024704         0.0044413           AMIGO2         -1.01         8.26E-45         1.08E-41           HES1         -0.98         1.30E-07         7.01E-06           FRMD4B         -0.98         0.00014442         0.00284746           NRIP3         0.97         4.28E-14         6.90E-12           HOXB8         0.98         3.60E-11         4.33E-09           KCNQ5         0.98         5.87E-08         3.55E-06	WNT10A	-1.05	0.00024417	0.00440189
REEP1-1.010.000247040.0044413AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	PADI2	-1.04	1.13E-17	2.55E-15
AMIGO2-1.018.26E-451.08E-41HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	REEP1	-1.01	0.00024704	0.0044413
HES1-0.981.30E-077.01E-06FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	AMIGO2	-1.01	8.26E-45	1.08E-41
FRMD4B-0.980.000144420.00284746NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	HES1	-0.98	1.30E-07	7.01E-06
NRIP30.974.28E-146.90E-12HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	FRMD4B	-0.98	0.00014442	0.00284746
HOXB80.983.60E-114.33E-09KCNQ50.985.87E-083.55E-06	NRIP3	0.97	4.28E-14	6.90E-12
KCNQ5 0.98 5.87E-08 3.55E-06	HOXB8	0.98	3.60E-11	4.33E-09
	KCNQ5	0.98	5.87E-08	3.55E-06

## Table 1 continued

Gene symbol	logFC	P value	FDR
COX6B2	0.99	1.24E-07	6.77E-06
PPFIBP2	1.04	6.38E-07	2.92E-05
KIAA1199	1.06	1.21E-25	6.89E-23
BST1	1.08	4.97E-13	7.30E-11
LOC1001336	1.13	0.00019921	0.00370382
SMOC1	1.15	1.52E-06	6.32E-05
LOC441454	1.15	9.40E-06	0.00029713
DDIT4L	1.18	2.28E-10	2.39E-08
SEMA3F	1.27	2.08E-20	6.96E-18
DUOX1	1.35	5.37E-09	4.25E-07
ARHGAP24	1.39	6.40E-10	6.01E-08
CDHR1	1.44	2.04E-06	7.93E-05
SDC2	1.44	1.49E-08	1.04E-06
SH3RF3	1.44	1.32E-05	0.00039562
PRSS8	1.45	6.96E-06	0.00022989
TKTL1	1.90	3.68E-21	1.33E-18
FGB	1.96	5.57E-22	2.27E-19
ZCWPW2	5.22	3.47E-215	4.53E-211

majority of down-regulated genes are related to oxidation and reduction, metabolism and translation elongation (Table 4; Additional file 1: Table S1).

## Discussion

Esrrb has gained lots of attention in recent years because of its biological function in stem cells and its ability to reprogram somatic cells to iPSC with *oct4* and *sox2* [6, 13, 17–21]. Several other functions of Esrrb have also been discovered including alteration of energy balance, estrogen receptor and glucocorticoid receptor transcription function modulation, Keap1-Nrf2 signaling inhibition, and tumorigenesis in prostate cancer and endometrial adenocarcinoma [9–12, 22–25]. But transcriptome-wide Esrrb function and Esrrb-regulated genes in cancer cells are not well studied.

Esrrb was reported by Chan et al. as a tumor suppressor in DU145 and LNCaP prostate cancer cells using both in vitro and in vivo models [9]. Expression of Esrrb induced p21/cdkn1a by directly binding to an ERRE in p21/cdkn1a's promoter, arrested cell cycle at S-phase, and significantly inhibited cell growth [9, 26]. Interestingly, we did not find p21/cdkn1a up-regulation after Esrrb expression alone, but after we treated DU145 cells with 3  $\mu$ M DY131, we observed a significant increase of p21/cdkn1a mRNA (Table 3; Additional file 2: Figure S1). Scrutinizing the data revealed that Chan's lab cultured their cells with full serum, while we used charcoal-stripped serum for cell culture and DY131 treatment [9].



statistical analysis (\*p < 0.05). Seven genes were differentially expressed in both RNA-seq and qPCR, 1 gene, TGFbeta, is not differentially expressed in either assay and serves as a negative control. *Right panel* RNA-Seq analysis result, fold change (FC) indicates the ratio of normalized read counts in DU145-Esrrb to that of DU145-pc3.1

This implies that there is a compound or factor that can be removed by charcoal treatment modulated Esrrb's activity [27, 28].

From the Esrrb-regulated gene list, we found a few target genes that are related to the known function of Esrrb. *Kiaa1199* encoded gene product has been shown to associate with cellular mortality. A *kiaa1199* mutation was reported to relate to nonsyndromic hearing loss. Considering the significant effect of Esrrb mutations on human hearing loss, *kiaa1199* could be a mediator of Esrrb mutant related hearing loss [29–32] [33–36]. Another interesting Esrrb responsive gene is *tagln* (Transgelin). It was inhibited by Esrrb while DY131 treatment relieved the inhibition. *Tagln* was reported to promote DU145 cell migration and invasion, indicating Esrrb can also affect DU145 cell behavior by affecting *tagln* [37].

Judging by the numbers of altered genes induced by Esrrb with or without DY131, and the result that DY131 did not alter any mRNA in the absence of Esrrb, we conclude that DY131 activity is Esrrb-dependent.

Table 2 Gene ontology analysis of Esrrb altered mRNAs

Term	Count	P value
GO:0060284 ~ regulation of cell development	5	0.006
GO:0006955 ~ immune response	8	0.012
GO:0009611 ~ response to wounding	7	0.012
GO:0042542 ~ response to hydrogen peroxide	3	0.017
GO:0050767 ~ regulation of neurogenesis	4	0.022
GO:0006800 ~ oxygen and reactive oxygen species metabolic process	3	0.024
GO:0060052 ~ neurofilament cytoskeleton organiza- tion	2	0.029
GO:0000302 ~ response to reactive oxygen species	3	0.03
GO:0051960 ~ regulation of nervous system develop- ment	4	0.032
GO:0031960 ~ response to corticosteroid stimulus	3	0.038
GO:0010035 ~ response to inorganic substance	4	0.038
GO:0045661 ~ regulation of myoblast differentiation	2	0.039
GO:0048667 ~ cell morphogenesis involved in neuron differentiation	4	0.04

## Conclusions

In conclusion, we characterized the transcriptome alteration induced by Esrrb expression as well as Esrrb with its ligand DY131 in prostate cancer cells. We conclude Esrrb-target synthetic ligand requires Esrrb to generate its gene expression modulation effect. Finally, analysis of Esrrb target genes indicates Esrrb may be an important factor in regulating cell proliferation.

## Methods

#### Cell culture and reagents

DU145 (ATCC Number: HTB-81) and HEK293 (ATCC number: CRL-1571) cells were obtained from the American Type Culture Collection (ATCC). DU145 cells were cultured in RPMI1640 media (Invitrogen, Grand Island, NY, USA) with 10 % Fetal Bovine Serum (FBS) (GE Healthcare Life Sciences, Logan, UT, USA). HEK293 cells were cultured in Eagle's Minimal Essential Medium (DMEM) (Invitrogen, Grand Island, NY, USA) with 10 % FBS. 70 % confluent DU145 cells were transfected with either pcDNA3.1-zeo (+)-Esrrb expression vector [4], or control empty vector pcDNA3.1-zeo (+) (Promega, Madison, WI, USA). Empty vector or Esrrb expression vector transfected DU145 cells were maintained in medium containing 150 µg/ml Zeocine (Invitrogen, Grand Island, NY, USA) for 3 weeks for selection. Two biological replicates of DU145 cells transfected with Esrrb were pooled together respectively and were named DU145-Esrrb. Two biological replicates of DU145 cells transfected with control vector were pooled together respectively and were named DU145-pc3.1. Total RNA and protein were collected from cells after they are confluent in 60 mm petri dishes, cultured with phenol-red free RPMI1640 with 10 % Charcoal-stripped FBS [38]. For DY131 (Tocris Bioscience, Bristol, UK) treatment, cells are plated in 60 mm petri dishes until confluent; DU145-pc3.1 and DU145-Esrrb are incubated with 3  $\mu$ M DY131 diluted in medium with charcoal-stripped FBS for indicated length of time.

#### Western-blot

Total protein was isolated from DU145-pc3.1, and DU145-Esrrb cells. 20 µg protein was loaded on 9 % SDS gels. After the proteins were transferred to nitrocellulose membrane, the membrane was blocked and then incubated with 1:2000 diluted monoclonal anti-Esrrb mouse IgG (R&D system, Cat. no: PP-H6705-00) and 1:2000 diluted polyclonal anti-GPADH rabbit IgG (Santa Cruz, Dallas, TX, USA, Cat. no: sc-25777) at 4 degrees overnight. The membrane was then washed and incubated with anti-mouse or anti-rabbit secondary antibody. Chemoluminescence (Promega, Madison, WI, USA) signals were collected using x-ray films (Fisher Scientific, Pittsburg, PA, USA).

## **Reverse transcriptase PCR and quantitative PCR**

Total RNA was isolated and purified from DU145-pc3.1 and DU145-Esrrb using RNeasy kit (Qiagen, Venlo, Netherlands). 1000 ng of total RNA was used to create cDNA libraries using Superscript III Reverse Transciptase with random primers and oligodT (Invitrogen, Grand Island, NY, USA). Esrrb mRNA concentration was determined using quantitative PCR (qPCR) (iQ SYBR, BioRad, Hercules, CA, USA) on ABI7500 system (Applied Biosystems, Foster City, CA, USA). PCR condition: 95°, 30 s; 60°, 40 s; 72°, 40 s. Each qPCR test was performed three times on each of the two biological replicates. Primer sequences: zcwpw2 (Genbank: NM 001040432): forward primer: AACAGGGTTGTCTGTGAGACGGA; reverse primer: TGCAGGAGCTTCTGGGCTGC. hoxb8 (Genbank: NM\_024016): forward primer: GATGCGCC CGCAAGCAGC; reverse primer: CCCAGGGCGT GCGATACCTC. tagln (Genbank: NM\_001001522): forward primer: ATGCCCCGGATGACTTGGCT; reverse primer: GCCATGTCTGGGGGAAAGCTCCT. f13a1 (Genbank: NM\_000129): forward primer: TGTTCCGT GAAATCCGGCCC; reverse primer: TGCACGTCC AG CTCGCCATA. pxdn (Genbank: NM\_012293): forward primer: GCAAGCATTTAA GGGACTTGCCT CT; reverse primer: GCAAAAATAGCCTCTCGAGCTT CGG. aox1 (Genbank: NM\_001159): forward primer: TACGTGAACGGCCGCAAGGT; reverse primer: TGGCTGGGTGATGCCTTATCCT. bmp4 (Genbank: NM\_001202): forward primer: CCACCACGAAGAA CA TCTGGAG; reverse primer: GCCCCTTTCCCAAT CAGGGC. *tgfβ*: (Genbank: NM\_000660) forward



primer: AGTGGACATC AACGGGTTCAC; reverse primer: CGCACGCAGCAGTTCTTCTC. *gapdh*: (Genbank: NM\_001256799); forward primer: ACCCACT CCTCCACCTTTG; reverse primer: CTCTTGTGCT CTTGCTGGG. *Esrrb*: (Genbank: NM\_004452) forward primer: CAAGAAGCTCAAGGTGGAGAAGGAGGAG; reverse primer: CGGTCTGTCCGTTTGTCTGTCTGTA GGT. *Esrrg*: (Genbank: NM\_001134285) forward primer: ACCATGAATGGCCATCAGA A; reverse primer: ACC AGCTGAGGGTTCAGGTAT.

## Deep sequencing and differentially expressed genes

2500 ng total RNA from two biological replicates was used to generate cDNA libraries using TruSeq Stranded mRNA Sample Preparation kits (Illumina, San Diego, CA, USA). RNA quality and fragment sizing of cDNA

 Table 3 DY131 altered mRNAs when Esrrb is expressed

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
MTRNR2L8	-6.83	0	0	PIR-FIGF	-2.15	1.69E-35	2.92E-34
MTRNR2L10	-5.31	9.85E-242	4.62E-239	DHRS3	-2.13	4.91E-20	3.92E-19
SNHG5	-5.11	1.21E-277	6.66E-275	RPL38	-2.12	4.53E-247	2.20E-244
RPS29	-4.91	0	0	COX17	-2.11	5.14E-26	5.86E-25
SEC61G	-4.48	2.94E-165	7.90E-163	NFE2	-2.10	7.00E-10	2.63E-09
RPL36A	-4.35	2.3501596881585	0.00E+00	RAB26	-2.09	1.66E-09	6.04E-09
RPL12	-3.62	0	0	NAPRT1	-2.09	1.48E-116	2.20E-114
TMEM212	-3.60	1.12E-56	4.20E-55	CDK5	-2.08	1.31E-28	1.67E-27
ESRG	-3.58	6.76E-114	9.61E-112	NUCB2	-2.08	2.91E-88	2.49E-86
NEDD8-MDP1	-3.47	7.24E-102	7.97E-100	CEBPD	-2.07	5.29E-83	4.08E-81
FOS	-3.34	2.98E-53	9.94E-52	DYNC2LI1	-2.07	5.50E-21	4.63E-20
SLIRP	-3.28	1.01E-127	1.85E-125	RPL34	-2.06	6.26E-174	1.88E-171
MTRNR2L1	-3.12	0	0	SNRPF	-2.06	3.85E-103	4.39E-101
LGALS3	-2.94	3.19E-115	4.69E-113	BCKDHB	-2.05	9.69E-26	1.09E-24
SYTL1	-2.93	9.57E-29	1.23E-27	ANXA1	-2.04	0	0
CLIC3	-2.80	7.42E-29	9.60E-28	RARS2	-2.04	4.40E-37	8.15E-36
WISP2	-2.80	7.36E-56	2.71E-54	CYP4F11	-2.04	1.11E-18	8.08E-18
ABCD3	-2.74	5.71E-21	4.79E-20	SPC24	-2.03	1.42E-17	9.58E-17
TNNT1	-2.69	4.26E-53	1.42E-51	PTP4A3	-2.02	4.47E-19	3.34E-18
RPL31	-2.68	0	0	LOC728190	-2.02	1.35E-12	6.39E-12
ASS1	-2.66	2.78E-30	3.82E-29	PSME1	-2.01	1.62E-81	1.20E-79
EGR1	-2.63	0	0	POLE2	-2.00	3.59E-57	1.37E-55
PSMA1	-2.57	3.99E-89	3.55E-87	NSMCE4A	-2.00	1.78E-61	7.54E-60
MRPL4	-2.56	5.21E-98	5.36E-96	FRA10AC1	-2.00	6.45E-43	1.50E-41
ACPI	-2.55	8.68E-27	1.02E-25	RPS12	-2.00	2.44E-295	1.47E-292
USMG5	-2.54	4.08E-124	6.97E-122	MTRNR2L2	-2.00	4.85E-167	1.33E-164
CRIP1	-2.52	7.63E-155	1.76E-152	TYMP	-2.00	1.58E-35	2.74E-34
STAT4	-2.46	5.11E-22	4.64E-21	RPL11	-2.00	0	0
NDUFA11	-2.45	2.16E-93	2.05E-91	CCDC152	-1.99	6.61E-10	2.49E-09
SCFD1	-2.44	6.21E-304	4.14E-301	MXD3	-1.96	3.65E-27	4.38E-26
CYBA	-2.44	5.78E-17	3.76E-16	IL17RC	-1.95	3.51E-23	3.39E-22
NAPSA	-2.43	2.66E-17	1.77E-16	GRB7	-1.95	1.64E-32	2.49E-31
RPL13AP5	-2.43	0	0	LOC441454	-1.94	8.75E-10	3.24E-09
RPL9	-2.42	0	0	PCCA	-1.94	1.00E-21	8.91E-21
TCTEX1D2	-2.41	6.26E-19	4.62E-18	ACBD4	-1.94	2.15E-40	4.51E-39
MKNK2	-2.35	4.60E-83	3.57E-81	APLP1	-1.93	7.74E-24	7.77E-23
RPL18	-2.35	0	0	QARS	-1.93	2.90E-156	6.93E-154
MUC1	-2.33	2.97E-73	1.75E-71	STX8	-1.93	7.69E-26	8.67E-25
SEPP1	-2.33	4.57E-14	2.42E-13	TM2D1	-1.92	8.60E-25	9.14E-24
PDE9A	-2.32	1.44E-65	7.05E-64	C17orf61	-1.92	1.03E-53	3.49E-52
SEMA6B	-2.32	1.67E—53	5.59E-52	LOC100507156	-1.91	2.19E-24	2.27E-23
RPS15A	-2.30	0	0	KCNAB2	-1.89	1.65E-43	3.93E-42
CNTN1	-2.29	3.68E-18	2.58E-17	CERS4	-1.88	1.66E-27	2.01E-26
CA11	-2.28	8.82E-26	9.90E-25	C18orf8	-1.86	1.06E-73	6.36E-72
TXN	-2.27	0	0	NOTCH3	-1.86	1.46E-16	9.26E-16
LOC728730	-2.26	4.28E-15	2.45E-14	LHPP	-1.86	1.93E-12	9.03E-12
GSTM1	-2.26	3.08E-39	6.17E-38	GNG7	-1.85	2.37E-13	1.19E-12
MACROD1	-2.26	5.25E—17	3.42E-16	RTN2	-1.85	2.10E-09	7.55E-09
CBLC	-2.25	5.56E-23	5.30E-22	SEMA3B	-1.84	2.45E-16	1.52E-15
SUCLG2	-2.24	7.28E-112	9.70E-110	IL6	-1.84	5.35E-17	3.49E-16
PDCD4	-2.21	4.54E-103	5.13E-101	LOC644961	-1.84	1.43E-11	6.24E-11
NDUFB2	-2.16	8.58E-73	4.91E-71	JPX	-1.83	7.74E-11	3.17E-10
C4orf48	-2.16	1.10E-16	7.00E-16	CHCHD6	-1.83	7.00E-19	5.14E-18

PNP.A6         -1.83         335-66         2.77E-84         GLB1L         -1.67         S.33E-14         2.80E-13           FRI.N1         -1.82         S.31E-33         833E-32         PIP83         -1.67         1.56E-24         1.66E-33           SIDT2         -1.81         S.19E-40         1.75E-83         CDK7         -1.67         1.56E-38         2.07E-12         0.86E-07           ZNF826P         -1.81         1.85E-10         7.26E-10         S.C6A3         -1.66         8.34E-08         2.38E-07           ZNF826P         -1.81         1.95E-07         9.36E-66         S100A4         -1.65         7.75E-10         2.86E-07           LMO3         -1.81         1.91E-67         9.36E-66         S100A4         -1.65         1.34E-18         2.34E-02         2.35E-01           DMAC17         -1.81         8.06E-10         3.06E-93         I.71E-01         -1.65         1.34E-18         1.44E-12           SC22A18         -1.80         1.86E-18         3.29E-61         RKN15         -1.64         8.94E-21         3.84E-23           LC1013072         -1.81         1.86E-18         3.29E-61         RKN15         -1.64         8.94E-21         3.84E-23           LC1013072
Fill NI         -1.82         5.31E-33         8.38E-32         IPPR3         -1.67         1.58E-24         1.66E-23           SIDT2         -1.81         5.31E-40         1.07E-38         CDK7         -1.67         1.76E-36         3.16E-35           SIDT2         -1.81         1.25E-08         4.21E-08         ADMA22         -1.66         2.07E-12         9.64E-12           TICS3A         -1.81         1.91E-67         9.80E-66         510044         -1.65         2.28E-08         2.35E-08           DMS2C         -1.81         1.91E-67         9.80E-66         510044         -1.65         2.38E-28         2.35E-83           OCEP         -1.81         1.06E-14         3.00E-09         IFT140         -1.65         1.33E-25         1.48E-24           DNAIC17         -1.81         1.06E-14         3.02E-35         FADS3         -1.65         2.21E-48         6.32E-47           SLC22A18         -1.80         1.38E-36         3.29E-35         FADS1         -1.64         4.58E-21         3.36E-35           LOC100130872         -1.80         6.88E-10         2.30E-08         FRD10         -1.64         6.58E-21         3.36E-25           LOC100130872         -1.78         6.38E-10
SID7         -1.81         5.19E-40         1.07E-38         CDK7         -1.67         1.76E-36         3.16E-35           DEPTOR         -1.81         1.35E-10         7.26E-10         SLC6A3         -1.66         8.34E-08         2.56E-07           ZNR320P         -1.81         1.35E-06         4.21E-08         ADMM22         -1.66         1.65E-98         1.73E-96           TM75P         -1.81         4.87E-17         3.18E-16         EF3K         -1.65         1.35E-21         2.86E-98           CMCP         -1.81         8.06E-10         3.00E-09         IF140         -1.65         1.33E-25         1.48E-24           DNAC17         -1.81         8.06E-10         3.00E-09         IF140         -1.65         1.37E-23         1.44E-23           CLC2A18         -1.80         1.38E-18         XCN15         -1.64         4.58E-21         3.89E-70           SLC2A18         -1.80         3.28E-68         1.70E-66         FKRP10         -1.64         4.58E-07         2.38E-68           LOC10030872         -1.80         6.88E-10         2.04E-33         A.66E-30         2.04E-33           LOC1030872         -1.78         1.37E-10         5.77E-10         RPAP         -1.63 <td< td=""></td<>
DEFTOR         -1.81         1.85E-10         2.26E-00         SLGA3         -1.66         2.84E-08         2.58E-07           ZNF826P         -1.81         1.25E-08         4.21E-08         ADAM22         -1.66         1.05E-98         1.73E-96           TIC39A         -1.81         1.91E-67         9.80E-66         S100A4         -1.65         7.75E-10         2.89E-90           ELMG3         -1.81         2.54E-22         2.33E-21         ANA6         -1.65         1.33E-25         1.44E-24           DNAIC17         -1.81         1.40E-14         7.72E-14         PDIA5         -1.65         1.47E-23         1.44E-24           DNAIC17         -1.81         1.40E-14         7.72E-14         PDIA5         -1.64         1.87E-33         1.44E-24           DNAIC17         -1.81         1.88E-36         3.29E-35         FADS3         -1.64         4.58E-31         3.28E-32           SLC22A18         -1.80         3.28E-68         1.70E-66         FKB10         -1.64         8.94E-41         1.89E-30           LOC10030872         -1.78         3.28E-10         FXP10         -1.64         2.86E-30         1.52E-21           THYN         -1.78         1.37E-10         SAFE-10 <t< td=""></t<>
ZNR20P         -181         125E-08         421E-08         ADA22         -166         207E-12         964E-12           TTG39A         -181         487E-17         318E-16         EF3K         -166         165E-98         175E-00         289E-09           ELM03         -181         254E-22         233E-21         ANXA6         -165         234E-85         235E-83           OCP         -181         806E-10         300E-09         FT140         -165         137E-20         148E-24           DNAC17         -181         806E-10         302E-35         FA053         -165         221E-48         632E-47           SLC22A18         -180         138E-19         145E-18         KCN15         -164         458E-21         389E-20           ALD1381         -180         632E-68         1.70E-66         FK010         -164         230E-31         404E-30           CIC0013027         -180         632E-10         232E-96         KCNN18         -164         338E-20         125E-217           MT1F         -177         907E-41         192E-39         KCNB4         -164         338E-20         125E-217           MT1F         -178         137E-06         547E-10         RT27
TC39A-1.814.87E-173.18E-16ET3K-1.661.65E1.75E-102.75E-102.75E-102.25E-38TM75P-1.811.91E-679.80E-66N0AA-1.652.84E-382.55E-38OCP-1.818.06E-103.00E-09FT140-1.651.33E-251.48E-24DNAC17-1.811.40E-147.72E-14PDIA5-1.651.47E-231.44E-22SIC2A18-1.801.88E-363.29E-38FADS-1.651.47E-231.44E-23SIC2A18-1.801.88E-191.45E-18KCNK15-1.644.58E-213.89E-36ALDH3B1-1.803.28E-681.70E-66FKB10-1.648.94E-411.98E-30LOC1030972-1.806.08E-102.30E-09ACSS2-1.641.07E-941.06E-92ETA-1.790.37E-102.74E-134GSTA4-1.648.95E-072.38E-07ARRIC3-1.790.37E-105.77E-10RIP2-1.633.48E-2201.52E-17MTIF-1.781.37E-106.85E-107RIP2-1.633.48E-233.48E-23ARRIC3-1.781.45E-364.86E-03IRAPC9-1.633.48E-233.48E-23AFSD-1.781.68E-444.13E-43TRAPC9-1.633.48E-233.48E-23AFSD-1.771.68E-181.68E-74A.0ATS14-1.623.48E-341.28E-41OSBL5-1.781.68E-1471.68E-24A.0ATS14-1.623.48E-34 <t< td=""></t<>
TM7SP2         -1.81         1.91E-67         9.80E-66         S100A4         -1.65         7.75E-10         2.89E-09           ELM03         -1.81         2.54E-22         2.35E-21         NANA6         -1.65         2.38E-85         2.35E-38           OCPCP         -1.81         1.40E-14         7.72E-14         POIAS         -1.65         1.47E-23         1.44E-22           DNAC17         -1.81         1.40E-14         7.72E-14         POIAS         -1.65         1.27E-34         6.32E-47           SLC2A18         -1.80         1.38E-36         3.29E-35         FADS3         -1.64         4.98E-21         3.32E-04           SLC2A18         -1.80         3.28E-68         1.70E-66         FKBP10         -1.64         4.98E-21         1.98E-31         4.04E-30           LOC100130872         -1.80         6.08E-10         2.30E-09         ACSS2         -1.64         4.38E-30         1.25E-17           THYN         -1.73         1.37E-10         S.47E-10         RIP2         -1.63         3.48E-202         1.52E-217           MTIF         -1.78         1.45E-08         4.86E-08         UROS         -1.63         3.48E-203         3.52E-14           PIPSKL1         -1.78
ELNO3         -1.81         2.54E-22         2.33E-21         ANXA6         -1.65         2.24E-85         2.33E-81           OOEP         -1.81         8.06E-10         3.00E-09         IFT40         -1.65         1.33E-25         1.44E-24           DNALC17         -1.80         1.83E-36         3.29E-35         FADS3         -1.65         2.21E-48         6.32E-47           SLC22A18         -1.80         1.89E-19         1.45E-18         KCNK15         -1.64         4.58E-21         3.89E-20           ALDH381         -1.80         3.28E-68         1.70E-66         FK8P10         -1.64         8.94E-41         1.89E-39           LOC100130872         -1.80         6.36E-10         2.30E-08         KCNM54         -1.64         8.35E-07         2.38E-06           AKR1G3         -1.79         0.7E-41         1.92E-39         KCNM64         -1.64         8.35E-07         2.38E-06           AKR1G3         -1.78         1.37E-108         4.86E-08         MCOS         -1.63         3.48E-228         3.48E-28           AFFD5         -1.78         1.45E-08         4.86E-48         MCOS         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.78         1.45E-44
COEP         -1.81         8.06E-10         3.00E-09         IFT40         -1.65         1.33E-25         1.48E-24           DNAC17         -1.81         1.40E-14         7.7ZE-14         PDIA5         -1.65         1.47E-23         1.44E-22           TCEA2         -1.80         1.89E-36         3.29E-35         FADS3         -1.65         2.21E-48         3.28E-64           SLC2A18         -1.80         1.89E-19         1.45E-18         KCN15         -1.64         8.94E-41         1.89E-39           SLC2D1030872         -1.80         6.08E-10         2.30E-09         ACS52         -1.64         2.85E-07         2.38E-06           THYN1         -1.79         9.07E-41         1.92E-39         KCNM4         -1.64         2.85E-07         2.38E-07           AKR1G3         -1.78         1.37E-10         5.47E-10         RIP2         -1.63         3.48E-20         1.52E-217           MTIF         -1.78         1.45E-08         4.86E-08         URO5         -1.63         6.3EE-28         8.44E-72           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         5.48E-43         1.28E-41           OSPL5         -1.77         3.05E-09         1.
DNAIC17-1.811.40E-147.72E-14PDIAS-1.651.47E-231.44E-23TCEA2-1.801.38T-363.29E-35FADS3-1.652.21E-486.32E-47SLC22A18-1.801.38E-681.7E-66FKD10-1.648.94E-411.39E-39LOC100130872-1.806.08E-102.30E-09ACSS2-1.641.07E-941.06E-92ETFA-1.791.34E-1362.74E-134GSTA4-1.642.90E-314.04E-30THYN1-1.799.07E-411.92E-39KCNMB4-1.633.48E-2021.52E-217MT1F-1.781.37E-105.7EE-10RPL2-1.633.48E-2031.52E-217MT1F-1.782.33E-109.85E-10IF127-1.634.67E-193.94E-18PPSL1-1.781.45E-084.86E-08UROS-1.634.67E-193.94E-18OSPL5-1.781.68E-08UROS-1.634.67E-193.94E-18OSPL5-1.781.68E-08UROS-1.633.84E-238.44E-23OSPL5-1.773.00E-091.06E-08EF3E-1.625.84E-431.32E-43OSPL5-1.773.00E-091.06E-08EF3E-1.623.34E-2481.69E-248VDR3-1.773.06E-011.06E-03EF3E-1.614.32E-143.22E-17VDK12-1.756.36E-1471.95E-144FBX036-1.614.55E-162.79E-15RUX01-1.766.37E-225.77E-21
TCEA2         -1.80         1.83E-36         3.29E-35         FADS3         -1.65         2.21E-48         6.32E-47           SLC22N18         -1.80         1.89E-19         1.45E-18         KCNK15         -1.64         4.58E-21         3.39E-20           ALDH3B1         -1.80         0.32E-68         1.70E-66         FKBP10         -1.64         8.94E-41         1.89E-39           LCC100130872         -1.80         0.60E-10         2.30E-09         ACSS         -1.64         1.07E-64         1.66E-92           ETFA         -1.79         1.34E-136         2.74E-134         GSTA4         -1.64         2.80E-31         4.04E-30           THN1         -1.79         9.07E-41         1.92E-39         KCNMB4         -1.64         8.53E-07         2.38E-06           AKR1G3         -1.78         1.37E-10         S47E-10         RPL2         -1.63         3.46F-20         1.52E-217           MTF         -1.78         1.38E-44         4.13E-43         TRAPC9         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         3.34E-24         1.58E-317           DSBE15         -1.77         3.05E-019
SLC22A18         -1.80         1.89E-19         1.45E-18         KCNK15         -1.64         4.58E-21         3.89E-20           ALDH3B1         -1.80         3.28E-68         1.70E-66         FKBP10         -1.64         8.94E-41         1.89E-39           LOC10130872         -1.80         6.08E-10         2.30E-09         ACS52         -1.64         1.07E-94         1.06E-02           ETFA         -1.79         1.34E-136         2.74E-134         GSTA4         -1.64         8.58E-07         2.38E-06           AKR1C3         -1.78         1.37E-10         5.47E-10         RPL92         -1.63         3.48E-220         1.52E-217           MTF         -1.78         1.45E-08         4.86E-08         UROS         -1.63         3.68E-28         8.42E-38           APSD         -1.78         1.68E-44         4.13E-43         TAPPC9         -1.63         6.82E-28         8.42E-33           TMEM120A         -1.77         3.00E-09         1.06E-08         EF3E         -1.62         5.48E-43         1.28E-41           OSBPL5         -1.77         3.09E-14         2.10E-13         MT1X         -1.62         3.48E-28         3.48E-28           WDR83         -1.76         3.95E-14
ALDH3B1-1.803.28E-681.70E-66FKBP10-1.648.94E-411.89E-39LOC100130872-1.806.08E-102.30E-09ACS52-1.641.07E-941.06E-92ETFA-1.791.34E-1362.74E-134GSTA4-1.648.53E-072.38E-06HTN1-1.799.07E-411.92E-39KCMM84-1.648.53E-072.38E-06AKR1C3-1.781.37E-10S.74E-10RPL92-1.633.48E-201.52E-217MTIF-1.781.45E-084.86E-08UROS-1.634.67E-193.94E-18PPSKL1-1.782.53E-109.85E-10IF27-1.634.67E-193.94E-18OSPD5-1.771.68E-444.13E-43TRAPPC9-1.634.67E-193.94E-18OSPD5-1.771.06E-091.06E-08IF3E-1.625.48E-431.05E-24OSPD5-1.773.00E-091.06E-08IF3E-1.623.34E-2481.69E-245TENC1-1.773.05E-181.89E-17ACY1-1.623.28E-033.87E-29PPM22-1.763.35E-142.10E-13MT1X-1.624.27E-244.36E-23VDR33-1.764.37E-264.99E-25I.0C64306-1.614.95E-162.79E-15RV42L2-1.756.39E-125.77E-21PACSIN1-1.615.95E-081.10E-43NCX1-1.746.68E-411.42E-39NIT2-1.613.98E-121.42E-14NCX1-1.74<
LOC100130872         -1.80         6.08E-10         2.30E-09         ACSS2         -1.64         1.07E-94         1.06E-92           ETFA         -1.79         1.34E-136         2.74E-134         GSTA4         -1.64         2.80E-31         4.04E-30           THYN1         -1.79         9.07E-41         1.92E-39         KCNMB4         -1.64         8.53E-07         2.38E-06           AKR1C3         -1.78         1.37E-10         5.47E-10         RPL2         -1.63         3.48E-220         5.23E-11           PIPSKL1         -1.78         1.45E-08         4.86E-08         UROS         -1.63         6.82E-42         5.37E-11           MTFF         -1.78         1.68E-44         4.13E-43         TRAPPC9         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         5.48E-43         1.28E-41           OSBPL5         -1.77         3.00E-09         1.06E-08         EIF3E         -1.62         3.34E-248         1.69E-244           VDR3         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         2.33E-10         2.95E-15           RUVBL2         -1.75         8.63E-147
ETFA         -1.79         1.34E-136         2.74E-134         GSTA4         -1.64         2.80E-31         4.04E-30           THYN1         -1.79         9.07E-41         1.92E-39         KCNMB4         -1.64         8.53E-07         2.38E-06           AKR1G3         -1.78         1.37E-10         5.47E-10         RUP2         -1.63         3.48E-202         1.52E-217           MT1F         -1.78         1.45E-08         4.86E-08         UROS         -1.63         6.82E-28         8.44E-27           PIPSKL1         -1.78         1.68E-44         4.13E-43         TRAPP29         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         5.48E-43         1.28E-41           OSRPL5         -1.77         3.00E-09         1.06E-08         EF3E         -1.62         3.34E-248         1.69E-245           TENC1         -1.77         2.65E-18         1.89E-17         ACY1         -1.62         2.38E-30         3.87E-29           VDR32         -1.76         3.37E-21         DCC643406         -1.61         4.39E-14         2.79E-15           RUVB2         -1.75         6.39E-22         5.77E-21 <td< td=""></td<>
THYN1         -1.79         9.07E-41         1.92E-39         KCNMB4         -1.64         8.53E-07         2.38E-06           AKR1C3         -1.78         1.37E-10         S.47E-10         RPLP2         -1.63         3.48E-220         1.52E-217           MTIF         -1.78         1.45E-08         4.86E-08         UROS         -1.63         2.54E-42         S.73E-41           PIPSKL1         -1.78         2.53E-10         9.85E-10         IFT27         -1.63         6.82E-28         8.44E-27           ATP5D         -1.78         1.68E-44         4.13E-43         TRPPO9         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         3.00E-09         1.06E-08         EFF2E         -1.62         3.34E-248         1.69E-245           CSBPL5         -1.77         3.00E-09         1.06E-08         EFF2E         -1.62         2.33E-30         3.8FE-29           CSBPL5         -1.77         3.09E-14         2.10E-13         MT1X         -1.62         2.33E-30         3.8FE-29           VDR83         -1.76         3.95E-14         2.10E-13         MT1X         -1.61         4.27E-24         4.36E-23           VDR83         -1.76         6.36E-147         1.95E
AKR1C3         -1.78         1.37E-10         5.47E-10         RPLP2         -1.63         3.48E-220         1.52E-217           MT1F         -1.78         1.45E-08         4.86E-08         UROS         -1.63         2.54E-42         5.73E-41           PIPSK11         -1.78         2.53E-10         9.85E-10         IFT27         -1.63         4.67E-19         3.49E-18           ATPSD         -1.78         1.68E-44         4.13E-43         TAPPOP         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         3.34E-248         1.62E-415           OSBPLS         -1.77         3.05E-09         1.06E-08         EIF3E         -1.62         3.34E-248         1.69E-245           TENC1         -1.77         2.05E-18         1.89E-17         ACV1         -1.62         2.83E-30         3.87E-29           EPHX2         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         2.83E-30         3.87E-29           RVBL2         -1.75         8.63E-147         1.95E-144         F8X036         -1.61         4.92E-34         1.92E-241           KZALD1         -1.75         6.38E-12 <t< td=""></t<>
MT1F-1.781.45E-084.86E-08UROS-1.632.54E-425.73E-41PIP5KL1-1.782.53E-109.85E-10IFT27-1.634.67E-193.49E-18ATP5D-1.781.68E-444.13E-43TRAPPC9-1.636.82E-288.44E-27TMEM120A-1.771.49E-251.64E-24ADAMTSL4-1.625.48E-431.28E-41OSBPL5-1.773.00E-091.06E-08EIF3E-1.623.34E-2481.69E-248TENC1-1.772.65E-181.89E-17ACY1-1.622.83E-303.87E-29EPHX2-1.763.95E-142.10E-13MT1X-1.622.83E-303.87E-29WDR83-1.764.37E-264.99E-25LOC643406-1.614.55E-162.79E-15RUV8L2-1.756.63E-1471.95E-14FBX03-1.614.39E-451.10E-43KZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.741.23E-094.49E-09FUZ-1.613.08E-121.42E-11NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11DCER1-AS1-1.735.04E-103.14E-09ALDH411-1.602.17E-171.45E-16DCER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.735.04E-101.91E-09PDCD5-1.601.91E-045.92E-63GRAMD
PIPSKL1         -1.78         2.53E-10         9.85E-10         IFT27         -1.63         4.67E-19         3.49E-18           ATPSD         -1.78         1.68E-44         4.13E-43         TRAPPC9         -1.63         6.82E-28         8.44E-27           TMEM120A         -1.77         1.49E-25         1.64E-24         ADAMTSL4         -1.62         5.48E-43         1.28E-41           OSBPL5         -1.77         3.00E-09         1.06E-08         EIF3E         -1.62         3.34E-248         1.69E-24S           TENC1         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         2.83E-30         3.87E-29           PPN22         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         4.27E-24         4.36E-23           WDR83         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         4.27E-24         4.36E-23           RVBL2         -1.75         8.38E-147         1.95E-144         FBX036         -1.61         1.48E-14         8.12E-14           KZZLD1         -1.75         6.39E-22         5.77E-21         PACSIN1         -1.61         3.98E-03         1.87E-07           RPA3         -1.74         6.68E-41         1
ATP5D-1.781.68E-444.13E-43TRAPPC9-1.636.82E-288.44E-27TMEM120A-1.771.49E-251.64E-24ADAMTSL4-1.625.48E-431.28E-41OSBPL5-1.773.00E-091.06E-08EIF3E-1.623.34E-2481.69E-245TENC1-1.772.65E-181.89E-17ACY1-1.622.83E-303.87E-29EPHX2-1.763.95E-142.10E-13MT1X-1.624.27E-244.36E-23WDR83-1.764.37E-264.99E-25LOC643406-1.614.45E-162.79E-15RUVBL2-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.603.08E-121.42E-11DICER1-AS1-1.735.04E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07FML3-1.603.51E-315.00E-30GRAMD2-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63GRAMD2-1.735.04E-101.91E-09PDCD5-1.603.51E-315.00E-30
TMEM120A-1.771.49E-251.64E-24ADAMTSL4-1.625.48E-431.28E-41OSBPL5-1.773.00E-091.06E-08EIF3E-1.623.34E-2481.69E-245TENC1-1.772.65E-181.89E-17ACY1-1.622.83E-303.87E-29EPHX2-1.763.95E-142.10E-13MT1X-1.624.27E-244.36E-23WDR83-1.764.37E-264.99E-25LOC643406-1.614.55E-162.79E-15RUVBL2-1.758.63E-1471.95E-144FBXO36-1.611.48E-148.12E-14KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.731.20E-362.19E-35MFSD3-1.601.37E-445.92E-63PPIH-1.735.14E-081.63E-07EML3-1.601.37E-315.02E-30GRAMD2-1.735.14E-081.63E-07EML3-1.601.37E-445.92E-63 <t< td=""></t<>
OSBPL5         -1.77         3.00E-09         1.06E-08         EIF3E         -1.62         3.34E-248         1.69E-245           TENC1         -1.77         2.65E-18         1.89E-17         ACY1         -1.62         2.83E-30         3.87E-29           EPHX2         -1.76         3.95E-14         2.10E-13         MT1X         -1.62         4.27E-24         4.36E-23           WDR83         -1.76         4.37E-26         4.99E-25         LOC643406         -1.61         4.55E-16         2.79E-15           RUVBL2         -1.75         8.63E-147         1.95E-144         FBX036         -1.61         1.48E-14         8.12E-14           KAZALD1         -1.75         6.39E-22         5.77E-21         PACSIN1         -1.61         4.39E-45         1.10E-43           RPA3         -1.74         6.68E-41         1.42E-39         NIT2         -1.60         3.08E-12         1.42E-11           NOXA1         -1.74         1.23E-09         4.49E-09         FUZ         -1.60         3.08E-12         1.42E-11           TMEM110-MUSTN1         -1.74         5.21E-08         1.65E-07         RPL37         -1.60         2.01E-31         5.02E-31           DICER1-AS1         -1.73         5.04E-10
TENC1-1.772.65E-181.89E-17ACY1-1.622.83E-303.87E-29EPHX2-1.763.95E-142.10E-13MT1X-1.624.27E-244.36E-23WDR83-1.764.37E-264.99E-25LOC643406-1.614.55E-162.79E-15RUVBL2-1.758.63E-1471.95E-144FBXO36-1.611.48E-148.12E-14KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.603.08E-121.42E-11NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.735.04E-101.91E-09PDCD5-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07EML3-1.601.27E-645.92E-63PPIH-1.732.97E-192.25E-18PSMA3-1.601.92E-045.92E-63STXBP2-1.732.73E-721.55E-70TRPT1-1.592.64E-232.56E-22C10orf10-1.733.54E-213.02E-20ALDH6A1-1.599.68E-218.00E-20
EPHX2-1.763.95E-142.10E-13MT1X-1.624.27E-244.36E-23WDR83-1.764.37E-264.99E-25LOC643406-1.614.55E-162.79E-15RUVBL2-1.758.63E-1471.95E-144FBX036-1.611.48E-148.12E-14KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.731.20E-362.19E-35MFSD3-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07EML3-1.603.51E-315.00E-30PPIH-1.732.97E-192.25E-18PSMA3-1.601.27E-645.92E-63STXBP2-1.732.73E-721.55E-70TRP11-1.592.64E-232.56E-22C10orf10-1.733.54E-213.02E-20ALDH6A1-1.599.68E-218.00E-20
WDR83-1.764.37E-264.99E-25LOC643406-1.614.55E-162.79E-15RUVBL2-1.758.63E-1471.95E-144FBXO36-1.611.48E-148.12E-14KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.731.20E-362.19E-35MFSD3-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07EML3-1.601.27E-645.92E-63PPIH-1.732.97E-192.25E-18PSMA3-1.601.93E-961.96E-94STXBP2-1.732.73E-721.55E-70TRPT1-1.592.64E-232.56E-22C10orf10-1.733.54E-213.02E-20ALDH6A1-1.599.68E-218.00E-20
RUVBL2-1.758.63E-1471.95E-144FBXO36-1.611.48E-148.12E-14KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.731.20E-362.19E-35MFSD3-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07EML3-1.601.27E-645.92E-63PPIH-1.732.97E-192.25E-18PSMA3-1.601.93E-961.96E-94STXBP2-1.732.73E-721.55E-70TRPT1-1.592.64E-232.56E-22C10orf10-1.733.54E-213.02E-20ALDH6A1-1.599.68E-218.00E-20
KAZALD1-1.756.39E-225.77E-21PACSIN1-1.615.93E-081.87E-07RPA3-1.746.68E-411.42E-39NIT2-1.614.39E-451.10E-43NOXA1-1.741.23E-094.49E-09FUZ-1.603.08E-121.42E-11TMEM110-MUSTN1-1.745.21E-081.65E-07RPL37-1.602.00E-3011.27E-298CACNA2D2-1.748.47E-103.14E-09ALDH4A1-1.602.17E-171.45E-16DICER1-AS1-1.735.04E-101.91E-09PDCD5-1.606.19E-652.92E-63ABHD14A-ACY1-1.731.20E-362.19E-35MFSD3-1.603.51E-315.00E-30GRAMD2-1.735.14E-081.63E-07EML3-1.601.27E-645.92E-63PPIH-1.732.97E-192.25E-18PSMA3-1.601.93E-961.96E-94STXBP2-1.732.73E-721.55E-70TRPT1-1.592.64E-232.56E-22C10orf10-1.733.54E-213.02E-20ALDH6A1-1.599.68E-218.00E-20
RPA3         -1.74         6.68E-41         1.42E-39         NIT2         -1.61         4.39E-45         1.10E-43           NOXA1         -1.74         1.23E-09         4.49E-09         FUZ         -1.60         3.08E-12         1.42E-11           TMEM110-MUSTN1         -1.74         5.21E-08         1.65E-07         RPL37         -1.60         2.00E-301         1.27E-298           CACNA2D2         -1.74         8.47E-10         3.14E-09         ALDH4A1         -1.60         2.17E-17         1.45E-16           DICER1-AS1         -1.73         5.04E-10         1.91E-09         PDCD5         -1.60         6.19E-65         2.92E-63           ABHD14A-ACY1         -1.73         1.20E-36         2.19E-35         MFSD3         -1.60         3.51E-31         5.00E-30           GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.97E-19
NOXA1         -1.74         1.23E-09         4.49E-09         FUZ         -1.60         3.08E-12         1.42E-11           TMEM110-MUSTN1         -1.74         5.21E-08         1.65E-07         RPL37         -1.60         2.00E-301         1.27E-298           CACNA2D2         -1.74         8.47E-10         3.14E-09         ALDH4A1         -1.60         2.17E-17         1.45E-16           DICER1-AS1         -1.73         5.04E-10         1.91E-09         PDCD5         -1.60         6.19E-65         2.92E-63           ABHD14A-ACY1         -1.73         1.20E-36         2.19E-35         MFSD3         -1.60         3.51E-31         5.00E-30           GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
TMEM110-MUSTN1         -1.74         5.21E-08         1.65E-07         RPL37         -1.60         2.00E-301         1.27E-298           CACNA2D2         -1.74         8.47E-10         3.14E-09         ALDH4A1         -1.60         2.17E-17         1.45E-16           DICER1-AS1         -1.73         5.04E-10         1.91E-09         PDCD5         -1.60         6.19E-65         2.92E-63           ABHD14A-ACY1         -1.73         1.20E-36         2.19E-35         MFSD3         -1.60         1.27E-64         5.92E-63           GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
CACNA2D2         -1.74         8.47E-10         3.14E-09         ALDH4A1         -1.60         2.17E-17         1.45E-16           DICER1-AS1         -1.73         5.04E-10         1.91E-09         PDCD5         -1.60         6.19E-65         2.92E-63           ABHD14A-ACY1         -1.73         1.20E-36         2.19E-35         MFSD3         -1.60         3.51E-31         5.00E-30           GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
DICER1-AS1         -1.73         5.04E-10         1.91E-09         PDCD5         -1.60         6.19E-65         2.92E-63           ABHD14A-ACY1         -1.73         1.20E-36         2.19E-35         MFSD3         -1.60         3.51E-31         5.00E-30           GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
ABHD14A-ACY1       -1.73       1.20E-36       2.19E-35       MFSD3       -1.60       3.51E-31       5.00E-30         GRAMD2       -1.73       5.14E-08       1.63E-07       EML3       -1.60       1.27E-64       5.92E-63         PPIH       -1.73       2.97E-19       2.25E-18       PSMA3       -1.60       1.93E-96       1.96E-94         STXBP2       -1.73       2.73E-72       1.55E-70       TRPT1       -1.59       2.64E-23       2.56E-22         C10orf10       -1.73       3.54E-21       3.02E-20       ALDH6A1       -1.59       9.68E-21       8.00E-20
GRAMD2         -1.73         5.14E-08         1.63E-07         EML3         -1.60         1.27E-64         5.92E-63           PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
PPIH         -1.73         2.97E-19         2.25E-18         PSMA3         -1.60         1.93E-96         1.96E-94           STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
STXBP2         -1.73         2.73E-72         1.55E-70         TRPT1         -1.59         2.64E-23         2.56E-22           C10orf10         -1.73         3.54E-21         3.02E-20         ALDH6A1         -1.59         9.68E-21         8.00E-20
C10orf10 -1.73 3.54E-21 3.02E-20 ALDH6A1 -1.59 9.68E-21 8.00E-20
PLA2G6 -1.73 5.59E-14 2.93E-13 LOC283038 -1.59 3.12E-11 1.32E-10
CHEK2 -1.72 1.79E-46 4.82E-45 BDH2 -1.59 1.27E-17 8.59E-17
SPAG4         -1.72         2.30E-15         1.34E-14         SDHB         -1.59         1.43E-70         7.78E-69
COG6 -1.71 9.36E-37 1.71E-35 ARHGEF25 -1.59 1.35E-29 1.79E-28
TBC1D17         -1.71         7.78E-24         7.79E-23         CYS1         -1.58         4.38E-08         1.40E-07
IFT52 -1.71 6.78E-38 1.30E-36 C8orf45 -1.58 4.42E-08 1.41E-07
GARNL3 -1.71 7.22E-11 2.96E-10 GLTSCR2 -1.57 4.94E-46 1.30E-44
DLST -1.70 2.44E-25 2.67E-24 JMJD8 -1.57 3.93E-28 4.90E-27
ACSF2 -1.69 3.58E-13 1.77E-12 ANKRD24 -1.57 1.17E-07 3.56E-07
RYR1 -1.69 4.48E-09 1.57E-08 SNURF -1.57 6.25E-68 3.23E-66
LOC100134713 -1.68 3.06E-12 1.41E-11 SNRPN -1.57 6.43E-68 3.31E-66
P2RY6 -1.68 7.55E-21 6.27E-20 RCN3 -1.57 1.28E-15 7.56E-15
RARRES3 -1.68 3.75E-07 1.09E-06 LACTB2 -1.57 2.50E-78 1.75E-76
C11orf80 -1.67 5.34E-14 2.81E-13 HSF4 -1.56 1.23E-13 6.27E-13
ELF3 -1.67 2.30E-48 6.58E-47 ENDOV -1.56 4.24E-09 1.48E-08
ADCK4 -1.67 2.68E-40 5.60E-39 CPT1C -1.55 4.07E-07 1.17E-06

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
ITFG1	-1.55	1.10E-88	9.66E-87	GPR108	-1.47	1.33E-60	5.50E-59
IL11RA	-1.55	2.61E-11	1.12E-10	WDR54	-1.46	4.01E-38	7.75E-37
FRG1	-1.55	2.08E-08	6.87E-08	ARHGAP8	-1.46	4.37E-14	2.32E-13
CCDC104	-1.54	8.93E-31	1.25E-29	RPL35A	-1.46	8.72E-183	2.76E-180
CERS1	-1.54	4.07E-08	1.30E-07	GBP2	-1.46	7.43E-12	3.31E-11
GDF1	-1.54	4.07E-08	1.30E-07	TECR	-1.46	1.15E-73	6.86E-72
USP4	-1.54	4.05E-13	2.00E-12	AUH	-1.46	1.97E-08	6.54E-08
PLCD1	-1.54	6.66E-14	3.47E-13	PRR5-ARHGAP8	-1.46	1.99E-14	1.08E-13
PBXIP1	-1.54	5.25E-37	9.70E-36	LINC00263	-1.45	7.89E-17	5.07E-16
NDUFC1	-1.54	1.61E-42	3.66E-41	PDLIM2	-1.45	2.48E-44	6.06E-43
CEP70	-1.54	5.71E-59	2.29E-57	RASA2	-1.45	1.41E-19	1.09E-18
MFSD4	-1.54	2.40E-07	7.10E-07	PTPN6	-1.45	1.25E-36	2.27E-35
ARPC4-TTLL3	-1.53	3.34E-25	3.64E-24	PARL	-1.45	2.07E-65	1.00E-63
XRCC1	-1.53	7.89E-35	1.33E-33	CERCAM	-1.45	1.71E-74	1.04E-72
CLDN4	-1.52	2.47E-20	2.00E-19	RPL37A	-1.45	3.14E-201	1.14E-198
VWA5A	-1.52	7.77E-10	2.90E-09	ARRDC3	-1.45	2.82E-84	2.26E-82
PC	-1.52	1.73E-20	1.41E-19	NAE1	-1.45	1.38E-78	9.72E-77
MMP11	-1.52	1.58E-09	5.74E-09	MYZAP	-1.45	7.55E-09	2.60E-08
C9orf84	-1.52	1.04E-28	1.33E-27	FBXO2	-1.44	3.57E-23	3.45E-22
SLC37A2	-1.52	1.08E-06	2.99E-06	C1QL1	-1.44	1.45E-18	1.05E-17
SUPT3H	-1.52	5.13E-12	2.33E-11	FDPS	-1.44	1.12E-208	4.30E-206
SLC44A3	-1.52	1.17E-11	5.15E-11	FER1L4	-1.44	2.19E-34	3.63E-33
UNC93B1	-1.52	6.48E-37	1.19E-35	TMEM8B	-1.44	2.90E-24	3.00E-23
SLC38A6	-1.52	1.32E-13	6.69E-13	THOC6	-1.44	1.49E-31	2.17E-30
NDUFA1	-1.51	4.88E-40	1.01E-38	DMPK	-1.43	9.94E-26	1.1 IE-24
TMEM205	-1.51	4.08E-37	7.58E-36	RNF181	-1.43	1.88E-42	4.26E-41
ZCRB1	-1.51	2.46E-88	2.13E-86	GUK1	-1.43	3.52E-94	3.37E-92
BRSK1	-1.50	7.65E-10	2.86E-09	GHDC	-1.43	2.52E-15	1.47E-14
HDAC5	-1.50	3.47E-33	5.53E-32	GRAMD1A	-1.43	1.76E-70	9.52E-69
RNASEH2B	-1.50	1.90E-22	1.76E-21	SYTL2	-1.43	3.67E-25	3.98E-24
CLASRP	-1.50	4.14E-23	3.98E-22	LEPR	-1.43	7.79E-22	7.01E-21
CAMK1	-1.50	1.12E-21	1.00E-20	FLJ22184	-1.43	9.59E-18	6.57E-17
C11orf10	-1.49	1.26E-42	2.91E-41	EXOSC9	-1.42	5.87E-47	1.59E-45
PRKCSH	-1.49	5.06E-129	9.41E-127	MMAB	-1.42	2.1 IE-37	4.00E-36
PMF1-BGLAP	-1.49	3.71E-34	6.12E-33	KRT86	-1.42	1.20E-05	2.96E-05
NFASC	-1.49	1.16E-05	2.86E-05	ABHD1	-1.42	7.52E-08	2.34E-07
LTBP4	-1.49	2.21E-61	9.29E-60	HOOK2	-1.42	1.59E-22	1.48E-21
LAMA5	-1.49	2.31E-160	6.08E-158	PCSK4	-1.42	1.40E-10	5.56E-10
LRSAM1	-1.49	5.65E-26	6.42E-25	TMC6	-1.42	1.82E-28	2.31E-27
CTSH	-1.48	6.14E-31	8.67E-30	GDPD1	-1.42	6.19E-06	1.57E-05
HEXB	-1.48	7.22E-108	8.96E-106	LRRC23	-1.42	5.41E-11	2.25E-10
MGST2	-1.48	1.97E-09	7.13E-09	PION	-1.42	3.83E-12	1.75E-11
FAH	-1.48	8.07E-22	7.23E-21	BCL7C	-1.42	9.48E-37	1.73E-35
PEX7	-1.48	2.91E-14	1.56E-13	YPEL3	-1.41	2.79E-10	1.08E-09
C5	-1.48	1.05E-11	4.64E-11	RAD51B	-1.41	7.17E—15	4.03E-14
ACADS	-1.48	2.02E-21	1.76E-20	ANXA4	-1.41	3.39E-64	1.55E-62
IFT43	-1.47	9.38E-15	5.24E-14	B4GALNT4	-1.41	8.74E-13	4.18E-12
JAK3	-1.47	6.46E-12	2.90E-11	COX7B	-1.41	1.11E—66	5.56E-65
MRPL39	-1.47	1.89E-45	4.88E-44	PRKCZ	-1.41	1.76E-15	1.03E-14
SLC43A1	-1.47	3.84E-08	1.23E-07	RAB4B	-1.41	2.43E-21	2.10E-20
EFEMP2	-1.47	9.20E-07	2.56E-06	C4orf34	-1.40	1.44E-38	2.81E-37
SSBP4	-1.47	1.48E-14	8.14E-14	STXIO	-1.40	2.42E-15	1.41E-14
IMMP1L	-1.47	1.82E-07	5.46E-07	CRELD2	-1.40	5.50E-24	5.57E-23

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
ATP5E	-1.39	6.27E-93	5.87E-91	ANKRD13D	-1.34	7.36E-25	7.86E-24
ESD	-1.39	1.48E-75	9.39E-74	C6orf57	-1.34	3.31E-07	9.64E-07
MIA-RAB4B	-1.39	1.84E-21	1.61E-20	GCAT	-1.33	8.16E-10	3.04E-09
NDUFA13	-1.39	5.54E-58	2.17E-56	TEX9	-1.33	1.32E-05	3.23E-05
SNX14	-1.39	3.32E-75	2.09E-73	MAP2K5	-1.33	9.00E-11	3.66E-10
MRPL13	-1.39	2.86E-44	6.97E-43	SLC27A2	-1.33	2.27E-21	1.97E-20
PTPRH	-1.39	7.14E-18	4.93E-17	LTBP3	-1.33	2.53E-43	5.95E-42
BBS5	-1.39	2.36E-32	3.55E-31	LOC100287559	-1.33	4.09E-05	9.47E-05
LMBRD1	-1.38	4.17E-25	4.50E-24	IFITM10	-1.33	9.64E-09	3.28E-08
IQCH	-1.38	4.75E-08	1.51E-07	CRYL1	-1.33	6.22E-10	2.34E-09
LMTK3	-1.38	4.13E-14	2.19E-13	USH1C	-1.33	4.48E-09	1.57E-08
MIR497HG	-1.38	6.24E-12	2.81E-11	ZC3H12D	-1.33	0.000330901	0.000684453
C6orf70	-1.38	3.13E-25	3.41E-24	ERI2	-1.32	7.33E-09	2.53E-08
FGGY	-1.38	5.12E-07	1.46E-06	TBX6	-1.32	0.000899671	0.001760238
UNC5CL	-1.38	1.66E-08	5.52E-08	WBSCR22	-1.32	1.53E-55	5.53E-54
DUT	-1.38	8.03E-114	1.13E-111	GNB2L1	-1.32	2.65E-272	1.40E-269
P2RX4	-1.38	2.17E-20	1.76E-19	LOC100131089	-1.32	3.24E-08	1.05E-07
HHIPL2	-1.38	4.20E-06	1.09E-05	EGFL7	-1.32	8.28E-37	1.52E-35
COX5A	-1.38	3.09E-79	2.21E-77	PIM3	-1.31	6.31E-67	3.18E-65
CKLF	-1.37	6.08E-34	9.94E-33	NUCB1	-1.31	1.86E—79	1.34E-77
CRYZL1	-1.37	7.16E-27	8.45E-26	FDXR	-1.31	1.08E-19	8.38E-19
GSTM4	-1.37	6.05E-20	4.80E-19	EMID1	-1.31	2.72E-09	9.72E-09
DNAH14	-1.37	3.44E-11	1.45E-10	PIBF1	-1.31	2.54E-16	1.58E—15
TCTN1	-1.37	6.80E-12	3.05E-11	HIBCH	-1.30	1.13E—15	6.72E-15
CBX3P2	-1.36	2.01E-06	5.42E-06	RPS7	-1.30	4.23E-158	1.05E-155
PTH1R	-1.36	0.000133911	0.000291689	BIK	-1.30	5.76E—06	1.47E-05
SEMA6C	-1.36	2.31E-09	8.29E-09	TCP11L2	-1.30	9.98E-07	2.77E-06
PIR	-1.36	2.10E-31	3.03E-30	TSNAX-DISC1	-1.30	6.33E-22	5.72E-21
DRAP1	-1.36	2.70E-101	2.90E-99	OMA1	-1.30	1.35E-25	1.50E-24
SCP2	-1.36	1.15E—12	5.47E-12	LOC100506990	-1.30	3.51E-09	1.24E-08
GMDS	-1.36	8.89E-18	6.10E-17	TSTD1	-1.30	7.46E-28	9.23E-27
FRG1B	-1.36	9.55E—13	4.56E-12	KISS1R	-1.30	0.000386067	0.000792495
DECR1	-1.35	4.15E-35	7.08E-34	BCKDHA	-1.29	2.10E-43	4.98E-42
CTAGE5	-1.35	4.25E-40	8.82E-39	B9D1	-1.29	3.14E-13	1.56E-12
NPM3	-1.35	1.82E-40	3.82E-39	ZNF695	-1.29	8.45E-10	3.14E-09
AASS	-1.35	2.75E-05	6.49E-05	TMEM63B	-1.29	2.19E-69	1.17E—67
ZC3H6	-1.35	1.1 IE-29	1.48E-28	MOSPD3	-1.29	8.70E-19	6.37E-18
C6orf203	-1.35	2.06E-08	6.82E-08	RNASE4	-1.29	2.00E-27	2.42E-26
ADAMTS13	-1.35	1.19E—11	5.23E-11	UGGT2	-1.29	6.04E-21	5.06E-20
UBXN11	-1.35	2.01E-06	5.42E-06	SEMA3F	-1.29	2.32E-19	1.77E—18
C10orf54	-1.35	3.00E-63	1.32E-61	RPS24	-1.29	6.92E-214	2.83E-211
LSS	-1.35	7.02E-41	1.49E-39	DAK	-1.29	4.77E-62	2.04E-60
KLC4	-1.35	7.74E-09	2.66E-08	LOC100130691	-1.29	0.000198722	0.0004236
ITGB3BP	-1.35	6.76E-11	2.78E-10	CTU2	-1.29	1.68E-13	8.48E-13
TKTL1	-1.35	2.72E-12	1.26E-11	PLD3	-1.29	7.26E-45	1.81E-43
C10orf55	-1.34	1.16F-63	5.16F-62	RHOV	-1.29	2.06F-15	1.20F-14
CRELD1	-1.34	1.99E-20	1.62E-19	CHPT1	-1.29	5.19E-67	2.64E-65
ADSSL1	-1.34	2.20E-21	1.91E-20	ACSM3	-1.29	3.03E-11	1.29F-10
AI KBH7	-1.34	1.62F-27	1.97E-26	RPS25	-1.28	4.03E-185	1.31E-182
AIFM3	-1.34	5.13E-07	1.47E-06	OASI	-1.28	2.48F-11	1.06F-10
11612	-1.34	2.44F-09	8.76F-09	RPI P1	-1.28	7.23E-219	3.05E-216
SI C 27A1	-1 34	199E-13	9.99F_13	C 19orf79	-1.28	243E-11	1.04F_10
ZRTBROS	_134	5 50E-20	4.37F_10	IL 20BB	-1.28	1.18E_09	432F_00
	T-C.1	J.JUL 20	r.J/L=17		1.20	1.TUL U7	7.521-09

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
CACNG6	-1.28	1.23E-05	3.02E-05	TM4SF19-TCTEX1D	-1.23	1.23E-05	3.02E-05
TBCE	-1.28	1.40E-28	1.78E-27	SRPX	-1.23	5.84E-11	2.42E-10
FBXO16	-1.28	0.00019181	0.000409623	SLC39A11	-1.23	3.03E-21	2.60E-20
LOC100505549	-1.28	9.29E-06	2.31E-05	TMEM41B	-1.22	5.82E-09	2.02E-08
LOC100507218	-1.28	0.000213956	0.000453549	PADI2	-1.22	3.51E-11	1.48E-10
TLR5	-1.28	0.000112273	0.000247109	STX4	-1.22	8.39E-28	1.03E-26
EML2	-1.28	1.54E-14	8.42E-14	MAP4K2	-1.22	1.86E-20	1.51E-19
NPM1	-1.28	3.12E-138	6.48E-136	PXMP4	-1.22	2.50E-07	7.39E-07
GAA	-1.28	1.30E-32	1.99E-31	TCIRG1	-1.22	2.38E-41	5.15E-40
NKD2	-1.28	4.23E-10	1.61E-09	SERPING1	-1.22	8.23E-08	2.55E-07
CRIP2	-1.28	8.19E-11	3.34E-10	IFI35	-1.22	4.92E-13	2.41E-12
LOC100132891	-1.27	6.71E-07	1.89E-06	DPY19L1P1	-1.22	3.99E-07	1.15E-06
ALG5	-1.27	2.16E-16	1.35E-15	MAN2B1	-1.22	5.94E-48	1.67E-46
РХК	-1.27	1.02E-14	5.67E-14	FAF1	-1.22	5.28E-51	1.65E-49
ADA	-1.27	6.1 IE-14	3.20E-13	ZDHHC1	-1.22	2.34E-06	6.25E-06
GALE	-1.27	3.38E-45	8.55E-44	NAAA	-1.21	4.63E-11	1.93E-10
PHGDH	-1.27	3.96E-113	5.44E-111	EFCAB11	-1.21	4.21E-05	9.73E-05
CREG2	-1.27	0.000426556	0.000871508	HSCB	-1.21	1.67E-12	7.85E—12
MSLN	-1.27	2.53E-19	1.93E-18	FBXW9	-1.21	2.21E-05	5.28E-05
GDPD5	-1.27	1.22E-12	5.80E-12	ZNF467	-1.21	1.19E-09	4.36E-09
ITGA7	-1.27	5.07E-06	1.30E-05	ILVBL	-1.21	1.32E-44	3.28E-43
LIG1	-1.27	1.36E-27	1.66E-26	SDR16C5	-1.21	4.72E-17	3.09E-16
LRTOMT	-1.26	4.37E-06	1.13E-05	IQGAP2	-1.21	6.21E-07	1.76E-06
C17orf49	-1.26	1.37E-44	3.39E-43	SRGAP3	-1.21	2.76E-05	6.50E-05
HMGN5	-1.26	5.93E-07	1.69E-06	EGF	-1.21	0.000108319	0.000238866
LOC100505624	-1.26	4.04E-10	1.55E-09	ERGIC3	-1.21	2.97E-63	1.31E-61
CATSPER1	-1.25	0.000949224	0.00184719	CYFIP2	-1.21	3.35E-14	1.79E—13
TLE2	-1.25	2.35E-16	1.46E-15	BCAS3	-1.21	5.34E-23	5.11E-22
CES3	-1.25	5.98E-07	1.70E-06	DOCK11	-1.21	3.15E-11	1.33E—10
TTC35	-1.25	7.52E-30	1.01E-28	SLC37A1	-1.21	1.67E-07	5.02E-07
C6orf72	-1.25	2.65E-33	4.23E-32	HSD17B4	-1.21	1.16E-54	4.10E-53
RPS19	-1.25	1.01E-168	2.84E-166	NT5M	-1.21	7.71E-05	0.000172918
EVI5L	-1.25	3.82E-23	3.68E-22	SERINC5	-1.20	2.82E-06	7.46E-06
LOC81691	-1.25	7.76E-11	3.17E-10	CCDC85B	-1.20	9.58E-95	9.54E-93
PLEKHH3	-1.25	5.91E-39	1.17E-37	ALDH7A1	-1.20	1.18E-61	5.00E-60
LOC100507501	-1.24	1.34E-06	3.67E-06	OPLAH	-1.20	1.60E-21	1.41E-20
SLC25A5-AS1	-1.24	2.22E-20	1.80E-19	ASNS	-1.20	4.29E-106	5.17E-104
RPS8	-1.24	1.41E-201	5.25E-199	KIFAP3	-1.20	4.03E-26	4.60E-25
PPP1R7	-1.24	3.54E-37	6.58E-36	C1R	-1.20	2.83E-07	8.29E-07
MAGED2	-1.24	4.04E-41	8.64E-40	FRY	-1.20	0.000920901	0.001797881
CSTF3	-1.24	1.10E-12	5.24E-12	ANO9	-1.20	7.19E-07	2.02E-06
LINC00467	-1.24	1.39E-17	9.42E-17	BCAM	-1.20	7.19E-33	1.1 IE-31
MAD2L2	-1.24	4.26E-29	5.54E-28	MED30	-1.20	1.06E-13	5.46E-13
РССВ	-1.24	2.05E-53	6.87E-52	LOC100127983	-1.20	6.85E-06	1.73E-05
SEZ6L2	-1.24	1.72E-27	2.09E-26	CBS	-1.20	1.10E-55	4.00E-54
FKBP2	-1.24	8.99F-30	1.20F-28	PNPI A2	-1.19	7.09F-37	1.30F-35
DOCK6	-1.24	4.80F-35	8.13E-34	C10 4	-1.19	1.08F-07	3.32F-07
WIPI1	-1.24	2.07E-06	5.57E-06	LOC100129716	-1.19	0.000363791	0.000749078
ECH1	-1.23	5.12E-76	3.32E-74	ANKRD36BP2	-1.19	0.000287863	0.000599766
OCFL1	-1.23	7.19F-14	3.74E-13	ICMT1	-1.19	7.16F-13	3.45F-12
ZNF385C	-1.23	2.37E-06	6.31E-06	SHE	-1.19	3.46F-06	9.04F-06
ATP8B3	-1.23	6.42E-24	647E-23	RABGGTA	-1 19	2.76E—10	1.07E-09
PAFAH1R2	-1.23	8.05E-25	8.57E-24	ANKRA?	-1.19	4.84F-15	2.76F-14
	1.20	0.0JL ZJ	0.071 24	/ \( \( \( \( \) \) \( \L	1.12	IJTE IJ	2.700-14

SYTL-119847-00624-00CMC4C-115124-00SME-07SME-07DPRODC-119248-05416-34PRG-115248-077.84-07DPRODC-119126-06426-08PRG-115228-1077.84-07DPRODC-118548-07318-05AC612-1151.062-069.86-06SM-118548-071.74-07MC612-1151.062-069.86-06DDX44-118548-071.74-17MC612-1141.062-169.86-06PRM-118548-071.74-17MC612-1141.062-160.72-16PRM-118548-071.74-17MC71-1141.062-160.72-16PRMS-1180.87-122.07-16MC71MC123.16-200.72-16PRMS-1180.87-122.07-16MC71MC123.16-200.72-16C1054-1180.86-17MC612MC12MC143.16-200.36-21C1054-1180.86-17MC612MC12MC143.16-200.0007873C1054-1180.86-17MC612MC143.16-200.0007873MC143.16-20C1054-1180.86-17MC612MC14MC143.16-200.0007873C1054-1170.690-10M0077101MC15MC14MC143.16-20C1054-118MC077101M007121MC15MC16MC14MC14C105	Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
PMODD-1.92.54F-06AEAAEA-1.151.26F-075.53F-07RAP(CAN-1.192.24P-75AIAI-34PCRA-1.152.26F-07AIAI-07RAP(CAN-1.182.31F-053.11F-05KN1827-1.151.26F-062.98F-06SAI-1.182.31F-053.11F-05KN1827-1.151.26F-062.98F-06DDXAQ-1.182.26E-022.26E-01PCRA-1.141.26E-162.77F-05FRAM-1.182.26E-161.26T-17PLNA-1.141.26E-162.72F-05TRAS-1.183.37F-161.28F-17PLNA-1.141.26E-162.52F-05TRAS-1.183.56F-182.26E-50PCR1-1.142.56F-030.0007/374CPS-1.183.56F-18CARE-17PCR1-1.143.17F-058.35F-36CD41-1.180.56F-26CPR1-1.143.17F-058.35F-36CD54-1.180.56F-26CPR1-1.143.17F-058.35F-36CD54-1.180.56F-26CPR1-1.143.17F-058.35F-36CD54-1.180.56F-26CPR1-1.143.17F-058.35F-36CD54-1.180.56F-26CPR1-1.133.00E-4048.35F-36CD54-1.180.56F-26CPR1-1.133.00E-4050.00013/47CD54-1.170.56F-26CPR1-1.133.00E-4050.00013/47CD54-1.170.56F-26 <td< th=""><th>SYT12</th><th>-1.19</th><th>8.47E-20</th><th>6.64E-19</th><th>C9orf46</th><th>-1.15</th><th>1.24E-12</th><th>5.89E-12</th></td<>	SYT12	-1.19	8.47E-20	6.64E-19	C9orf46	-1.15	1.24E-12	5.89E-12
COPK2-1.192.047-934.047-34PROI-1.152.228-247.047-05DCC28783-1.182.136-052.248-04	PYROXD2	-1.19	2.34E-06	6.25E-06	ABCA5	-1.15	1.85E-07	5.53E-07
RAPICAP-1.121.26-062.26-06NI.1NI.1.21.11.26-041.268-05SIR-1.18S.47-47NIC1C2-1.151.06-059.081-05DOMA-1.18S.262-032.74-2.2NIC1C2-1.141.261-178.061-07PIMI-1.182.362-031.252-28PTM5-1.141.261-168.771-16CRIFCAR-1.180.261-222.265-30PTC-1.143.161-657.272-65TRMS-1.180.371-162.265-30PTC-1.143.161-611.366-01CISofac-1.180.361-200.885-29PFR3-1.143.745-100.966-73CISofac-1.180.368-790.662-73CRI2-1.143.745-210.366-73CISofac-1.170.96977010.0017575PTG5-1.130.02363740.0017428CIS-1.170.96971020.0017575PTG5-1.130.02042180.0017428CISA-1.170.968-190.0017575PTG5-1.130.02042180.0014284CISA-1.170.968-190.0017675PTG5-1.130.02042180.0014284CISA-1.170.968-190.0017675PTG5-1.130.00246210.0014284CISA-1.170.968-100.0017675PTG5-1.130.00246210.0014284CISA-1.170.968-100.0017675PTG5-1.130.00246210.0014262CISA-1.170.968-10	COPG2	-1.19	2.42E-35	4.16E-34	RPGR	-1.15	2.48E-07	7.34E-07
ICC289X-1.182180551105MC102-1.151.070629.05-06DVMA-1.18262E-231274-22BRGA-1.14124E-1784.6E-17PIMIA-1.18136E-20126E-15CAL-CMINI-1.14136E-106.27E-16HCC161-1.186.80E-52200E-30RTC-1.1410.6E-166.27E-16HCS161-1.186.80E-52201E-30RTC-1.147.55E-19553E-18C15ork6-1.186.80E-308.85E-30RES1-1.147.55E-19553E-18C15ork6-1.185.57E-182.51E-17RTS171/217513-1.147.55E-19532E-18C15ork6-1.180.00077010.0015276RTC2-1.142.14E-343.85E-30CDF3-1.180.00077010.0015276RTC2-1.142.14E-343.85E-36CDF4-1.180.00077010.0015276RTC2-1.142.14E-343.85E-36CDF3-1.170.00077010.0015276RTC2-1.130.8067370.000737VSG1-1.170.00077010.00152767RTC2-1.130.8067420.000737VSG1-1.170.00077010.00017315RTC1-1.130.8067420.0001736VSG1-1.170.000173150.00017315RTC1-1.130.00174160.0001736VSG1-1.170.000173150.00017315RTC1-1.130.00174610.0001736VSG1-1.17 </td <td>RAP1GAP</td> <td>-1.19</td> <td>1.26E-08</td> <td>4.24E-08</td> <td>PKN1</td> <td>-1.15</td> <td>2.23E-84</td> <td>1.80E-82</td>	RAP1GAP	-1.19	1.26E-08	4.24E-08	PKN1	-1.15	2.23E-84	1.80E-82
SH-1.185.42431.27241WSR27-1.153.271639.86066DOXA3-1.182.2671312.421318.40-1.141.247178.80152PIM-1.182.267161.55115C.1407HIN-1.141.316637.27163FRGT-1.188.607522.207508.72-1.143.351-195.35518FRGS-1.186.567508.86792PRX1-1.144.357-195.35518C150r40-1.186.567508.86792PRX1-1.144.357-195.35518C150r40-1.180.568506.405-25PCF1-1.144.357-930.0007673C157-1.180.568500.0001574FC53-1.142.048340.0007673C15-1.170.568500.0001574FC53-1.140.00380-500.0001674C15-1.170.568500.0001574FC53-1.140.00380-500.0001674C15-1.170.568500.0001574FC54-1.130.0004-5030.0004574VG16-1.170.568570.0001574FC14-1.130.0004-5340.00045052VG17-1.170.568570.00015745FC19-1.130.0004-5340.00045052VG17-1.170.567-571.567-57FC19-1.130.0004-5340.00045052VG17-1.170.567-571.567-57FC19-1.130.0004-5340.577-73 <t< td=""><td>LOC728743</td><td>-1.18</td><td>2.13E-05</td><td>5.11E-05</td><td>ATG16L2</td><td>-1.15</td><td>1.06E-06</td><td>2.95E-06</td></t<>	LOC728743	-1.18	2.13E-05	5.11E-05	ATG16L2	-1.15	1.06E-06	2.95E-06
DDMA-1.182.82-232.7423MR/45-1.14M.17-17M.640-17PMM1-1.83.872918.57-08PTX-1.141.81E-791.31E-77PM125A-1.186.80E-522.20E-50RTX-1.143.57E-185.53E-18C150146-1.186.57E-162.51E-17TNSF12-TNSF13-1.147.55E-195.53E-18C150146-1.186.57E-366.86E-29PCR1-1.147.55E-195.58E-08C150146-1.186.57E-366.46E-25C16P2-1.147.54E-070.00075757C1615-1.180.000775110.00152575FTG4E-1.143.74E-213.88E-03C154-1.176.96E-520.0015747-1.130.00296510.00140575V151-1.170.00027510.00075757FGH4-1.130.00246510.00140867M205-1.176.96E-174.97E-18NFID-1.130.00246140.00140867M205-1.176.96E-174.97E-18NFID-1.130.00246140.00140867M201-1.176.96E-174.97E-18NFID-1.130.00246140.00140867M201-1.176.96E-174.97E-18NFID-1.130.00246140.00140867M201-1.176.96E-174.97E-18NFID-1.130.00246140.00140867M201-1.171.35E-110.0017515NFID-1.130.00246140.00140867M201-1.17	SRI	-1.18	5.42E-43	1.27E-41	WBSCR27	-1.15	3.77E-06	9.80E-06
PMM-1.141.281.282.28PM/S-1.141.18/P/P1.211-77FMM2SA-1.182.267-161.567-160.257-160.212-160.227-160.227-16FMSS-1.183.57-182.307-17TMFS1-1.143.106-010.227-16TMSS-1.183.567-182.567-180.144.338-091.588-031.588-03Clinerda-1.180.588-136.482-176.030-1-1.144.338-031.588-03CDF-1.180.568-266.402-50CEIT-1.142.148-343.368-36CDF-1.180.568-266.402-50CEIT-1.142.148-343.368-36CDF-1.180.568-270.000737010.000230714.1673.188-340.000230710.00023074UKA-1.170.568-170.00017401HEST-1.130.000300740.0004051VGC-1.170.568-170.388-14NEND-1.130.00040510.0004051VGC-1.170.568-170.388-14NEND-1.130.00040510.0004051PANA-1.172.488-170.388-14CCCCB-1.130.00040510.0004051PANA-1.170.568-170.988-15CCCCB-1.130.00040510.0004051PANA-1.170.568-170.988-16CCCCB-1.130.00040510.388-16PANA-1.170.568-170.988-16CCCCB-1.130.00040510.388-16	DDX43	-1.18	2.82E-23	2.74E-22	LRRC45	-1.14	1.24E-17	8.40E-17
FMM2SA-1.182.0716LSES-15CUFC/IMIM-1.14I.06B-16C.72B16THCG1R1-1.186.80F-522.07-0RTC-1.143.10F-085.35E-18C150r48-1.186.80F-322.51E-17IN/ST 2-TN/ST13-1.147.55E-195.35E-18C150r48-1.186.80F-328.85E-39PK1-1.147.45E-031.58E-04C150r4-1.187.03E-186.80F-32CIFI-1.142.14E-343.68E-34C151-1.176.90E-510.00172411.57-1.130.00802743.86E-30C154-1.170.002770110.0017257FGFA-1.130.0064510.0054077VSG1-1.170.00327744.92E-16PMIE-1.130.0046400.0054007VSG1-1.170.00327514.02E-16PMIE-1.130.0046400.0054007VSG1-1.177.05E-174.92E-16PMIE-1.130.0046400.0054007VM1-1.177.05E-174.92E-16PMIE-1.130.0046400.0054007PM2-1.177.05E-174.92E-16PMIE-1.130.0046400.0054007PM2-1.177.05E-174.92E-16PMIE-1.130.00146400.0054007PM2-1.177.05E-174.92E-16PMIE-1.130.00146400.0054007PM2-1.177.35E-115.37E-16PMIE-1.130.00146400.0054007PM2-1.17 <td< td=""><td>PRIM1</td><td>-1.18</td><td>1.39E-29</td><td>1.85E-28</td><td>PTMS</td><td>-1.14</td><td>1.81E-79</td><td>1.31E-77</td></td<>	PRIM1	-1.18	1.39E-29	1.85E-28	PTMS	-1.14	1.81E-79	1.31E-77
InfCin-1.186.80922.20C-90PTC-1.147.147.27C-05THBS-1.183.57E-182.55E-10TTCTTSS-1.147.55E-105.53E-16C15orfMA-1.187.55E-102.53E-16C.1007-1.144.53E-001.58E-08C15orfMA-1.187.53E-106.48E-52PTEN1-1.144.74E-050.0007/571C15-1.185.63E-266.40E-52PTEN1-1.143.77E-068.31E-06ULVA-1.185.63E-260.0007/571FOS5-1.143.77E-068.31E-06ULVA-1.170.0007/5710.0007/571FOS5-1.130.003632670.0007/671VSG1-1.170.0007/5716.76FA-1.130.0004604270.00040027VSG2-1.170.05E-174.93E-16BVF1-1.130.0004604200.00054026AGG1-1.170.05E-174.93E-16BVF1-1.130.0004604200.00040025VSG2-1.172.65E-174.93E-16BVF1-1.130.0004604200.00054026VSG2-1.171.28E-130.00121515KTD10-1.130.0004604200.00054027FCGGT-1.171.28E-141.30E-13MSTC1-1.130.00126424200.00054027FCGGT-1.171.28E-141.30E-13MSTC1-1.130.00126424200.00054027FCGGT-1.171.28E-141.58E-141.58E-141.58E-141.58E-141.58E-141.	FAM125A	-1.18	2.67E-16	1.65E-15	CKLF-CMTM1	-1.14	1.06E-16	6.72E-16
TheGS         -1.18         3.57—18         2.51—17         TMST/2-TMST/3         -1.14         4.53E—09         5.52—18           C11orf54         -1.18         6.58E=30         8.68E-30         FERA1         -1.14         4.53E—00         0.00016734           C15orf68         -1.18         5.63E=36         6.06E=35         FCIF         -1.14         3.17E=-30         3.58E=06           C140         -1.18         6.88E=30         6.00E=35         FCIF         -1.14         3.17E=-31         3.88=-30           C15         -1.17         6.98E=05         0.0005579         FCR4         -1.13         0.000064057         S000000000000000000000000000000000000	HCFC1R1	-1.18	6.80E-52	2.20E-50	BTC	-1.14	3.10E-05	7.27E-05
C1Sor(a)-1.18585–308285–39PRX1-1.144325–091585–33C11or(34-1.18705–16466–75PC(F)-1.14214E-343056–33CDH3-1.18685–591365–57CAL82-1.14317–068355–65CDH3-1.180007770110025275PC(E)-1.14317–068355–65C1S-1.17698–0500001574HES-1.130003037400064207VSG1-1.17605–19447–18NFN0-1.130003037420054207AG05-1.17605–19447–18NFN0-1.13000420122016-20AG17-1.17241–14492–13N11-1.130026–6600042012PN2-1.17132–33213–32R56K2-1.13026–6600042012PN4-1.17132–33213–52R56K2-1.13026–66026–64PN2-1.17132–53215–34SCD184-1.13026–66026–64PN2-1.17169–50135–52CCC288-1.13026–56026–57R56B1-1.17169–57128–74SCD184-1.13026–56026–57R56B1-1.17169–16127–57128–741380209–874238–14R56G2-1.17169–16128–74238–14128–74238–14128–74R56G4-1.17169–16128–74128–14128–74238–14128–74R56G4 </td <td>THBS3</td> <td>-1.18</td> <td>3.57E-18</td> <td>2.51E-17</td> <td>TNFSF12-TNFS"13</td> <td>-1.14</td> <td>7.55E-19</td> <td>5.53E-18</td>	THBS3	-1.18	3.57E-18	2.51E-17	TNFSF12-TNFS"13	-1.14	7.55E-19	5.53E-18
C110rd         -1.18         2036-18         4.866-17         FO3         -1.14         7.455-05         0.00017351           C1SF         -1.18         5036-50         6.406-57         C.4.120         -1.14         3.175-06         3.865-06           ULIA         -1.18         6.00077011         0.00532576         PTC65         -1.14         3.745-06         3.865-06           ULIA         -1.17         6.056-19         4.475-18         NFR80         -1.13         0.0004657         0.00074657           VGG1         -1.17         0.056-19         4.475-18         NFR80         -1.13         0.0004651         0.00074651           VMC1         -1.17         7.555-71         4.937-16         MFR1         -1.13         0.0024422         0.00074651           VMA1         -1.17         2.415-14         1.305-13         0.002-06         0.00021815         NCT019         -1.13         0.002-06         0.00021815         NCT019         -1.13         0.002-06         0.0002-06         0.00021815         NCT019         -1.13         0.002-06         0.0002-06         0.0002-06         0.0002-06         0.0002-06         0.0002-06         0.0002-06         0.0002-06         0.0002-06         0.0000-06         0.0000-06         0.	C15orf48	-1.18	6.58E-30	8.85E-29	PREX1	-1.14	4.53E-09	1.58E-08
CISP-1.185.63-2.636.646-75PC/F1-1.142.146-343.56-36CDH3-1.184.896-591.966-57CAL32-1.143.17E-068.38E-66C1S-1.170.000737010.0015325PC6S-1.130.003303940.00674027VSIG1-1.170.00073120.0007407PGFA-1.130.003403940.00674027AGL-1.170.00074124.97E-18NFABD-1.130.00046312.00E-30AGL-1.170.0052124.97E-18NFABD-1.130.00046312.00E-30PVA-1.172.41E-141.32E-33RJS-65CDGR0-1.130.00E-660.00E-06PKAGR-1.171.32E-332.13E-32RPS682-1.130.00E-660.00E-060.00E-06PCGRT-1.171.21E-251.28E-24CSNN1A-1.130.00E-660.00E-060.00E-06PKAGR-1.171.21E-251.28E-24CSNN1A-1.130.00E-060.00E-060.00E-06PCGRT-1.171.21E-251.28E-24CSNN1A-1.130.00E-060.00E-060.00E-06PCGRT-1.171.21E-251.28E-24CSNN1A-1.130.00E-060.00E-060.00E-06PCGRT-1.171.21E-251.28E-24CSNN1A-1.130.00E-060.00E-060.00E-06PCGRT-1.171.21E-251.28E-24CSNN1A-1.130.00E-060.00E-060.00E-06PCGRT-1.17 <td>C11orf54</td> <td>-1.18</td> <td>7.03E-18</td> <td>4.86E-17</td> <td>FGD3</td> <td>-1.14</td> <td>7.45E-05</td> <td>0.000167354</td>	C11orf54	-1.18	7.03E-18	4.86E-17	FGD3	-1.14	7.45E-05	0.000167354
CDH3-1884896-591066-57CA182-1.14317e-068381-06UIM4-1.130001570100015376PTGES-1.14374E-71318E-70CIS-1.1769E-0600015741HE7-1.13000803794000124087VBC0-1.17605E-174.93E-16BMP1-1.130.0024027000124087AGC1-1.177.55E-174.93E-16BMP1-1.130.00440480.00152087AGC1-1.177.55E-174.93E-16BMP1-1.130.00440480.00152087AW1-1.171.2E-332.162-26MS1-1.130.004640870.0050507FCGR1-1.171.2E-332.162-26CCDC888-1.131.55E-116.73E-11FCGR5-1.171.71E-251.87E-31FCGR4-1.130.0015805070.00297674CMC12-1.171.72E-313.72E-11FCMC1-1.130.0015805070.00297674CMC12-1.171.88E-118.5E-11FCMC1-1.130.0015805070.00256771FGR4-1.171.72E-133.72E-11FCMC1-1.130.0015805070.00256771FGR4-1.171.86E-133.72E-14FCMC1-1.130.0015805070.00256771FGR4-1.171.92E-147.52E-14CCL16-1.130.015805070.0055677FGR4-1.171.92E-147.52E-14CCL16-1.130.9E-140.0055677FGR4-1.17 <t< td=""><td>CTSF</td><td>-1.18</td><td>5.63E-26</td><td>6.40E-25</td><td>PCIF1</td><td>-1.14</td><td>2.14E-34</td><td>3.56E-33</td></t<>	CTSF	-1.18	5.63E-26	6.40E-25	PCIF1	-1.14	2.14E-34	3.56E-33
LLHA-1.180.000770110.0013327PGES-1.143.74E-213.74E-20C1S-1.170.000372120.00015741457-1.130.0038037940.00674057VISIC1-1.170.000372120.0007679FGFA-1.130.000440280.001242867AG1-1.170.56E-174.37E-18NKID-1.130.000440280.00054028VAV1-1.172.41E-141.30E-13NS1-1.130.002440280.0005012PMA2-1.172.33E-050.00121815KTU19-1.130.002464280.0005012FGGRT-1.171.33E-332.3E-25CCD288-1.133.5E-010.67E-11FCGRT-1.171.68E-261.58E-130.5E-116.73E-116.73E-11FCGRT-1.171.58E-111.58E-11NDKONTI-1.133.5E-111.67E-13FCGRT-1.171.58E-111.58E-11NDKONTI-1.130.01583050.0029/784FCGRT-1.171.58E-111.57E-11KTU15-1.130.01583050.0029/784FCGRT-1.171.58E-111.58E-11NDKONTI-1.130.01583050.0029/784FCGRT-1.171.58E-111.58E-11NDKONTI-1.130.01583050.0029/784FCGRT-1.171.58E-111.58E-11NDKONTI-1.130.01583050.0029/784FCGRT-1.171.58E-111.57E-11S.75E-18NDKONTI-1.130.0158205FC	CDH3	-1.18	4.89E-59	1.96E-57	CALB2	-1.14	3.17E-06	8.33E-06
CIS-117698E-0500007571FES7-1130003039300004057VSIG1-1176055-17493E-16FM8D-113806E-24807E-23AG1-1176055-17493E-16FM8D-113000940510005122AVI-117765E-17493E-16FM9D-1130024642800450122PP2-117132E-33R15E-32RP662-11330E-06221E-19FM08C-117533E-05000012815KCD19-11330E-06221E-19FM08C-117198E-31815E-11PM06NT-11330E-06221E-19FCGR1-117198E-11815E-11PM06NT-11330E-06221E-19SREF1-117121E-32378E-31FCD2-11330E-063025771GM12-117128E-11752E-11CM216-113304E-02235E-11IMP2-117127E-11752E-11CM216-113304E-02235E-11IMP2-117127E-11752E-11CM216-113304E-12235E-11IMP2-117127E-13325E-27ARC1-113304E-12305E-32ICFPD-117147E-13325E-27ARC1-113304E-1235E-31IMP2-117147E-13325E-27ARC1-112305E-2274E-33IMP2-117146E-1332E-27ARC1-11230E-1435E-24ICFPD-117 <td>ULK4</td> <td>-1.18</td> <td>0.000777011</td> <td>0.001532576</td> <td>PTGES</td> <td>-1.14</td> <td>3.74E-21</td> <td>3.18E-20</td>	ULK4	-1.18	0.000777011	0.001532576	PTGES	-1.14	3.74E-21	3.18E-20
VNG1         -1.17         0.000372512         0.000579         FGFR4         -1.13         8.06-24         8.07E-32           MED25         -1.17         0.65E-17         4.47E-18         NKBD         -1.13         0.0009451         0.00084205           VAV1         -1.17         2.41E-14         1.30E-13         MSI1         -1.13         0.00464428         0.00090152           PMA2         -1.17         3.32E-05         0.000121815         KCTD19         -1.13         0.00644428         0.000298754           FGRT         -1.17         1.32E-33         0.38E-05         CCDC888         -1.13         0.36E-06         0.37E-11         0.37E-33         0.00298764           ClorH7         -1.17         1.38E-11         0.31E-11         0.38E-41         1.8E-3           SRE8F1         -1.17         2.37E-32         3.7E-31         C/C16         -1.13         0.00194622         0.00298764           ClorH72         -1.17         3.5E-43         1.7E-34         G/C16-16         -1.13         0.00194622         0.0035577           IGFB76         -1.17	C1S	-1.17	6.98E-05	0.00015741	HES7	-1.13	0.003803794	0.00674057
MED25         -1.17         6.05E-19         4.47E-18         NFKBID         -1.13         0.00046/15         0.00142667           AIG1         -1.17         2.05E-107         4.93E-16         BMP1         -1.13         1.37E-31         0.000460152           PVA2         -1.17         1.32E-33         2.13E-32         PS6K82         -1.13         0.0004642         0.00046161           FAM96         -1.17         1.95E-53         CCDC088         -1.13         0.55E-11         6.66E-06         0.66E-06         1.13         0.55E-11         6.75E-01         0.86E-01         0.86	VSIG1	-1.17	0.000372512	0.00076579	FGFR4	-1.13	8.06E-24	8.07E-23
AGI         -1.12         7.65E-17         4.93E-16         BMP1         -1.13         1.35E-31         2.00E-30           WAV1         -1.17         2.41E-14         1.30E-13         MS11         -1.13         0.00240428         0.000450152           PM22         -1.17         5.33E-05         0.000121815         KCD19         -1.13         3.05E-06         0.66E-06           FCGRT         -1.17         1.96E-26         1.95E-26         CCDC88         -1.13         3.05E-01         0.673E-11           EKOSCB         -1.17         1.88E-11         BABE-24         SCNI14         -1.13         0.058805         0.00298794           Clori172         -1.17         1.38E-11         BABE-24         SCNI14         -1.13         0.01914622         0.00398794           Clori172         -1.17         1.38E-11         F2E-11         CXL16         -1.13         0.01914622         0.00398794           MS2         -1.17         1.37E-11         F3E-11         CXL16         -1.13         0.01914622         0.00398797           MS2         -1.17         1.57E-18         CXL16         -1.13         0.01914622         0.0039877           MFPA         -1.17         5.6E-76         MABE-74 <td< td=""><td>MED25</td><td>-1.17</td><td>6.05E-19</td><td>4.47E-18</td><td>NFKBID</td><td>-1.13</td><td>0.00094651</td><td>0.001842867</td></td<>	MED25	-1.17	6.05E-19	4.47E-18	NFKBID	-1.13	0.00094651	0.001842867
WM1         -1.17         2.41E-14         1.36E-13         MS1         -1.13         0.00246428         0.0005125           PPA2         -1.17         1.32E-33         2.13E-32         RP602         -1.13         2.74E-20         2.21E-19           FAM98C         -1.17         5.38E-05         0.000121815         KCTD19         -1.13         3.06E-06         6.76E-06           FCGRT         -1.17         1.89E-10         1.95E-21         CDC888         -1.13         3.82E-31         7.21E-34           FMEM160         -1.17         1.89E-06         2.24E-05         NUP107         -1.13         8.85E-11         0.00298784           Clo712         -1.17         8.99E-06         2.24E-05         NUP107         -1.13         0.00194622         0.003588707           MS2         -1.17         6.70E-36         1.17E-34         GAPDH5         -1.13         0.01914622         0.00358771           IGPEP6         -1.17         1.04E-18         7.52E-18         CXC140         -1.13         0.00194622         0.00356771           IGPEP6         -1.17         7.55E-48         2.12E-04         MXIP         -1.13         0.00194622         0.00356871           IGPAP         -1.16         7.25E-28	AIG1	-1.17	7.65E-17	4.93E-16	BMP1	-1.13	1.37E-31	2.00E-30
PPA2         -1.17         1.32E-33         2.18-22         PS6k82         -1.13         2.24E-30         2.21E-19           FAM98C         -1.17         5.33E-05         0.0012115         KTD 19         -1.13         1.05E-116         6.06E-06           FCGRT         -1.17         1.0FE-25         1.88E-12         CCDC888         -1.13         1.55E-116         7.21E-34           EK05C8         -1.17         1.0FE-25         1.88E-11         POMONT         -1.13         4.23E-35         7.21E-34           GMM160         -1.17         1.88E-11         8.15E-11         POMONT         -1.13         4.23E-35         0.001989307         0.00298787           GOrd72         -1.17         2.51E-32         2.24E-05         NUP107         -1.13         2.10E-54         7.31E-53           MS2         -1.17         1.72E-11         7.22E-11         CXC16         -1.13         3.09E-006         1.22E-07           EF2D         -1.17         1.75E-48         2.12E-46         MXPL         -1.13         3.09E-006         1.32           GRFA         1.72E-3         A.52E-71         1.72E-3         A.52E-71         1.72E-3         3.74E-73         1.72E-73           EF4D         -1.16         7	VAV1	-1.17	2.41E-14	1.30E-13	MSI1	-1.13	0.002464428	0.004500152
FAM98C         -1.17         S33E-05         0.000121815         KCT019         -1.13         3.06E-06         8.06E-05           FCGRT         -1.17         1.69E-26         1.95E-25         CCC0288         -1.13         1.55E-11         G.73E-11           EXOSCS         -1.17         1.88E-11         8.85E-41         C.73E-11         R.73E-11         R.73E-	PPA2	-1.17	1.32E-33	2.13E-32	RPS6KB2	-1.13	2.74E-20	2.21E-19
FCGRT-1.171.69E-261.98E-25CCDC 288-1.131.5E-116.73E-11ENOSCA-1.171.71E-251.88E-24SCNIA-1.134.23E-357.1E-43TMEM160-1.171.71E-251.88E-148.15E-11POMGNT-1.134.23E-357.1E-43SREBF1-1.172.51E-323.78E-31HETD2-1.130.015883050.00296784Clor172-1.178.99E-062.24E-05NUP107-1.132.10E-547.31E-53MSI2-1.171.75E-137.25E-11CXC161-1.135.14E-120.00356771IMPA2-1.171.76E-631.17E-34GAPDF-1.130.01914220.00356771IMPA2-1.171.04E-187.55E-18CAC428FG-1.133.09E-081.32E-05IFAPH-1.167.00E-764.8E-74MIXPL-1.126.00E-061.38E-05IFAAH-1.167.00E-764.8E-74MIXPL-1.125.00E-061.38E-05IFAAH-1.167.2E-289.55E-72ABCA7-1.125.0E-132.4E-13IFAAH-1.167.2E-281.5E-27ABCA7-1.125.0E-143.4E-14IFAAH-1.161.2E-27ABCA7-1.123.0E-178.0E-143.4E-14IFAAH-1.161.3E-051.5E-07PEMT-1.123.0E-143.4E-14IFAAH-1.161.3E-051.5E-07PEMT-1.123.0E-143.4E-14IFAAH-1.16 </td <td>FAM98C</td> <td>-1.17</td> <td>5.33E-05</td> <td>0.000121815</td> <td>KCTD19</td> <td>-1.13</td> <td>3.06E-06</td> <td>8.06E-06</td>	FAM98C	-1.17	5.33E-05	0.000121815	KCTD19	-1.13	3.06E-06	8.06E-06
EXOSC8         -1.17         1.7 E-25         1.8 E-24         SCNN1A         -1.13         4.23E-35         7.2 E-34           TMEM160         -1.17         1.8 E-11         1.8 E-11         POMGNT1         -1.13         8.8 E-14         1.8 E-3           SREBF1         -1.17         2.5 E-32         3.7 E-31         HCTD2         -1.13         0.015 88:05         0.002987874           GOr172         -1.17         8.99E-06         2.24E-05         NUP107         -1.13         0.10E-54         7.3 E-3           MSI2         -1.17         1.7 GCD-36         1.7 E-34         GAPDH5         -1.13         0.001914622         0.00358771           IGFBP6         -1.17         1.04E-18         7.55E-18         CCL16         -1.13         6.00E-06         1.53E-05           EIF2D         -1.17         1.04E-18         7.55E-48         CI22-07         -1.12         6.00E-06         1.53E-05           EIF2D         -1.16         7.05E-74         9.55E-71         GCR2804         -1.12         8.03E-31         2.44E-31           ASL         -1.16         7.25E-28         9.55E-27         QEB34         -1.12         1.8E-31         2.44E-31           FM14A         -1.16         1.22E-27	FCGRT	-1.17	1.69E-26	1.95E-25	CCDC88B	-1.13	1.55E-11	6.73E-11
TMEM160         -1.17         188E-11         815E-11         POMGNT         -1.13         885E-41         1.88E-39           SREB1         -1.17         2.51E-32         3.78E-31         HECTD2         -1.13         0.00158305         0.00298744           Clorl172         -1.17         8.99E-66         2.24E-05         NUP10         -1.13         2.10E-54         7.31E-53           MS12         -1.17         1.72E-11         7.52E-18         CXCL16         -1.13         3.14E-12         2.33E-11           IMPA2         -1.17         1.04E-18         7.55E-18         CXCL46         -1.13         3.79E-08         1.22E-07           IGFBPA         -1.16         7.0E-76         4.88E-74         IF211         -1.12         6.0E-06         1.32E-07           IZA4H         -1.16         7.2E-28         9.33E-27         ABCA7         -1.12         6.0E-06         5.6E-16         0.5E-16           RPH3A         -1.16         1.72E-23         9.59E-72         REB14         -1.12         8.0E-13         2.4E-02           KHDC2         -1.16         2.62E-74         1.59E-72         PEMT         -1.12         4.0E-03         3.7E-03           KHDC2         -1.16         2.62E-74	EXOSC8	-1.17	1.71E-25	1.88E-24	SCNN1A	-1.13	4.23E-35	7.21E-34
SREBF1         -1.17         2.51E-32         3.78E-31         HECTD2         -1.13         0.001588305         0.00296784           Clor172         -1.17         8.99E-06         2.24E-05         NUP107         -1.13         2.16E-54         7.31E-53           MS12         -1.17         1.73E-11         7.72E-11         CXCL16         -1.13         5.14E-12         2.33E-11           IMPA2         -1.17         1.04E-18         7.52E-18         CDC428PG         -1.13         0.00194622         0.00355677           IGFBP6         -1.17         1.04E-18         7.55E-18         CDC428PG         -1.13         3.79E-08         1.22E-07           EIFD         -1.16         7.02E-28         9.52E-77         RCAT         -1.12         5.03E-37         6.68E-13           ASL         -1.16         7.22E-28         9.59E-27         RCRAT         -1.12         5.03E-37         6.68E-13           KHD2         -1.16         7.22E-21         3.99E-20         COPE         -1.12         6.08E-13         6.04E-33           KHD2         -1.16         2.62E-74         1.59E-72         PEMT         -1.12         4.08E-08         1.31E-07           FM1712         -1.16         2.62E-74         7.	TMEM160	-1.17	1.88E-11	8.15E-11	POMGNT1	-1.13	8.85E-41	1.88E-39
Clorf172         -1.17         899E-06         224E-05         NUP107         -1.13         210E-54         731E-53           MS2         -1.17         1.73E-11         732E-11         CXCL16         -1.13         514E-12         233E-11           IMPA2         -1.17         6.70E-36         1.17E-34         GAPDH5         -1.13         514E-12         0.00595771           IGFBP6         -1.17         1.04E-18         7.55E-18         CDC428PG         -1.13         3.79E-08         1.22E-07           EFZD         -1.17         7.55E-48         2.12E-46         MXIPL         -1.12         6.00E-06         1.53E-05           LTAAH         -1.16         7.27E-28         9.33E-27         ABCA7         -1.12         5.03E-32         7.44E-31           SPH3AL         -1.16         1.72E-28         9.33E-27         ABCA7         -1.12         6.08E-31         2.44E-30           KHDC2         -1.16         2.02E-07         1.59E-72         PEMT         -1.12         4.08E-31         2.44E-30           KHDC2         -1.16         2.02E-07         7.15E-07         UQCRC1         -1.12         3.06E-47         2.35E-15           SUGT1         -1.16         3.34E-07         7.25E-05	SREBF1	-1.17	2.51E-32	3.78E-31	HECTD2	-1.13	0.001588305	0.002987874
MS12-1.171.73E-117.52E-11CXCL16-1.135.14E-122.33E-11IMPA2-1.176.70E-361.17E-346.APD45-1.130.001946220.0055677IGFBA-1.171.04E-187.55E-48CDC42BPG-1.130.79E-081.22E-07EF2D-1.167.55E-482.12E-64MXIPL-1.126.00E-061.53E-05LTA4H-1.167.55E-489.53E-27ACA7-1.125.03E-327.44E-31ASL-1.167.72E-289.53E-27ACA7-1.128.06E-013.1E-01RPH3AL-1.161.72E-231.69E-22CPEB14-1.128.06E-313.1E-01KLHDC2-1.162.62E-741.59E-72PEMT-1.124.08E-081.31E-01FAM171A2-1.162.62E-741.59E-72PEMT-1.123.06E-842.42E-82IFR8-1.162.62E-741.59E-72DVAIC4-1.123.06E-842.42E-82SIGRN-1.162.62E-747.15E-07UQCRC1-1.123.06E-842.42E-82SIGRN-1.161.53E-053.72E-05DNAIC4-1.123.06E-842.42E-82SIGRN-1.163.44E-077.15E-07UQCRC1-1.123.06E-914.96E-94SIGR1-1.163.44E-07M2E-95DVAIC4-1.123.06E-943.26E-94GTEP4D2-1.163.44E-07M2E-95DVAIC4-1.123.06E-943.26E-94GTEP4-1.16 <td< td=""><td>Clorf172</td><td>-1.17</td><td>8.99E-06</td><td>2.24E-05</td><td>NUP107</td><td>-1.13</td><td>2.10E-54</td><td>7.31E-53</td></td<>	Clorf172	-1.17	8.99E-06	2.24E-05	NUP107	-1.13	2.10E-54	7.31E-53
IMPA2         -1.17         6.70E-36         1.17E-34         GAPDHS         -1.13         0.001914622         0.003556711           IGFPP6         -1.17         1.04E-18         7.55E-18         CDC428PG         -1.13         3.79E-08         1.22E-07           EIF2D         -1.17         7.55E-48         2.12E-46         MLXPL         -1.12         6.00E-06         1.53E-05           LTA4H         -1.16         7.2E-28         9.58E-27         ABCA7         -1.12         5.03E-32         7.44E-31           ETHE1         -1.16         7.2E-28         9.58E-27         ABCA7         -1.12         8.76E-17         5.61E-16           RPH3AL         -1.16         1.72E-23         1.59E-22         CREB3L4         -1.12         4.08E-08         1.31E-07           FAM17A2         -1.16         2.62E-74         1.59E-72         PEMT         -1.12         4.08E-08         1.31E-07           FAM17A2         -1.16         2.02E-07         7.29E-09         PKN3         -1.12         3.06E-84         2.42E-82           SIGRR         -1.16         1.38E-07         9.72E-07         FIBP         -1.12         3.07E-05         8.54E-05           SIGRR         -1.16         0.34E-07         9.7	MSI2	-1.17	1.73E-11	7.52E-11	CXCL16	-1.13	5.14E-12	2.33E-11
IGFBP6-1.171.04E-187.55E-18CDC42BPG-1.133.79E-081.22E-07EIF2D-1.177.55E-482.12E-46MLXIPL-1.126.00E-061.53E-05LTA4H-1.167.05E-764.88E-74IEZC1-1.125.03E-327.44E-31SL-1.167.2E-289.53E-27ABCA7-1.128.76E-175.61E-16RPH3AL-1.161.72E-231.69E-22CREB14-1.128.76E-175.61E-16RPH3AL-1.162.2E-741.59E-72PEMT-1.124.08E-081.31E-07FAM17A2-1.162.2E-741.59E-72PEMT-1.123.06E-842.42E-32SIGIRR-1.162.2E-097.29E-09PKN3-1.123.06E-082.42E-32SIGIRR-1.161.53E-053.72E-05DNA/C4-1.123.06E-842.42E-32SIGIRR-1.161.53E-053.72E-05DNA/C4-1.123.07E-058.54E-05SIGIRR-1.161.53E-053.72E-05DNA/C4-1.123.07E-058.54E-05SIGIRR-1.163.34E-079.72E-07FIBP-1.123.07E-058.54E-05TXNP-1.160.000127220.00022707KCNN1-1.123.07E-058.54E-05GT24-DD-1.150.0001102720.00022707KCNN1-1.123.66E-132.76E-12GT24-DD-1.150.0001102720.00022707KCNN1-1.123.66E-132.76E-12GT24-DD <td>IMPA2</td> <td>-1.17</td> <td>6.70E-36</td> <td>1.17E-34</td> <td>GAPDHS</td> <td>-1.13</td> <td>0.001914622</td> <td>0.003556771</td>	IMPA2	-1.17	6.70E-36	1.17E-34	GAPDHS	-1.13	0.001914622	0.003556771
EIF2D         -1.17         7.55E-48         2.12E-46         MLXIPL         -1.12         6.00E-06         1.53E-05           LTA4H         -1.16         7.062-76         4.88E-74         IF127L1         -1.12         1.31E-13         6.68E-13           ASL         -1.16         7.22E-28         9.53E-27         ACBC3         -1.12         5.03E-32         7.44E-31           ETH2         -1.16         1.72E-23         1.69E-22         CREB34         -1.12         8.6E-13         2.44E-30           KLH0C2         -1.16         2.62E-74         1.59E-72         PEMT         -1.12         4.08E-30         2.44E-30           FAM171A2         -1.16         2.02E-09         7.29E-09         PKN3         -1.12         4.08E-30         2.42E-32           SIGIRR         -1.16         2.02E-09         7.29E-09         PKN3         -1.12         3.06E-84         2.42E-32           SIGIRR         -1.16         3.41E-07         7.15E-07         DNA/C4         -1.12         3.06E-84         2.42E-32           SIGIRR         -1.16         3.41E-07         7.2E-07         PLO         -1.12         3.06E-13         3.42E-05           SIGIRR         -1.16         3.34E-07         9.2E-13	IGFBP6	-1.17	1.04E-18	7.55E-18	CDC42BPG	-1.13	3.79E-08	1.22E-07
LTA4H         -1.16         7.60E-76         4.88E-74         IFI2/L1         -1.12         1.31E-13         6.68E-13           ASL         -1.16         7.72E-28         9.53E-27         AGCA7         -1.12         5.03E-32         7.44E-31           ETHE1         -1.16         1.72E-23         1.69E-22         CREB3L4         -1.12         8.76E-17         5.61E-16           RPH3AL         -1.16         2.62E-74         1.99E-20         COPE         -1.12         4.08E-08         1.31E-07           FAM17L2         -1.16         2.62E-74         1.99E-70         PKN3         -1.12         4.08E-08         3.11E-07           FAM17L2         -1.16         2.62E-74         1.59E-70         PKN3         -1.12         3.05E-12         9.57E-12           FIR8         -1.16         2.41E-07         7.15E-07         UQCRC1         -1.12         3.05E-13         5.05E-14         2.42E-82           SIGIR         -1.16         1.60E-19         1.22E-18         FAM175A         -1.12         3.67E-05         8.54E-05           SIGIR         -1.16         3.4E-07         9.72E-07         FIBP         -1.12         1.4E-05         2.82E-05           GTE12D         -1.16         3.4E-07	EIF2D	-1.17	7.55E-48	2.12E-46	MLXIPL	-1.12	6.00E-06	1.53E-05
ASL       -1.16       7.72E-28       9.53E-27       ABCA7       -1.12       5.03E-32       7.44E-31         ETHE1       -1.16       1.72E-23       1.69E-22       CREB14       -1.12       8.76E-17       5.61E-16         RPH3AL       -1.16       4.72E-21       3.99E-20       COPE       -1.12       1.68E-31       2.44E-30         KLHDC2       -1.16       2.02E-07       7.99E-07       PKM3       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       2.02E-09       7.29E-09       PKN3       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       2.02E-09       7.29E-07       PKN3       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       2.41E-07       7.15E-07       UQCR1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.69E-19       1.23E-18       FAM175A       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.69E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         SIGT1       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.4E-05       2.82E-05         REP6	LTA4H	-1.16	7.60E-76	4.88E-74	IFI27L1	-1.12	1.31E-13	6.68E-13
ETHE1       -1.16       1.72E-23       1.69E-22       CREB3L4       -1.12       8.76E-17       5.61E-16         RPH3AL       -1.16       4.72E-21       3.99E-20       COPE       -1.12       1.68E-31       2.44E-30         KLHDC2       -1.16       2.62E-74       1.59E-72       PEMT       -1.12       4.08E-08       1.31E-07         FAM171A2       -1.16       2.02E-09       7.29E-09       PKN3       -1.12       3.06E-84       2.42E-82         IFT88       -1.16       2.41E-07       7.15E-07       UQCRC1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.53E-05       3.72E-05       DNAJC4       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         STMIP       -1.16       3.34E-07       9.22E-07       FIB       -1.12       3.67E-03       3.86E-47         GTE24D2       -1.16       3.34E-07       9.27E-07       FIB       -1.12       3.4E-48       3.86E-47         GTE24D2       -1.16       0.00012722       0.0022707       KCN11       -1.12       3.4E-48       3.86E-47         GTE24D2	ASL	-1.16	7.72E-28	9.53E-27	ABCA7	-1.12	5.03E-32	7.44E-31
RPH3AL       -1.16       4.72E-21       3.99E-20       COPE       -1.12       1.68E-31       2.44E-30         KLHDC2       -1.16       2.62E-74       1.59E-72       PEMT       -1.12       4.08E-08       1.31E-07         FAM171A2       -1.16       2.02E-09       7.29E-09       PKN3       -1.12       2.05E-12       9.57E-12         IFT88       -1.16       2.41E-07       7.15E-07       UQCRC1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.53E-05       3.72E-05       DNA/C4       -1.12       3.67E-05       8.54E-05         SUGIR       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         SUGIR       -1.16       3.34E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTE24D2       -1.16       0.00010722       0.00022707       KCNN1       -1.12       1.44E-05       2.82E-05         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         MRC2       -1.15       0.00011109       0.0121929       ASPSCN1       -1.11       5.66E-13       2.07E-12         MRC2	ETHE1	-1.16	1.72E-23	1.69E-22	CREB3L4	-1.12	8.76E-17	5.61E-16
KLHDC2       -1.16       2.62E-74       1.59E-72       PEMT       -1.12       4.08E-08       1.31E-07         FAM171A2       -1.16       2.02E-09       7.29E-09       PKN3       -1.12       2.05E-12       9.57E-12         IFT88       -1.16       2.41E-07       7.15E-07       UQCRC1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.53E-05       3.72E-05       DNAJC4       -1.12       3.67E-05       8.54E-05         SUGT1       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         TXNP       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.4E-05       2.82E-05         GTE4D2D       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.4E-05       2.82E-05         REEP6       -1.15       0.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       0.000611109       0.00122129       ASPSCR1       -1.11       9.88E-50       2.95E-48         GTKL2       -1.15       0.000611109       0.001221292       ASPSCR1       -1.11       3.02E-94       2.95E-44         MRC2       <	RPH3AL	-1.16	4.72E-21	3.99E-20	COPE	-1.12	1.68E-31	2.44E-30
FAM171A2       -1.16       2.02E-09       7.29E-09       PKN3       -1.12       2.05E-12       9.57E-12         IFT88       -1.16       2.41E-07       7.15E-07       UQCRC1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.53E-05       3.72E-05       DNAJC4       -1.12       2.58E-15       1.50E-14         SUGT1       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         TXNIP       -1.16       3.4E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTE2H2D       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.4E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.00611109       0.001212929       ASPSCR1       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-05       0.000151083         ST14 </td <td>KLHDC2</td> <td>-1.16</td> <td>2.62E-74</td> <td>1.59E-72</td> <td>PEMT</td> <td>-1.12</td> <td>4.08E-08</td> <td>1.31E-07</td>	KLHDC2	-1.16	2.62E-74	1.59E-72	PEMT	-1.12	4.08E-08	1.31E-07
IFT88       -1.16       2.41E-07       7.15E-07       UQCRC1       -1.12       3.06E-84       2.42E-82         SIGIRR       -1.16       1.53E-05       3.72E-05       DNAJC4       -1.12       2.58E-15       1.50E-14         SUGT1       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         TXNIP       -1.16       3.34E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTF2H2D       -1.16       0.00102722       0.00227077       KCNN1       -1.12       1.4E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         MRC2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       9.88E-50       2.95E-48         MRC2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       4.07E-177       1.26E-174       CD9       -1.11       6.68E-05       0.000151083         ST	FAM171A2	-1.16	2.02E-09	7.29E-09	PKN3	-1.12	2.05E-12	9.57E-12
SIGIRR       -1.16       1.53E-05       3.72E-05       DNAJC4       -1.12       2.58E-15       1.50E-14         SUGT1       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         TXNIP       -1.16       3.34E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTF2H2D       -1.16       0.000102722       0.00027077       KCNN1       -1.12       1.14E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUN8       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       0.000611109       0.01221929       ASPSCR1       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       0.000611109       0.01221929       ASPSCR1       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083	IFT88	-1.16	2.41E-07	7.15E-07	UQCRC1	-1.12	3.06E-84	2.42E-82
SUGT1       -1.16       1.60E-19       1.23E-18       FAM175A       -1.12       3.67E-05       8.54E-05         TXNIP       -1.16       3.34E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTF2H2D       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.14E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.33E-10       SH2B2       -1.11       1.05E-19       8.16E-19         GRAPL	SIGIRR	-1.16	1.53E-05	3.72E-05	DNAJC4	-1.12	2.58E-15	1.50E-14
TXNIP       -1.16       3.34E-07       9.72E-07       FIBP       -1.12       1.34E-48       3.86E-47         GTF2H2D       -1.16       0.000107222       0.000227077       KCNN1       -1.12       1.14E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.33E-10       SFR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         GUEDC2<	SUGT1	-1.16	1.60E-19	1.23E-18	FAM175A	-1.12	3.67E-05	8.54E-05
GTF2H2D       -1.16       0.000102722       0.000227077       KCNN1       -1.12       1.14E-05       2.82E-05         REEP6       -1.15       1.93E-18       1.38E-17       RQCD1       -1.12       5.66E-19       4.19E-18         AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       5.62E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2	TXNIP	-1.16	3.34E-07	9.72E-07	FIBP	-1.12	1.34E-48	3.86E-47
REEP6         -1.15         1.93E-18         1.38E-17         RQCD1         -1.12         5.66E-19         4.19E-18           AAAS         -1.15         5.67E-34         9.29E-33         JUNB         -1.11         9.88E-50         2.95E-48           CDKL2         -1.15         0.000611109         0.001221929         ASPSCR1         -1.11         5.66E-13         2.76E-12           MRC2         -1.15         2.67E-32         4.02E-31         QPCTL         -1.11         4.68E-25         5.04E-24           RPN2         -1.15         4.07E-177         1.26E-174         CD9         -1.11         3.02E-94         2.91E-92           FN3K         -1.15         5.62E-11         2.33E-10         SH2B2         -1.11         6.68E-05         0.000151083           ST14         -1.15         5.82E-11         2.41E-10         SSR4         -1.11         1.05E-19         8.16E-19           GRAPL         -1.15         0.002321122         0.004253204         NDUFA2         -1.11         8.18E-19         5.99E-18           CUEDC2         -1.15         2.06E-28         2.59E-27         ALPK1         -1.11         1.89E-16         1.19E-15           IF30         -1.15         1.81E-08         6.01E	GTF2H2D	-1.16	0.000102722	0.000227077	KCNN1	-1.12	1.14E-05	2.82E-05
AAAS       -1.15       5.67E-34       9.29E-33       JUNB       -1.11       9.88E-50       2.95E-48         CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH282       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF30       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	REEP6	-1.15	1.93E-18	1.38E-17	RQCD1	-1.12	5.66E-19	4.19E-18
CDKL2       -1.15       0.000611109       0.001221929       ASPSCR1       -1.11       5.66E-13       2.76E-12         MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF30       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	AAAS	-1.15	5.67E-34	9.29E-33	JUNB	-1.11	9.88E-50	2.95E-48
MRC2       -1.15       2.67E-32       4.02E-31       QPCTL       -1.11       4.68E-25       5.04E-24         RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF30       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	CDKL2	-1.15	0.000611109	0.001221929	ASPSCR1	-1.11	5.66E-13	2.76E-12
RPN2       -1.15       4.07E-177       1.26E-174       CD9       -1.11       3.02E-94       2.91E-92         FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF30       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	MRC2	-1.15	2.67E-32	4.02E-31	QPCTL	-1.11	4.68E-25	5.04E-24
FN3K       -1.15       5.62E-11       2.33E-10       SH2B2       -1.11       6.68E-05       0.000151083         ST14       -1.15       5.82E-11       2.41E-10       SSR4       -1.11       1.05E-19       8.16E-19       8.16E-19         GRAPL       -1.15       0.002321122       0.004253204       NDUFA2       -1.11       8.18E-19       5.99E-18         CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF130       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	RPN2	-1.15	4.07E-177	1.26E-174	CD9	-1.11	3.02E-94	2.91E-92
ST14         -1.15         5.82E-11         2.41E-10         SSR4         -1.11         1.05E-19         8.16E-19           GRAPL         -1.15         0.002321122         0.004253204         NDUFA2         -1.11         8.18E-19         5.99E-18           CUEDC2         -1.15         2.06E-28         2.59E-27         ALPK1         -1.11         1.89E-16         1.19E-15           IF30         -1.15         1.81E-08         6.01E-08         GFM2         -1.11         1.22E-54         4.29E-53	FN3K	-1.15	5.62E-11	2.33E-10	SH2B2	-1.11	6.68E-05	0.000151083
GRAPL         -1.15         0.002321122         0.004253204         NDUFA2         -1.11         8.18E-19         5.99E-18           CUEDC2         -1.15         2.06E-28         2.59E-27         ALPK1         -1.11         1.89E-16         1.19E-15           IF130         -1.15         1.81E-08         6.01E-08         GFM2         -1.11         1.22E-54         4.29E-53	ST14	-1.15	5.82E-11	2.41E-10	SSR4	-1.11	1.05E-19	8.16E-19
CUEDC2       -1.15       2.06E-28       2.59E-27       ALPK1       -1.11       1.89E-16       1.19E-15         IF30       -1.15       1.81E-08       6.01E-08       GFM2       -1.11       1.22E-54       4.29E-53	GRAPL	-1.15	0.002321122	0.004253204	NDUFA2	-1.11	8.18E-19	5.99E-18
IFI30 -1.15 1.81E-08 6.01E-08 GFM2 -1.11 1.22E-54 4.29E-53	CUEDC2	-1.15	2.06E-28	2.59E-27	ALPK1	-1.11	1.89E-16	1.19E-15
	IFI30	-1.15	1.81E-08	6.01E-08	GFM2	-1.11	1.22E-54	4.29E-53

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
GPCPD1	-1.11	8.79E-19	6.43E-18	MRPL47	-1.08	2.55E-16	1.58E-15
NDRG2	-1.11	1.37E-06	3.74E-06	ERP44	-1.08	4.10E-42	9.20E-41
PRSS22	-1.11	0.002080435	0.003844256	ARHGEF16	-1.08	5.13E-13	2.51E-12
MST1P9	-1.11	0.002266527	0.004161499	TP53TG1	-1.08	1.83E-05	4.40E-05
TRIM9	-1.11	0.000204924	0.000435644	FA2H	-1.08	1.77E-08	5.89E-08
ATP2A3	-1.11	4.09E-09	1.44E-08	ADAM15	-1.07	4.71E-73	2.73E-71
TMEM161A	-1.11	2.06E-12	9.63E-12	STAG3	-1.07	0.005718352	0.00986248
ING4	-1.11	5.53E-08	1.75E-07	PTK2B	-1.07	4.07E-14	2.16E-13
METTL5	-1.11	9.00E-34	1.46E-32	NSMCE1	-1.07	5.38E-18	3.74E-17
IFT74	-1.11	2.99E-11	1.27E-10	ATXNIO	-1.07	9.31E-82	6.97E-80
GALT	-1.10	9.23E-14	4.76E-13	CCDC53	-1.07	3.48E-15	2.01E-14
ZCWPW2	-1.10	2.10E-32	3.17E-31	MIPEP	-1.07	4.92E-10	1.87E-09
USH1G	-1.10	0.002619829	0.004769462	TNFAIP2	-1.07	1.57E-146	3.48E-144
FAM162A	-1.10	1.90E-18	1.36E-17	PSMA5	-1.07	1.18E-41	2.60E-40
BCL3	-1.10	3.72E-46	9.84E-45	INSIG1	-1.07	8.19E-55	2.90E-53
TSPAN1	-1.10	9.28E-12	4.1 IE-11	KIAA1383	-1.07	4.15E-06	1.07E-05
SIPA1	-1.10	2.57E-25	2.80E-24	SDC2	-1.07	3.27E-05	7.64E-05
WDR27	-1.10	8.86E-07	2.47E-06	COX5B	-1.07	7.29E-32	1.08E-30
LOC678655	-1.10	2.98E-09	1.06E-08	DTX4	-1.07	2.75E-06	7.28E-06
MATN2	-1.10	3.00E-17	1.98E-16	LOC100289495	-1.07	7.59E-05	0.000170296
SERPINI1	-1.10	7.67E-07	2.15E-06	BIN1	-1.07	8.92E-11	3.62E-10
NPRL2	-1.10	8.74E-12	3.88E-11	CLDN7	-1.07	2.52E-17	1.68E-16
IRF6	-1.10	3.53E-11	1.49E-10	LMF1	-1.07	1.18E-05	2.90E-05
C17orf57	-1.10	9.25E-06	2.30E-05	C11orf93	-1.07	0.000180253	0.000386051
HSPB11	-1.10	2.47E-11	1.06E-10	C1RL	-1.06	2.49E-30	3.42E-29
LOXL2	-1.10	2.56E-119	4.1 IE-117	MTMR11	-1.06	8.82E-20	6.91E-19
GATS	-1.10	3.88E-07	1.12E-06	CST6	-1.06	4.12E-16	2.53E-15
POLD1	-1.10	3.61E-38	6.98E-37	CRISPLD1	-1.06	1.71E-07	5.16E-07
KREMEN2	-1.10	0.000906345	0.001771925	PFKL	-1.06	3.28E-73	1.92E-71
SH3YL1	-1.09	7.15E-18	4.93E-17	IER5L	-1.06	1.03E-19	8.04E-19
HEXDC	-1.09	3.33E-08	1.08E-07	NUDT17	-1.06	2.65E-07	7.80E-07
CHIC2	-1.09	5.08E-05	0.000116308	RABAC1	-1.06	9.34E-31	1.31E-29
FLJ39051	-1.09	0.000444045	0.000904903	ABCA2	-1.06	2.56E-49	7.50E-48
ALKBH6	-1.09	4.88E-09	1.70E-08	TRAP1	-1.06	1.61E-76	1.05E-74
MAGOH	-1.09	1.09E-14	6.06E-14	BBS9	-1.06	1.98E-11	8.56E-11
LOC100505783	-1.09	1.52E-05	3.70E-05	MMP15	-1.06	3.72E-27	4.45E-26
C16orf62	-1.09	1.35E-24	1.42E-23	SCPEP1	-1.06	4.13E-22	3.76E-21
GAL3ST1	-1.09	0.004091279	0.00721967	TLL2	-1.06	4.28E-05	9.90E-05
ZNF670-ZNF695	-1.09	6.71E-07	1.89E-06	VPS28	-1.06	3.44E-19	2.60E-18
UGCG	-1.09	2.19E-49	6.44E-48	TCN2	-1.06	9.31E-07	2.59E-06
AS3MT	-1.09	0.000326442	0.000675804	HS1BP3	-1.06	5.55E-20	4.41E-19
GRTP1	-1.09	2.37E-05	5.64E-05	HMG20B	-1.06	9.18E-84	7.22E-82
AQP3	-1.09	3.02E-08	9.82E-08	FUCA1	-1.06	4.76E-18	3.32E-17
TMEM45B	-1.09	7.62E-14	3.95E-13	ARHGEF7	-1.05	1.63E-11	7.10E-11
ZP3	-1.09	2.43E-08	7.96E-08	WDR33	-1.05	6.18E-10	2.33E-09
AP4M1	-1.09	8.43E-09	2.89E-08	SYT13	-1.05	0.004669962	0.008171303
PLD1	-1.09	2.70E-06	7.14E-06	C16orf13	-1.05	3.16E-24	3.26E-23
CCBL2	-1.09	2.76E-20	2.23E-19	KTN1	-1.05	6.31E-91	5.75E-89
NR4A1	-1.08	4.86E-21	4.10E-20	GPX4	-1.05	4.33E-82	3.26E-80
BRE	-1.08	1.97E-33	3.15E-32	RPS16	-1.05	2.85E-107	3.46E-105
PCYOX1L	-1.08	3.06E-15	1.77E-14	AGXT2L2	-1.05	1.67E-12	7.88E-12
KIAA1456	-1.08	4.80E-05	0.000110264	TMEM141	-1.05	1.52E-18	1.09E-17
AARS	-1.08	1.30E-192	4.43E-190	LAMP3	-1.05	4.66E-06	1.20E-05

Gene symbol         logFC         P value         FDR         Gene symbol         logFC         P value	alue FDR	
CDKN1C -1.05 0.000424019 0.000866884 ANXA3 -1.03 1.06	6E—78 7.48E-	-77
LOC100288846 -1.05 0.000988006 0.001917938 C15orf58 -1.02 0.00	0.0025 0.0025	34258
DHRS12 -1.05 0.008237024 0.013823818 RBX1 -1.02 1.31	1E—21 1.16E-	-20
ATP6AP1L -1.05 0.008191315 0.013754406 ABCD1 -1.02 4.71	1E-08 1.50E-	-07
ERCC2 -1.05 4.13E-23 3.98E-22 P4HA3 -1.02 0.00	0.0005 0.0005	57711
FMO5 -1.05 0.008652057 0.014449416 KRBA2 -1.02 0.00	04111753 0.0072	253308
ULK2 -1.05 8.06E-20 6.33E-19 GLS2 -1.02 0.00	0.0005 0.0005	544639
SMARCD3 -1.05 2.06E-08 6.82E-08 ENDOG -1.02 5.93	3E-08 1.87E-	-07
PHYHD1 -1.05 4.25E-11 1.78E-10 COX7C -1.02 6.09	9E-67 3.08E-	-65
C10orf11 -1.05 0.003354135 0.006000913 C8orf59 -1.02 2.88	8E—20 2.32E-	-19
KRTCAP3 -1.05 0.000203547 0.000433154 RAB11FIP4 -1.02 6.08	8E-09 2.11E-	-08
SRP54 -1.05 2.70E-88 2.32E-86 CDKL1 -1.02 8.11	1E-06 2.03E-	-05
IMMP2L -1.04 2.06E-07 6.13E-07 LOC100133957 -1.02 0.00	01919501 0.0035	64787
CARS -1.04 3.50E-44 8.52E-43 DENND1A -1.02 5.20	DE-33 8.18E-	-32
RPL24 -1.04 5.98E-76 3.86E-74 TRAM1 -1.02 1.47	7E—76 9.69E-	-75
GSN -1.04 3.51E-17 2.31E-16 UPK3B -1.02 9.22	2E-07 2.56E-	-06
BAI2 -1.04 9.31E-16 5.58E-15 ANKRD29 -1.02 1.13	3E-27 1.38E-	-26
WDR18 -1.04 1.17E-46 3.16E-45 CHMP5 -1.02 7.09	9E—56 2.61E-	-54
ZC4H2 -1.04 0.009400904 0.015597066 CCDC125 -1.02 4.05	5E—07 1.17E-	-06
EIF3M -1.04 4.78E-59 1.93E-57 MEF2BNB-MEF2B -1.01 0.00	0.0009 0.0009	966579
SLC25A42 -1.04 7.39E-08 2.30E-07 PTPRE -1.01 2.62	2E—47 7.25E-	-46
MTHFR -1.04 2.62E-10 1.02E-09 MAGIX -1.01 0.01	12672093 0.0205	531485
ABCG2 -1.04 0.003349706 0.005994684 MDP1 -1.01 0.00	00316356 0.0006	56213
NR1H3 -1.04 0.000505923 0.001023253 SEMA4G -1.01 2.18	8E-21 1.90E-	-20
PAAF1 -1.04 2.18E-21 1.90E-20 TRMT11 -1.01 7.49	9E—10 2.80E-	-09
GSTK1 -1.04 1.65E-37 3.13E-36 TNFRSF9 -1.01 0.00	01333696 0.0025	540269
DEPDC4 -1.04 0.000125031 0.000273146 AMZ2P1 -1.01 1.77	7E-07 5.32E-	-07
ZNF396 -1.04 2.31E-05 5.51E-05 C7orf10 -1.01 0.00	00709162 0.0014	106426
BHLHE40 -1.04 2.30E-66 1.15E-64 PRPF40B -1.01 5.32	2E-24 5.39E-	-23
TECPR1 -1.04 3.48E-13 1.72E-12 NCOA7 -1.01 8.97	7E—40 1.84E-	-38
AMN1 -1.04 1.59E-07 4.80E-07 MPND -1.01 0.00	0.0003 0.0003	390505
NTPCR -1.04 3.26E-21 2.79E-20 C17orf28 -1.01 1.33	3E-07 4.04E-	-07
MVD -1.04 5.49E-40 1.13E-38 PFDN5 -1.01 1.94	4E-57 7.44E-	-56
RRAS -1.04 1.37E-24 1.44E-23 VWA1 -1.01 1.13	3E—18 8.22E-	-18
LOC144481 -1.03 0.001555384 0.00293074 VPS33B -1.01 4.79	9E-11 2.00E-	-10
SURF1 -1.03 1.48E-25 1.64E-24 PHYHIP -1.00 2.49	9E-07 7.35E-	-07
MFF -1.03 1.03E-98 1.09E-96 SUSD2 -1.00 2.55	5E—29 3.35E-	-28
MAGED1 -1.03 3.74E-72 2.11E-70 CCNA1 -1.00 1.64	4E-08 5.47E-	-08
TBL3 -1.03 7.98E-25 8.51E-24 GAMT -1.00 4.53	3E—10 1.72E-	-09
DYX1C1 -1.03 0.000142357 0.000309076 SLC44A2 -1.00 2.72	2E-41 5.85E-	-40
SLC16A5 -1.03 2.35E-23 2.30E-22 ODF2L -1.00 2.38	8E—16 1.48E-	-15
GPRIN2 -1.03 1.03E-10 4.17E-10 HIST1H1C -1.00 2.07	7E-43 4.93E-	-42
LOC100130015 -1.03 2.39E-07 7.07E-07 TAF10 -1.00 6.64	4E-28 8.23E-	-27
DDX60 -1.03 0.000267213 0.000559136 AKT3 -1.00 7.55	5E—14 3.92E-	-13
MITD1 -1.03 1.44E-11 6.27E-11 MACROD2 -1.00 0.00	0.0147	/82098
RBP1 -1.03 0.006467371 0.011039757 ADAM23 -1.00 1.90	DE-08 6.31E-	-08
TBCA -1.03 5.18E-33 8.15E-32 COQ6 -1.00 2.59	9E—13 1.29E-	-12
ICAM5 -1.03 5.23E-14 2.75E-13 DLEU2 -1.00 0.00	0.0096 0.0096	528891
TNFRSF10C -1.03 0.00023491 0.000494816 CAT -1.00 1.55	5E-30 2.14E-	-29
CPE -1.03 7.1 IE-14 3.70E-13 MSMO1 -1.00 4.14	4E-33 6.57E-	-32
ANK2 -1.03 3.67E-11 1.54E-10 LOC100506334 -1.00 3.11	1E-06 8.17E-	-06
C22orf26 -1.03 0.000452354 0.000920647 TARS2 -1.00 2.70	0E-38 5.25E-	-37
SNX2103 673E_33 104E_31 P4HTM100 117		

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
EBF4	-1.00	0.001175315	0.002258326	LOC283922	1.03	0.001810781	0.003376264
ARHGEF26-AS1	-1.00	0.000118469	0.000259887	GDAP1	1.03	2.93E-52	9.56E-51
OSGEPL1	-1.00	1.23E-11	5.41E-11	KANSL1	1.03	2.80E-09	9.97E-09
PPFIA3	-1.00	2.52E-05	5.96E-05	HOXB5	1.03	4.62E-16	2.83E-15
C19orf71	-1.00	1.03E-05	2.56E-05	LRRC37A4P	1.03	4.01E-19	3.00E-18
CECR2	-1.00	0.000117675	0.000258236	RCBTB2	1.04	0.003040041	0.005483952
NAT14	-0.99	1.20E-13	6.15E-13	MYB	1.04	7.95E-05	0.000177891
FADS2	-0.99	2.47E-79	1.77E-77	SLC35F3	1.04	4.08E-27	4.87E-26
CALCOCOI	-0.99	3.84E-18	2.69E-17	LOC100287314	1.04	0.00752343	0.012712245
APOL1	-0.99	0.000590629	0.001183409	ZNF33A	1.04	7.90E-65	3.71E-63
ITFG3	-0.99	2.53E-39	5.08E-38	TARDBP	1.04	2.43E-135	4.87E-133
KDELC1	-0.99	1.11E-06	3.05E-06	FLJ42627	1.04	3.98E-10	1.52E-09
RPL3	-0.99	1.72E-158	4.35E-156	ZNF239	1.04	4.56E-32	6.76E-31
PLCL2	0.99	1.02E-08	3.47E-08	FAM86DP	1.04	1.66E-10	6.54E-10
AOC2	0.99	5.20E-07	1.48E-06	IL1RL1	1.04	1.54E-08	5.17E-08
ZBTB2	0.99	3.55E-64	1.61E-62	ZNF655	1.05	2.40E-34	3.98E-33
LOC387647	0.99	2.94E-28	3.68E-27	ZNF114	1.05	3.01E-18	2.13E-17
GDF11	0.99	1.84E-42	4.17E-41	FAM35A	1.05	9.15E-46	2.38E-44
LOC100130992	0.99	6.14E-14	3.21E-13	SIX2	1.05	0.000341596	0.000705559
ZNF407	0.99	1.38E-21	1.22E-20	ETS1	1.05	3.20E-96	3.24E-94
LOC100288615	0.99	2.15E-11	9.26E-11	ERVK13-1	1.05	7.87E-08	2.45E-07
TEX15	0.99	1.21E-49	3.59E-48	LOC100288123	1.05	0.003598851	0.006403414
PMS2P5	0.99	2.22E-10	8.68E-10	SPATA13	1.05	5.28E-19	3.92E-18
TSPYL4	1.00	3.02E-31	4.33E-30	PTGER2	1.06	9.55E-10	3.53E-09
FICD	1.00	4.01E-07	1.16E-06	METTL12	1.06	1.30E-08	4.37E-08
ZNF587	1.00	3.63E-30	4.94E-29	GNB3	1.06	0.000318505	0.000659914
ANKRD50	1.00	4.80E-50	1.46E-48	NOG	1.06	0.001463904	0.002772409
NR5A2	1.00	3.61E-06	9.42E-06	LOC100379224	1.06	1.78E-12	8.34E-12
ZBTB40	1.00	9.91E-30	1.32E-28	ZNF514	1.06	2.92E-18	2.07E-17
SLAMF7	1.00	1.57E-11	6.83E-11	LOC100506649	1.06	1.27E-46	3.41E-45
LOC100129046	1.00	2.73E-07	8.03E-07	CHORDC1	1.07	1.72E-57	6.60E-56
PHLPP2	1.00	2.77E-38	5.37E-37	CDKN1A	1.07	7.51E-66	3.68E-64
ZNF267	1.00	7.57E-20	5.95E-19	ARMCX4	1.07	1.38E-14	7.62E-14
FLNC	1.00	9.43E-158	2.29E-155	NBPF1	1.07	1.78E-24	1.86E-23
ZNF850	1.00	1.62E-14	8.85E-14	TJP2	1.07	8.04E-145	1.75E-142
HOXB6	1.00	7.96E-27	9.37E-26	LOC147804	1.07	1.07E-13	5.51E-13
RNF34	1.00	6.70E-44	1.61E-42	PRDM13	1.07	2.87E-07	8.40E-07
FOXO3	1.01	5.30E-30	7.17E-29	SON	1.07	2.20E-170	6.31E-168
HUS1	1.01	1.05E-20	8.65E-20	EPHB2	1.07	6.87E-09	2.37E-08
ZNF185	1.01	1.74E-82	1.33E-80	POM121C	1.08	7.93E-52	2.55E-50
GJA1	1.01	6.19E-16	3.75E-15	ZNF443	1.08	2.53E-07	7.47E-07
AP1S2	1.01	1.54E-19	1.19E-18	JRK	1.08	7.15E-24	7.18E-23
TUBB2A	1.01	9.33E—18	6.40E-17	KBTBD8	1.08	0.000226507	0.000478711
IL16	1.01	0.000167472	0.000360202	ASB16	1.08	1.81E-06	4.90E-06
ZNF799	1.02	1.30E-09	4.76E-09	FAM86B1	1.08	4.25E-08	1.36E—07
LOC100505648	1.02	0.000565896	0.001136915	CREB5	1.08	8.91E—16	5.35E—15
FAM160A1	1.02	0.004606923	0.008071049	VAMP1	1.08	4.97E-14	2.62E-13
KCTD7	1.02	8.21E-16	4.95E-15	USP32P1	1.08	3.37E-24	3.47E-23
ZNF271	1.02	7.41E-78	5.06E-76	IRGQ	1.08	4.72E-37	8.74E-36
LOC401588	1.02	7.86E-08	2.44E-07	RPS26	1.09	8.51E-106	1.02E-103
EIF5A	1.02	1.72E-190	5.72E-188	CLCN4	1.09	2.07E-11	8.92E-11
ABHD16B	1.02	1.13E-13	5.79E-13	DPY19L2	1.09	1.60E-06	4.36E-06
NBPF15	1.03	4.54E-51	1.43E-49	I MPPE	1.10	0.000159821	0.000344921

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
RP9P	1.10	1.53E-14	8.36E-14	BTBD6	1.21	3.31E-124	5.74E-122
ZNF600	1.10	2.10E-16	1.32E-15	ALG10	1.21	3.97E-15	2.28E-14
C17orf51	1.10	5.46E-47	1.48E-45	LINC00338	1.22	2.07E-17	1.38E-16
ABL2	1.10	6.59E-118	1.02E-115	RPL23AP7	1.22	5.87E-08	1.85E-07
ZRSR2	1.11	1.52E-05	3.70E-05	CLDN15	1.22	3.94E-17	2.60E-16
ATAD3B	1.11	3.55E-17	2.34E-16	TUBA4A	1.22	3.74E-64	1.69E-62
ZBTB26	1.11	5.88E-14	3.08E-13	ZNF860	1.22	8.13E-19	5.96E-18
LOC100527964	1.11	0.000167054	0.00035964	NBPFIO	1.23	1.33E-13	6.78E-13
RASSFIO	1.11	0.001652544	0.003100419	EFNB2	1.23	5.00E-20	3.98E-19
WDR52	1.12	0.001376432	0.002616151	C15orf52	1.24	3.83E-77	2.56E-75
ENTPD7	1.12	2.86E-59	1.16E-57	RRS1	1.24	1.88E-119	3.05E-117
KLHL21	1.12	1.76E-47	4.90E-46	OXTR	1.24	1.09E-16	6.95E-16
SERPINB7	1.13	5.41E-06	1.39E-05	CRMP1	1.25	1.15E-06	3.18E-06
TFCP2L1	1.13	4.61E-16	2.82E-15	ZNF440	1.25	3.58E-18	2.52E-17
RFTN1	1.13	4.04E-18	2.83E-17	EIF4EBP3	1.26	0.000648201	0.001292417
PTHLH	1.13	1.75E-07	5.26E-07	DUSP7	1.26	1.51E-29	1.99E-28
C10rf216	1.13	3.58E-29	4.66E-28	EXOG	1.26	8.37E-22	7.50E-21
MGC57346	1.13	1.40E-09	5.11E-09	MAMLD1	1.27	1.94E-25	2.14E-24
MALAT1	1.14	3.24E-113	4.51E-111	SMPD3	1.27	6.68E-09	2.31E-08
NSUN5P1	1.14	1.10E-06	3.03E-06	PNN	1.28	1.20E-105	1.42E-103
C3orf52	1.14	8.59E-13	4.12E-12	PMEPA1	1.28	1.35E-87	1.14E-85
MRPS25	1.14	4.61E-67	2.35E-65	SCARF1	1.29	2.58E-10	1.00E-09
C11orf41	1.14	1.89E-08	6.29E-08	LOC100505815	1.29	1.06E-07	3.24E-07
EPHA4	1.14	1.27E-05	3.12E-05	FBXL19-AS1	1.29	1.55E-13	7.86E—13
LOC283624	1.14	1.05E-22	9.88E-22	HIST1H4H	1.29	1.12E-08	3.80E-08
FRMD6	1.15	1.79E-118	2.83E-116	TUBB	1.30	1.63E-74	9.98E-73
XRCC2	1.15	5.36E-36	9.41E-35	LOC100289230	1.30	0.000190102	0.000406114
ATF5	1.15	7.98E-35	1.34E-33	FAM111B	1.30	2.83E-117	4.27E-115
NOV	1.15	0.000586861	0.00117642	ZNF33B	1.30	1.31E-57	5.07E-56
RPL23AP64	1.15	0.000182902	0.00039146	ZNF121	1.30	1.57E-28	1.99E-27
FGF5	1.15	7.83E-05	0.00017528	ZNF780A	1.30	1.31E-25	1.45E-24
DNAH17	1.16	5.10E-06	1.31E-05	NEFM	1.30	2.06E-10	8.07E-10
PPARGC1B	1.16	8.77E-12	3.89E-11	DGCR11	1.30	1.08E-13	5.52E-13
PEA15	1.16	1.76E-127	3.19E-125	ST20	1.31	5.79E-08	1.83E-07
MIR22HG	1.16	1.55E-27	1.89E-26	ADAM1	1.32	7.15E-10	2.68E-09
LOC219731	1.16	5.88E-05	0.000133586	SRSF1	1.32	1.55E-170	4.54E-168
SLC7A2	1.16	4.67E-05	0.000107518	LOC642846	1.33	2.29E-09	8.22E-09
ZEB1	1.16	2.44E-37	4.58E-36	LOC730755	1.33	4.02E-07	1.16E-06
MOB3C	1.17	1.91E-22	1.77E-21	ZNF594	1.33	2.96E-18	2.10E-17
SBDSP1	1.17	6.56E-27	7.74E-26	ITGA2	1.33	7.36E-102	8.02E-100
LCAT	1.17	3.08E-08	9.99E-08	RRN3P3	1.33	4.14E-10	1.58E-09
HBEGF	1.17	2.63E-45	6.70E-44	MXD1	1.34	2.31E-28	2.90E-27
MGC70870	1.17	1.69E-109	2.14E-107	PKI55	1.35	3.94E-10	1.51E-09
CDC42EP2	1.18	6.61E-33	1.03E-31	LOC100507433	1.35	9.28E-07	2.58E-06
LOC440300	1.18	1.60E-20	1.31E-19	PPAPDC1A	1.35	5.00E-27	5.95E-26
TMED10P1	1.19	1.35E-14	7.42E-14	PIGW	1.35	7.76E-78	5.28E-76
B3GALT5	1.19	0.000161499	0.000348482	NBPF9	1.35	3.18E-46	8.45E-45
BMPER	1.19	4.12E-14	2.19E-13	ZNF782	1.36	4.73E-11	1.97E-10
HERC2P7	1.19	1.08E-15	6.44E-15	RRP7B	1.36	4.18E-08	1.33E-07
SEMA3A	1.20	3.81E-10	1.46E-09	MICA	1.36	1.68E-22	1.56E-21
HNRNPU-AS1	1.20	1.86E-28	2.35E-27	SCARNA12	1.36	4.69E-05	0.000108075
C20orf118	1.20	1.01E-08	3.43E-08	DDX12P	1.36	1.67E-09	6.07E-09
LOC154761	1.21	1.58E-05	3.84E-05	RPSAP9	1.36	5.75E-08	1.81E-07

Gene symbol	logFC	P value	FDR	Gene symbol	logFC	P value	FDR
PLEKHM1	1.37	2.14E-08	7.05E-08	NEAT1	1.55	2.74E-226	1.24E-223
CLDN1	1.37	1.78E-123	2.99E-121	LOC100506123	1.55	6.41E-12	2.88E-11
TUBB1	1.37	1.35E-07	4.10E-07	LOC100506599	1.56	1.30E-08	4.37E-08
SERHL	1.37	2.41E-09	8.64E-09	FOXO3B	1.56	4.19E-17	2.76E-16
YY2	1.38	1.99E-15	1.16E-14	PDIA3P	1.56	1.88E-19	1.44E-18
LOC344595	1.38	8.64E-13	4.14E-12	MMP1	1.56	6.14E-19	4.53E-18
LOC654342	1.39	1.44E-08	4.83E-08	FERMT1	1.57	9.62E-144	2.06E-141
HCN2	1.39	1.10E-05	2.71E-05	NPTX2	1.57	2.39E-07	7.07E-07
TSSK2	1.39	5.96E-06	1.52E-05	MSTO2P	1.58	3.96E-15	2.27E-14
SERTAD4	1.40	4.02E-18	2.81E-17	ZFP112	1.58	2.53E-18	1.80E-17
PTGDR2	1.40	1.65E-14	8.98E-14	AFG3L1P	1.59	3.41E-74	2.05E-72
HTR7P1	1.40	5.99E—16	3.63E-15	TFRC	1.60	1.56E-210	6.16E-208
C10rf63	1.41	2.97E-32	4.44E-31	SPRN	1.63	3.15E-21	2.70E-20
OBFC2A	1.41	1.26E-72	7.20E-71	LOC100133091	1.64	4.17E-08	1.33E-07
ICOSLG	1.41	3.58E-23	3.46E-22	GKN2	1.64	1.01E-19	7.88E-19
PPP1R3E	1.42	8.05E-22	7.22E-21	LOC100272217	1.64	8.20E-08	2.54E-07
F13A1	1.42	1.56E-21	1.37E-20	LOC100132247	1.66	1.26E-11	5.53E-11
WASH1	1.43	1.32E-13	6.69E-13	UBC	1.67	0	0
GNRH1	1.43	7.51E-09	2.59E-08	LOC440894	1.69	4.98E-07	1.42E-06
TLR2	1.44	2.19E-07	6.50E-07	HERC2P2	1.70	1.86E-84	1.51E-82
PXDN	1.45	2.57E-18	1.83E-17	CBWD2	1.70	2.67E-09	9.56E-09
LOX	1.45	4.42E-65	2.1 IE-63	DQX1	1.71	1.13E-10	4.53E-10
EIF3C	1.46	6.70E-21	5.60E-20	CHRM3	1.72	1.40E-14	7.68E-14
EIF3CL	1.46	6.74E-21	5.62E-20	TMEM158	1.72	1.85E-29	2.44E-28
DHRS4L2	1.46	4.24E-11	1.78E-10	G0S2	1.73	4.26E-70	2.29E-68
CD274	1.46	6.02E-65	2.85E-63	LOC100288778	1.77	5.61E-13	2.74E-12
LOC646329	1.46	4.89E-07	1.40E-06	CCZ1	1.81	6.97E-29	9.02E-28
ZNF767	1.46	6.55E-20	5.19E-19	GPR89A	1.81	6.1 IE-21	5.12E-20
SPNS2	1.46	4.72E-21	3.99E-20	DOK3	1.83	1. OOE-10	4.05E-10
LOC401431	1.47	1.10E-13	5.62E-13	C6orf141	1.85	7.97E-58	3.1 IE-56
SHISA7	1.47	1.52E-07	4.60E-07	NAV3	1.85	1.21E-68	6.33E-67
WASH3P	1.47	1.01E-15	6.05E-15	HERC2P9	1.85	9.07E-20	7.09E-19
C12orf34	1.47	6.88E-13	3.32E-12	GOLGA8B	1.86	5.17E-113	7.03E-111
LOC728643	1.47	6.16E-10	2.32E-09	OPHN1	1.93	1.05E-64	4.92E-63
PI4KAP1	1.48	3.1 IE-15	1.80E-14	TAGLN	1.94	2.23E-95	2.24E-93
HSPA8	1.48	0	0	PRG4	1.95	6.72E-29	8.72E-28
BCL2A1	1.48	1.71E-11	7.41E-11	NBPF16	1.95	1.02E-114	1.48E-112
ADAMTS6	1.49	3.58E-06	9.33E-06	AGAP6	1.96	2.09E-25	2.30E-24
SPIN2B	1.49	1.12E-09	4.12E-09	PFN1P2	2.05	1.19E-30	1.65E-29
TUBAIB	1.49	4.03E-278	2.32E-275	PPP1R11	2.18	2.28E-16	1.42E-15
TNFAIP3	1.50	3.05E-159	7.86E-157	HMGA2	2.19	7.78E-56	2.85E-54
CCDC39	1.50	3.75E-05	8.72E-05	SRSFIO	2.22	1.64E-22	1.53E-21
WASH5P	1.51	3.91E-50	1.19E-48	GOLGA8A	2.30	1.62E-88	1.41E-86
SPHK1	1.52	4.08E-27	4.87E-26	LOC100216001	2.32	1.88E-13	9.49E-13
ZNF417	1.53	1.87E-17	1.25E-16	NBPF14	2.34	4.08E-85	3.35E-83
LOC100289019	1.53	3.60E-10	1.38E-09	LOC284454	2.42	2.30E-69	1.22E-67
TUBA1C	1.54	0	0	ESM1	2.55	6.08E-25	6.53E-24
BMS1P5	1.54	2.70E-06	7.16E-06	LOC613037	2.70	2.83E-23	2.74E-22
BMS1P1	1.54	2.71E-06	7.17E-06				
SHISA9	1.54	1.40E-48	4.04E-47				
SOX9	1.54	1.14E-50	3.52E-49	library were	determined	by the Universit	ty of Missouri
ENC1	1.55	3.65E-104	4.24E-102	DNA coro D		ing was parform	ad by the MIT
PLEKHA8P1	1.55	4.63E-10	1.76E-09	DNA core i	ising Illumi	na HiSeq 2000	following the

# Table 4 Gene ontology analysis of Esrrb-dependent DY131-altered genes

Term (down-regulated genes)	Count	P value
GO:0042273 ~ ribosomal large subunit biogenesis	4	0.007
GO:0006297 ~ nucleotide-excision repair, DNA gap filling	4	0.032
GO:0006541 ~ glutamine metabolic process	4	0.042
GO:0009083 ~ branched chain family amino acid catabolic process	5	0.001
GO:0042274 ~ ribosomal small subunit biogenesis	5	0.001
GO:0009081 ~ branched chain family amino acid metabolic process	5	0.004
GO:0006904 ~ vesicle docking during exocytosis	5	0.016
GO:0048278 ~ vesicle docking	5	0.021
GO:0006958 ~ complement activation, classical pathway	5	0.031
GO:0022406 ~ membrane docking	5	0.038
GO:0002455 ~ humoral immune response mediated by circulating immunoglobulin	6	0.008
GO:0009060 ~ aerobic respiration	6	0.014
GO:0006635 ~ fatty acid beta-oxidation	7	0.001
GO:0009062 ~ fatty acid catabolic process	7	0.003
GO:0019395 ~ fatty acid oxidation	7	0.005
GO:0034440 ~ lipid oxidation	7	0.005
GO:0033559 ~ unsaturated fatty acid metabolic process	7	0.019
GO:0009064 ~ glutamine family amino acid metabolic process	7	0.020
GO:0019228 ~ regulation of action potential in neuron	7	0.024
GO:0006289 ~ nucleotide-excision repair	7	0.026
$GO:0051591 \sim response to cAMP$	8	0.002
GO:0006800 ~ oxygen and reactive oxygen species metabolic process	8	0.021
GO:0001508 ~ regulation of action potential	8	0.023
GO:0009566 ~ fertilization	8	0.046
$GO:0044242 \sim cellular linid catabolic process$	q	0.013
$GO:0007160 \sim cell-matrix adhesion$	9	0.013
$GO:0060627 \sim regulation of vesicle-mediated transport$	9	0.046
GO:0000027 regulation of vesicle intellated italisport	10	0.002
$CO:0045233 \approx cellular respiration$	10	0.002
$CO.0007568 \approx 2000$	10	0.020
CO-0016485 ~ aging	10	0.040
CO-0006364 ~ rRNA processing	10	0.044
CO:0016072 rPNA processing	11	0.003
$GO_{0006997} \sim \text{max}$ the labour process	11	0.007
$GO_{10000000} \sim exolytosis$	10	0.022
$CO(0009310 \sim annu e catabolic process$	12	0.000
$GO_{10016125} \sim choicesterol metabolic process$	12	0.001
$GO(001232) \sim \text{steror metabolic process}$	12	0.005
$GO(004259) \sim regulation of membrane potential$	12	0.024
	12	0.036
GO:0042254 ~ hbosome biogenesis	13	0.005
GO:0016053 ~ organic acid biosynthetic process	14	0.013
GO:0046394 ~ Carboxylic acid biosynthetic process	14	0.013
GO:0022613 ~ ribohucieoprotein complex biogenesis	14	0.038
GO:0016042 ~ lipid catabolic process	15	0.013
GUUUUU6457 ~ protein tolaing	15	0.016
GU:UU344/U ~ ncKNA processing	15	0.025
GU:UU229UU ~ electron transport chain	16	0.000
GO:0032940 ~ secretion by cell	16	0.026
GO:0016054 ~ organic acid catabolic process	17	0.000

Term (down-regulated genes)	Count	P value
GO:0046395 ~ carboxylic acid catabolic process	17	0.000
GO:0034660 ~ ncRNA metabolic process	19	0.008
GO:0006631 ~ fatty acid metabolic process	21	0.000
GO:0046903 ~ secretion	22	0.014
GO:0006414 ~ translational elongation	25	0.000
GO:0008610 ~ lipid biosynthetic process	26	0.002
GO:0006091 ~ generation of precursor metabolites and energy	31	0.000
GO:0006412 ~ translation	38	0.000
GO:0016192 ~ vesicle-mediated transport	39	0.003
GO:0055114 ~ oxidation reduction	54	0.000
Term (up-regulated genes)	Count	P value
GO:0002220 ~ innate immune response activating cell surface recentor signaling pathway	2	0.045
$GO:0048712 \sim$ negative regulation of astrocyte differentiation	2	0.045
$GO:0000724 \sim$ double-strand break repair via homologous recombination	3	0.020
$GO(0000725 \sim recombinational renair$	3	0.020
$GO(000725) \approx recombinational repair$	л	0.020
$GO(0045933 \sim \text{positive regulation of muscle contraction}$	4	0.007
$CO(0006040 \approx regulation of smooth muscle contraction$	4	0.002
CO(0050768 + regulation of sindour muscle contraction	4	0.009
$GO_{100}$	4	0.013
$GO_{100}GO_{10}$ = regulation of cell development	4	0.018
$GO_{100}$	5	0.030
GO:0040706embruonis chalatal system morphogenesis	5 E	0.004
$GO_{10}$	5	0.012
GO:0007411 - expendicion of cell projection organization	5	0.019
CO(0051258) protein polymorization	5	0.033
GO:0031258 ~ protein polymenzation	6	0.000
GO:0045025 ~ cellular protein complex assembly	6	0.039
$GO_{100}^{00}$ = challen of the integration of th	0	0.042
$GO_{10046703} \sim \text{skeletal system morphogenesis}$	7	0.002
GO:000264 ~ regulation of cell development	/	0.031
$GO_{100}$ = 1000 and 1000 an	0	0.000
GO:000116 anti anontoria	ð	0.007
	0	0.010
GO:0001501 ~ Iniciolubule-based process	8	0.027
GO:0001501 ~ skeletal system development	9	0.031
GO:000917 ~ Induction of apoptosis	9	0.031
GO:0012502 ~ Induction of programmed cell death	9	0.032
GO:0040000 - regative regulation of cell differentiation	10	0.001
GO:00420008 ~ regulation of growth	10	0.017
GO:0043066 ~ negative regulation of apoptosis	10	0.021
GO:0043069 ~ negative regulation of programmed cell death	10	0.023
GO:0060548 ~ negative regulation of cell death	10	0.023
GO:0022403 ~ cell cycle phase	10	0.049
	12	0.021
GO:0042127 ~ regulation of cell proliferation	17	0.018
GO:0042981 ~ regulation of apoptosis	18	0.011
GU:UU43Ub/~ regulation of programmed cell death	18	0.012
GO:0010941 ~ regulation of cell death	18	0.012
GO:0006355 ~ regulation of transcription, DNA-dependent	29	0.047

Table 4 continued

Term (up-regulated genes)	Count	P value	
GO:0051252 ~ regulation of RNA metabolic process	30	0.038	
GO:0006350 ~ transcription	43	0.000	
GO:0045449 ~ regulation of transcription	48	0.001	

manufacture's instruction. Briefly, samples (8 total) were pooled into one lane with each sample annealed to a specific indexed adaptor. 50 bp single end reads were generated. For each sample, approximately 18 million reads were generated in.fastq format (NCBI-GEO, accession number: GES71208). The sequencing reads were trimmed and filtered using FASTX-Toolkit (V 0.0.13) (http://hannonlab.cshl.edu/fastx toolkit), and mapped to genome (UCSC hg18) using TopHat2 [39, 40]. Gene expression values were determined by gene raw read counts using an in-house tool MULTICOM-MAP [41-43]. Raw reads were normalized to each sample's library size and differentially expressed genes were calculated using R/Bioconductor package edgeR [44]. Specifically, we kept the genes that have at least 1 count-per-million (cpm) in at least 2 samples and computed the effective library sizes. Pairwise gene expression tests were carried out using exact test. Differentially expressed genes were determined by log2 fold change (Log2FC) (Log2FC > 1, or Log2FC < -1), p value (p < 0.05) and false discovery rate (FDR < 0.05) [45].

#### Gene set function enrichment

Gene ontology (GO) analysis was performed using DAVID bioinformatics sources 6.7 [46, 47]. Differentially expressed genes from certain pairwise comparisons were uploaded to DAVID server (http://david.abcc.ncifcrf.gov) and GO analysis were performed for biological process (BP). Minimum counts were set as default value (two counts) and maximum EASE score (*p* value) was set to 0.05. Differentially expressed genes pathway enrichment analysis was performed using Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway [48, 49]. Gene expression profiles Spearman ranking correlation analysis was analyzed using R (version 3.0.2). Gene expression heat map and hierarchical clustering were created by R/ Bioconductor (version 2.13) package gplot.

## Statistical analysis

qPCR experiments were performed in triplicate on both biological replicates. T test was employed to statistically analyze whether the differences in gene expression is significant (p < 0.05). Statistical significance of gene set overlap (Venn Diagram) are tested according to previous reported method [17].

## Availability of supporting data

The data sets supporting the results of this article are available in the NCBI-GEO repository, accession number: GSE71208, URL: http://www.ncbi.nlm.nih.gov/geo/ query/acc.cgi?acc=GSE71208.

## **Additional files**

Additional file 1: Figure S1. DY131-activated Esrrb regulates p21. Figure S2. Full gel images.

Additional file 2: Table S1. Gene ontology analysis result. Table S2. Esrrb expression with DY131 treatment (control vs. Esrrb + DY131).

#### Abbreviations

Esrrb: estrogen related receptor beta; ERRE: estrogen related receptor response element; SFRE: steroid factor response element; iPSC: induced pluripotent stem cells; OSKM: Oct4, Sox2, Klf4, cMyc; FBS: fetal bovine serum; RT: reverse transcriptase; KEGG: Kyoto encyclopedia of genes and genomes; GO: gene ontology; FC: fold change; Esrrg: estrogen related receptor gamma.

#### Authors' contributions

YL established the model cell line and performed RNA isolation, Esrrb expression status test, western blot, cell growth assay, differentially expressed gene analysis, functional enrichment of gene sets by GO and KEGG pathway, construct gene regulation network and statistical analysis. YL, JL, JC performed sequence alignment and generated the gene expression count table for RNA-seq data analysis. YL and DBL conceived of the study, participated in its design and drafted the manuscript. All authors read and approved the final manuscript.

#### Author details

<sup>1</sup> Department of Biochemistry, University of Missouri, Columbia, MO 65211, USA. <sup>2</sup> MU Center for Botanical Interaction Studies, University of Missouri, Columbia, MO 65211, USA. <sup>3</sup> Computer Science Department, University of Missouri, Columbia, MO 65211, USA. <sup>4</sup> Informatics Institute, University of Missouri, Columbia, MO 65211, USA. <sup>5</sup> Xiphophorus Genetic Stock Center, Texas State University, San Marcos, TX 78666, USA.

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#### **Competing interests**

The authors declare that they have no competing interests.

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