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Original Article

The TGFβ1-FOXM1-HMGA1-TGFβ1 positive feedback loop increases the cisplatin resistance of non-small cell lung cancer by inducing G6PD expression

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Abstract: Platinum-based chemotherapy is still widely applied for the treatment of advanced non-small cell lung cancer (NSCLC). However, acquired chemoresistance compromises the curative effect of this drug. In this study, we found that glucose-6-phosphate dehydrogenase (G6PD), a critical enzyme of the pentose phosphate pathway, contributed to cisplatin resistance in NSCLC. The experimental results showed that transforming growth factor beta 1 (TGFβ1) increased the expression of G6PD by activating the forkhead box protein M1-high mobility group AT-hook 1-G6PD (FOXM1-HMGA1-G6PD) transcriptional regulatory pathway, in which TGFβ1 inhibited the ubiquitination and degradation of FOXM1 protein. Additionally, HMGA1 induced TGFβ1 expression, and neutralized TGFβ1 in the culture medium downregulated HMGA1 levels, suggesting the existence of a TGFβ1-FOXM1-HMGA1-TGFβ1 positive feedback loop and its role in maintaining G6PD expression. Further investigations showed that exogenous TGFβ1 enhanced the cisplatin resistance of NSCLC cells, while disrupting the FOXM1-HMGA1-G6PD pathway, thereby sensitizing the cells to cisplatin. Consistently, the TGFβ1-FOXM1-HMGA1-G6PD axis was confirmed in NSCLC tissues, and overactivation of this axis predicted poor survival in NSCLC patients. Collectively, the results of this study demonstrate that the TGFβ1-FOXM1-HMGA1-TGFβ1 positive feedback loop plays a crucial role in the cisplatin resistance of NSCLC by upregulating the expression of G6PD, providing a potential therapeutic target to restore chemosensitivity in cisplatin-resistant NSCLC.

Keywords: Non-small-cell lung cancer (NSCLC), transforming growth factor β1 (TGFβ1), forkhead box protein M1 (FOXM1), high-mobility group A1 (HMGA1), glucose-6-phosphate dehydrogenase (G6PD), cisplatin resistance

Introduction

Lung cancer is the most common and fatal cancer worldwide, and non-small cell lung cancer (NSCLC) accounts for about 85% of all lung cancers. At present, platinum-based chemotherapy is the standard treatment for NSCLC [1]; however, the response rates range between 10% and 25% because of acquired resistance [2, 3]. The mechanisms underlying the resistance to platinum are not fully understood.

Transforming growth factor beta 1 (TGFβ1) promotes the epithelial to mesenchymal transition (EMT), angiogenesis, and metastasis during the advanced stages of tumor development [4]. Recently, some studies have focused on the role of TGFβ1 in chemoresistance. In drug-resistant colorectal carcinoma cells, 5-fluorouracil (5FU)-induced TGFβ1 protected cells against the toxic action of the drug [5]. Another study showed that TGFβ1-dependent activation of SMAD/ERK signaling conferred temozolomide resistance in glioblastoma [6]. Additionally, it was found that TGFβ1 enhances the gemcitabine resistance of bladder cancer, and TGFβ1 stimulation induces leukemia cells into cell cycle arrest resistant to arabinosyl cytosine [7, 8]. As major components of the tumor microenvironment, tumor-associated macrophages and fibroblasts also secrete TGFβ1 to facilitate chemoresistance [9, 10]. Interestingly, Shen *et*

al. [11] reported that the autocrine TGFβ1 decreases the susceptibility of cisplatin-resistant lung cancer cells to natural killer cell cytotoxicity by upregulating programmed death-ligand 1 levels [11].

Forkhead box M1 (FOXM1) is a transcription factor characterized as a regulator of cell cycle progression, which is overexpressed in a large variety of human tumors [12]. Except for proliferation, FOXM1 regulates many aspects of tumor progression including metastasis, angiogenesis, and chemoresistance [13, 14]. In NSCLC, high FOXM1 expression has been detected in an invasive subgroup identified by poor prognosis, high incidence of metastases, and poor tumor differentiation [15]. In addition, the upregulation of FOXM1 also correlates with recurrence after NSCLC resection, resulting in shorter disease-free survival [16].

High-mobility group AT-hook 1 (HMGA1) is a chromatin architectural transcription factor that binds the minor groove of AT-rich DNA, thereby changing chromatin structure and facilitating the assembly of transcriptional complexes, consequently controlling the transcription of downstream effectors involved in several fundamental cellular processes such as differentiation, transformation, and apoptosis [17, 18]. Compared with normal cells and tissues, HMGA1 is abundant in malignant carcinomas including NSCLC [19], and its overexpression correlates with metastatic potential, drug resistance, and reduced survival in NSCLC patients [20, 21].

As the rate-limiting enzyme of the pentose phosphate pathway (PPP), glucose-6-phosphate dehydrogenase (G6PD) catalyzes the oxidation of G6P to 6-phosphogluconate leading to the production of nicotinamide adenine dinucleotide phosphate (NADPH). Elevated level and activity of G6PD usually appear during cancer development and progression, which are associated with resistance to therapy. Cancer cells overexpressing G6PD have shown high activity of the pentose phosphate pathway and increased resistance to multiple drugs including doxorubicin, cisplatin, oxaliplatin, and adriamycin [22-25]. Recently, Hong *et al.* [26] reported that inhibition of G6PD restored the cisplatin sensitivity of NSCLC cells by influencing redox homeostasis. Thus, understanding the dysregulation of G6PD may help overcome the resistance to current chemotherapy drugs.

In this study, it was demonstrated that TGFβ1 induced HMGA1 expression by increasing the stability of FOXM1 protein, thereby activating the transcription of G6PD, which was required for cisplatin resistance in NSCLC. In addition, the induction of TGFβ1 by HMGA1 suggested the existence of the TGFβ1-FOXM1-HMGA1-TGFβ1 positive feedback loop, which maintained G6PD levels and resistance to cisplatin. These findings reveal a novel regulatory pathway for G6PD as well as its role in chemoresistance.

Materials and methods

Cell culture and transfection

Human NSCLC cell lines, H1299, H226, Calu-3, H460 and A549, and the human lung epithelial cell line, BEAS-2B, were purchased from American Type Culture Collection (Manassas, VA, USA). All the cell lines were cultured in RPMI-1640 medium containing 10% fetal bovine serum (Gibco; Thermo Fisher Scientific, Inc., Waltham, MA, USA) in 5% CO_2 at 37°C. H1299 and H226 cells were treated with cisplatin (P4394; Sigma, St Louis, MO, USA) and recombinant human TGFβ1 (ab50036; Abcam, Cambridge, UK). Overexpression plasmids and small interfering RNAs (siRNAs) were transfected using Lipofectamine™ 3000 (Invitrogen; Thermo Fisher Scientific, Inc., Waltham, MA, USA) according to the manufacturer's instructions.

Plasmids, siRNAs, and antibodies

FOXM1, HMGA1, and G6PD overexpression plasmids were constructed based on pcDNA3.1. The siRNAs targeting FOXM1, HMGA1, and G6PD were synthesized from GenePharma (Shanghai, China). Antibodies against TGFβ1 (ab92486), HMGA1 (ab168260), and G6PD (ab210702) were purchased from Abcam. Antibodies against FOXM1 (sc-376471), Flag (OctA, sc-166355), Ku80 (sc-5280), and gamma H2A histone family member X (γ-H2AX) (sc-517348) were purchased from Santa Cruz (Santa Cruz, CA, USA).

Western blot

Western blot analysis was conducted according to our previous study [27]. Whole cell lysate was obtained using RIPA lysis buffer (Millipore, CA, USA) and then examined using the indicated antibodies. IRDye 800CW- or IRDye 680-

conjugated secondary antibodies (LI-COR Biosciences, Lincoln, NE, USA) were used for staining and proteins were detected using the Odyssey infrared imaging system (LI-COR) (Figure S1).

Quantitative real-time PCR

Total RNA was extracted using the RNAiso™ Plus reagent (Takara, Otsu, Japan) and reverse transcribed using a PrimeScript™ RT reagent kit (Takara). Quantitative PCR (qPCR) was performed with SYBR Green Mix (Takara) according to the manufacturer's instructions. β-actin served as the loading control. The sequences of the qPCR primers are listed in Table S1.

Immunofluorescence

Immunofluorescence was performed according to our previous study [27]. The slides were mounted and visualized by fluorescence microscope.

DNA pull-down assay

The DNA pull-down assay was performed according to our previous study [28]. Briefly, nuclear proteins were extracted from TGFβ1-treated or control H1299 cells. DNA probes of the HMGA1 promoter were obtained by PCR with the primers (one of which was labeled with biotin). The biotinylated DNA probes were pre-incubated with M-280 streptavidin Dynabeads (Invitrogen), and then the beads were added to the nuclear extracts and incubated. After washing, loading buffer was added to the precipitates, boiled, and separated on sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE). Proteins pulled down by the DNA probes were analyzed by silver stain, liquid chromatography-tandem mass spectrometry (LC-MS/MS), and immunoblotting.

RNA sequencing analysis

RNA sequencing (RNA-seq) was performed as previously described [27]. In brief, RNA from H1299 cells with or without HMGA1 knockdown was extracted and purified for quantification, RNA-seq library preparation, and sequencing. The libraries were sequenced on the Illumina HiSeq 2500 platform. The reads containing adapter or poly-N and reads of low quality were removed from raw data to generate clean reads for further analyses. Based on the clean reads, the Q20 (>90%), Q30 (>85%), and error rate (<0.1%) of the clean data were required. Then mapped reads were obtained by Tophat2 by aligning clean reads to the human genome reference (hg19). The number of mapped clean reads for each unigene was counted and normalized into reads/kb/million reads to calculate the expression level of the unigene.

G6PD activity, NADPH, and reactive oxygen species measurement

H1299 and H226 cells were seeded in six-well plates. Following transfection and treatment, G6PD activity, NADPH level, and reactive oxygen species (ROS) level were tested using the Glucose 6 Phosphate Dehydrogenase Assay Kit (ab102529; abcam), NADP/NADPH Assay Kit (ab65349; abcam), and ROS/Superoxide Detection Assay Kit (ab139476; abcam) according to each manufacturer's specifications. The optical density 450/490 was measured using an automatic plate reader.

Luciferase assay

The promoter region of human G6PD was amplified by PCR and inserted into the pGL3 vector. The reporter constructs containing various lengths of G6PD promoter or mutated AT-hooks were generated by subsequent PCR-based cloning. H1299 cells were plated in 24-well plates and then co-transfected with pGL3 constructs, pRL-SV40 plasmid, and HMGA1 overexpression plasmid or siRNA. After 48 h, luciferase activity was measured using a dual-luciferase reporter assay system (Promega, Madison, WI, USA) and a luminometer (LB 9507; Berthold, BadWildbad, Germany).

Chromatin immunoprecipitation

The chromatin immunoprecipitation (ChIP) was performed according to our previous study [27]. Briefly, chromatin was crosslinked using 1% formaldehyde and sonicated to obtain DNA fragments of 200-500 base pairs. After centrifugation, the supernatants were subjected to immunoprecipitation overnight with antibodies against HMGA1 (ab168260). Protein A/G PLUS-Agarose (sc-2003; Santa Cruz) was used to isolate the chromatin-antibody complexes. The crosslinking was reversed, and the precipitated DNA fragments were purified and analyzed by qPCR and agarose gel with the primers (G6PD promoter) listed in Table S1.

Cell viability assay

H1299 and H226 cells in logarithmic growth were plated and then transfected or treated. After the indicated times of culture, cell viability was determined using the Cell Counting Kit-8 (Dojindo Molecular Technologies, Rockville, MD, USA), and the optical density at 450 nm was measured using an automatic plate reader.

Immunohistochemistry

In total, 94 NSCLC cases were from the National Human Genetic Resources Sharing Service Platform (HLugA180Su06; Tianjin, China); 58 NSCLC cases were from Chinese and Western Combined Hospital of Taizhou (Zhejiang Sheng, China) and 64 NSCLC cases were from Sanmen People's Hospital of Zhejiang (Sanmen, China). Of the 216 cases, 205 had a survival time. Informed consent was obtained from all patients. The study was approved by the Ethics Committee of Chinese and Western Combined Hospital of Taizhou, the Ethics Committee of Sanmen People's Hospital of Zhejiang, and Shanghai Outdo Biotech Company (Shanghai, China). Immunohistochemistry was performed and analyzed as previously described [27].

Statistical analysis

Statistical analysis was performed with SPSS (version 22.0) and GraphPad Prism (version 5.0). Analysis of differences was performed using the two-tailed Student's *t*-test or analysis of variance (one-way with Tukey's *post hoc* test; two-way with Sidak's *post hoc* test). The results are presented as the mean ± standard deviation of three separate experiments. χ^2 test or Fisher's exact probability test was used to compare the clinicopathological features of patients with protein expression. The Spearman's rank correlation test was used for analyzing the correlation. Kaplan-Meier plots and log-rank tests were used for survival analysis. $P<0.05$ was considered statistically significant.

Results

TGFβ1 indicates a poor prognosis and induces the expression of HMGA1 in NSCLC

The link between TGFβ1 and HMGA1 has been established in breast and thyroid cancer [29, 30]. To verify the relationship in lung cancer, immunohistochemical analyses of NSCLC tissues from 216 cases was performed. The representative images in **Figure 1A**, **1B** showed that cases with high TGFβ1 expression had stronger HMGA1 staining than those with low expression, and statistical analysis of IHC positively correlated the expression levels of TGFβ1 with the degree of HMGA1. In addition, for 205 cases with survival time, it was noticed that overall survival (OS) was worse in patients with high TGFβ1 staining than in those with low staining (**Figure 1C**). Furthermore, we analyzed the link between TGFβ1 and HMGA1 in NSCLC cells. The results showed that the expression levels of TGFβ1 paralleled those of HMGA1 in different NSCLC cell lines, and higher levels of TGFβ1 and HMGA1 were detected in the NSCLC cell lines compared with the lung epithelial cell line (**Figure 1D**). Exogenous TGFβ1 treatment increased the mRNA and protein levels of HMGA1 in H1299 and H226 cells, while neutralizing TGFβ1 in culture medium with a specific antibody inhibited the expression of HMGA1 (**Figure 1E-G**). These results support the TGFβ1-mediated regulation of HMGA1 in NSCLC cells.

Increased stabilization of FOXM1 by deubiquitination promotes the transcription of HMGA1 in response to TGFβ1 stimulation

To understand the mechanisms responsible for the regulation of HMGA1 expression by TGFβ1, we examined the transcriptional activities of deletion constructs from HMGA1 promoter after TGFβ1 treatment. It was shown that the HMGA1 promoter lacking the region between -3000 and -2000 lost the ability to respond to TGFβ1 (**Figure 2A**). Then, DNA pull-down assays with biotin-labeled HMGA1 promoter probe (-3000/-2000) were performed. The protein complexes were captured by the DNA probe from nuclear extracts of H1299 cells with TGFβ1 stimulation or not. The captured proteins were analyzed by silver staining, and the different bands between TGFβ1 treatment and control groups were cut off to identify the components by LC-MS/MS spectrometry (**Figure 2B**). The most significantly enriched proteins in the TGFβ1 treatment group are shown in **Figure 2C**. Next, we determined whether FOXM1 mediated the TGFβ1-induced expression of HMGA1. A putative binding site for FOXM1 (-2069/-2061) was predicted at the HMGA1 promoter, and DNA pull-down assays coupled with western blot analysis showed that the binding of FOXM1 to the wild-

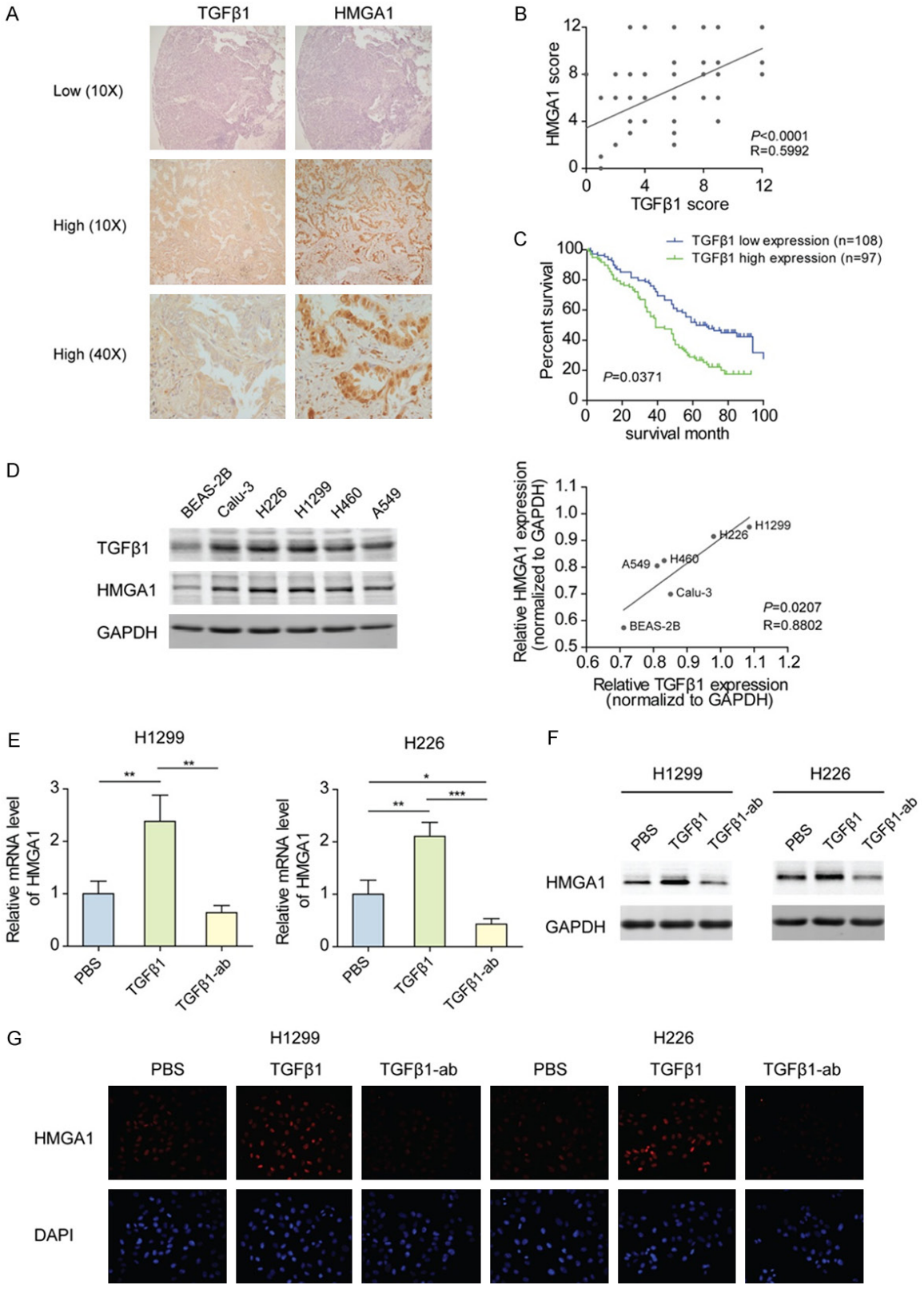
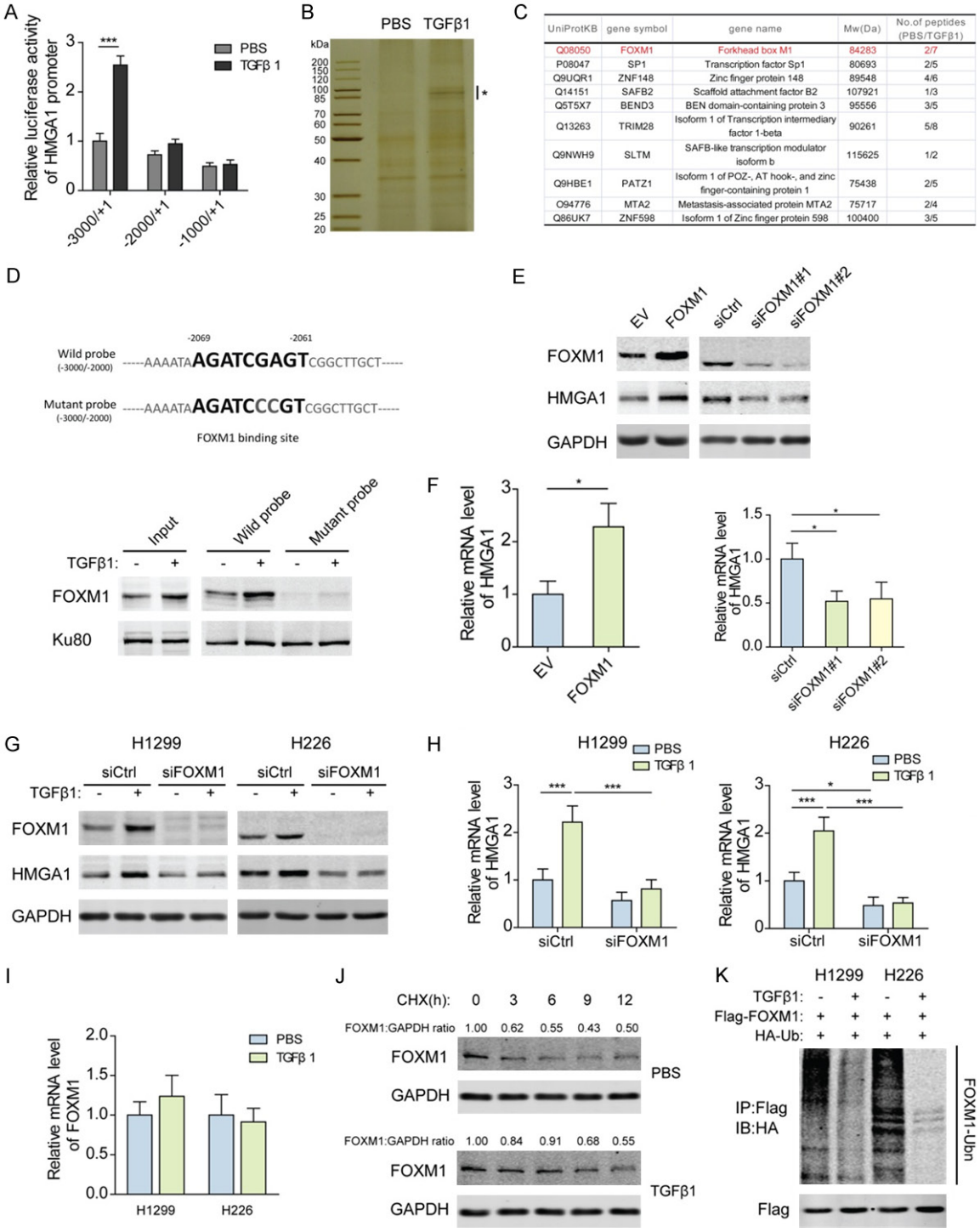


Figure 1. TGFβ1 indicates a poor prognosis and induces the expression of HMGA1 in NSCLC. (A) Representative image of TGFβ1 and HMGA1 immunostaining in NSCLC tissues from two cases, showing the low or high expression of TGFβ1 and HMGA1. (B) Correlation between concurrent immunostaining scores of TGFβ1 and HMGA1 in NSCLC tissues from 216 cases. (C) OS of 205 NSCLC patients with low and high expression of TGFβ1. (D) Left panel: Western blot analyses of TGFβ1 and HMGA1 in BEAS-2B, Calu-3, H226, H1299, H460, and A549 cells. Right panel:

Band density in the left panel was calculated by Image J software. Based on the relative expression (density$^{TGFβ1\ or\ HMGA1}$/density^{GAPDH}), the correlation between TGFβ1 and HMGA1 in human lung epithelial and NSCLC cell lines was analyzed. (E) The mRNA level of HMGA1 in H1299 and H226 cells treated with 10 ng/mL TGFβ1 or 100 ng/mL TGFβ1 antibody for 48 h was analyzed by qPCR. *P<0.05, **P<0.01, ***P<0.001. (F) The protein level of HMGA1 in H1299 and H226 cells treated as described in (E) was analyzed by western blotting. (G) Immunofluorescence analysis of HMGA1 protein in H1299 and H226 cells treated as described in (E).



UniProtKB	gene symbol	gene name	Mw(Da)	No.of peptides (PBS/TGFβ1)
Q08050	FOXM1	Forkhead box M1	84283	2/7
P08047	SP1	Transcription factor Sp1	80693	2/5
Q9UQR1	ZNF148	Zinc finger protein 148	89548	4/6
Q14151	SAFB2	Scaffold attachment factor B2	107921	1/3
Q5T5X7	BEND3	BEN domain-containing protein 3	95556	3/5
Q13263	TRIM28	Isoform 1 of Transcription intermediary factor 1-beta	90261	5/8
Q9NWH9	SLTM	SAFB-like transcription modulator isoform b	115625	1/2
Q9HBE1	PATZ1	Isoform 1 of POZ-, AT hook-, and zinc finger-containing protein 1	75438	2/5
O94776	MTA2	Metastasis-associated protein MTA2	75717	2/4
Q86UK7	ZNF598	Isoform 1 of Zinc finger protein 598	100400	3/5

Figure 2. Increased stabilization of FOXM1 by deubiquitination promotes the transcription of HMGA1 in response to TGFβ1 stimulation. (A) Transcription activity of the truncated HMGA1 promoter sequences after 10 ng/mL TGFβ1 treatment for 48 h as measured by luciferase reporter assays in H1299 cells. ***P<0.001. (B) Nuclear proteins

extracted from H1299 cells exposed to 10 ng/mL TGFβ1 for 48 h were pulled down by a biotin-labeled HMGA1 promoter (-3000/-2000) DNA probe, separated with 10% SDS-PAGE, and analyzed after silver staining. *Indicates the different bands between TGFβ1 treatment and control groups. (C) The different bands from (B) were cut off to identify the components by LC-MS/MS spectrometry. The most significantly enriched proteins in TGFβ1 treatment group are shown. (D) A putative binding site for FOXM1 was predicted at -2069/-2061 of HMGA1 promoter. H1299 cells were exposed to 10 ng/mL TGFβ1 for 48 h, and the binding of FOXM1 to the wild-type HMGA1 promoter probe (-3000/-2000) or the probe with mutant FOXM1 binding site was assessed by DNA pull-down assays coupled with western blot analysis. Ku80 served as a control. (E) Protein level of HMGA1 in H1299 cells transfected with FOXM1 overexpression plasmids or siRNAs for 48 h was analyzed by western blotting. (F) The mRNA level of HMGA1 in H1299 cells transfected as described in (E) was analyzed by qPCR. *P<0.05. (G) Protein levels of FOXM1 and HMGA1 in H1299 and H226 cells transfected with FOXM1 siRNAs and treated with 10 ng/mL TGFβ1 for 48 h were analyzed by western blotting. (H) The mRNA levels of FOXM1 and HMGA1 in H1299 and H226 cells transfected as described in (G) were analyzed by qPCR. *P<0.05, ***P<0.001. (I) The mRNA levels of FOXM1 in H1299 and H226 cells treated with 10 ng/mL TGFβ1 for 48 h were analyzed by qPCR. (J) Western blot analyses of FOXM1 in TGFβ1-treated or control H1299 cells pretreated for 15 min with 20 mmol/L cycloheximide. (K) HA-ubiquitin and Flag-tagged FoxM1 plasmids were transfected into H1299 cells. After exposure to 10 ng/mL TGFβ1 for 12 h, cells were treated with 25 nM MG132 for 6 h. Cell lysates were subjected to immunoprecipitation with anti-Flag antibody, followed by immunoblotting with anti-Flag and anti-HA antibody.

type HMGA1 promoter probe was markedly enhanced by TGFβ1 exposure, while FOXM1 did not interact with the probe containing the mutant FOXM1 binding site (**Figure 2D**). Furthermore, it was found that overexpression of FOXM1 upregulated the mRNA and protein levels of HMGA1 in H1299 cells and knockdown of FOXM1 downregulated expression (**Figure 2E**, **2F**). Additionally, silencing FOXM1 impaired the induction of HMGA1 that arose from TGFβ1 treatment (**Figure 2G**, **2H**). These results indicate the crucial role of FOXM1 in the regulation of HMGA1 by TGFβ1. Considering the increased level of FOXM1 protein after TGFβ1 treatment (**Figure 2D**), we next studied the effect of TGFβ1 on FOXM1 expression. However, no significant change of FOXM1 mRNA level was detected in both H1299 and H226 cells (**Figure 2I**). Further investigations showed that TGFβ1 stimulation dramatically increased the half-life of FOXM1, measured by a CHX-chase assay (**Figure 2J**). To determine whether the ubiquitin proteasome pathway is involved in TGFβ1-mediated FOXM1 stability, we analyzed the ubiquitination of FOXM1 protein and found that FOXM1 had a lower ubiquitination level in TGFβ1-treated cells than in control cells (**Figure 2K**). Together, these findings indicate that TGFβ1 induces the deubiquitination of FOXM1 protein and enhances its stability, thereby transactivating HMGA1.

HMGA1 is required for the expression of G6PD and TGFβ1 in NSCLC

To identify the target genes of HMGA1 in NSCLC, RNA-seq was performed to profile the transcriptome changes after knocking down HMGA1 in H1299 cells. In total, 1152 genes with significantly differential expression (P< 0.05) were obtained following HMGA1 knockdown. Among these genes, 439 were upregulated and 713 were downregulated (**Figure 3A**; Table S2). The differentially expressed genes (DEGs) with >2-fold change were represented in the heatmap (**Figure 3B**), among which G6PD and TGFβ1 had a 0.37-fold and 0.46-fold decrease, respectively. To confirm these findings, we modified the expression of HMGA1 in H1299 and H226 cells. The results showed that ectopic expression of HMGA1 markedly increased TGFβ1 and G6PD at the mRNA and protein levels, while TGFβ1 and G6PD were downregulated following knockdown of HMGA1 (**Figure 3C**, **3D**, **3F**, **3G**), and evident accumulation of G6PD around the nucleus was observed after overexpressing HMGA1 (**Figure 3F**). Importantly, the secretion of TGFβ1 was consequently induced by HMGA1, as indicated by the TGFβ1 concentration in culture medium, suggesting a positive feedback between HMGA1 and TGFβ1 (**Figure 3E**). Because G6PD functions as the central regulator of PPP, we also examined the enzymatic activity of G6PD and the level of NADPH, an important antioxidant produced by G6PD. Consistent with G6PD expression, overexpressed HMGA1 enhanced the enzymatic activity of G6PD and promoted the production of NADPH, and knockdown of HMGA1 suppressed them (**Figure 3H**, **3I**). These results demonstrate that HMGA1 regulates the expression of G6PD and TGFβ1 in NSCLC cells.

TGFβ1-induced HMGA1 directly activates the transcription of G6PD

Based on the aforementioned results, it was determined whether HMGA1 directly activates the transcription of G6PD. The 2 kb region

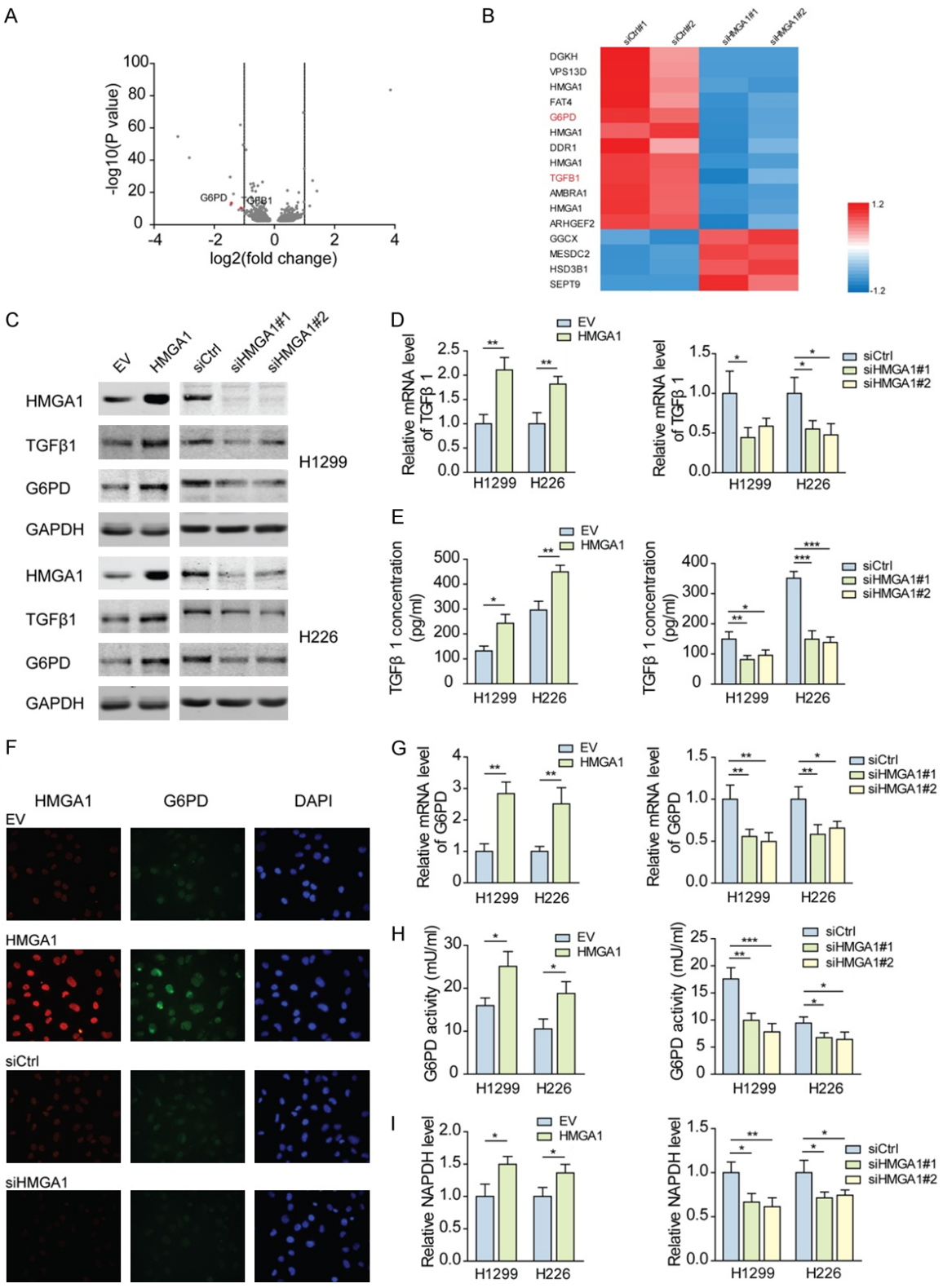


Figure 3. HMGA1 is required for the expression of G6PD and TGFβ1 in NSCLC. (A) Total number of genes with significant change in gene expression ($P<0.05$). 439 genes were upregulated and 713 genes were downregulated in H1299 cells transfected with HMGA1 siRNAs for 48 h, compared with the control. The differentially expressed genes were shown in volcano plots. (B) Heatmap of significantly differentially expressed genes (>2 fold) in HMGA1-silenced group versus control group. The fold change (fc) was normalized using $(fc\text{-}mean^{row})/SD^{row}$. (C) Protein levels of TGFβ1 and G6PD in H1299 and H226 cells transfected with HMGA1 overexpression plasmids or siRNAs for

48 h were analyzed by western blotting. (D) The mRNA levels of TGFβ1 in H1299 and H226 cells transfected as described in (C) were analyzed by qPCR. *P<0.05, **P<0.01. (E) The concentrations of TGFβ1 secreted by H1299 and H226 cells transfected as described in (C) were analyzed by enzyme-linked immunoassay. *P<0.05, **P<0.01, ***P<0.001. (F) Immunofluorescence analysis of G6PD protein in H1299 cells transfected as described in (C). (G) The mRNA levels of G6PD in H1299 and H226 cells transfected as described in (C) were analyzed by qPCR. *P<0.05, **P<0.01. (H) The enzymatic activity of G6PD was measured in H1299 and H226 cells transfected as described in (C). *P<0.05, **P<0.01, ***P<0.001. (I) NADPH level was measured in H1299 and H226 cells transfected as described in (C). *P<0.05, **P<0.01.

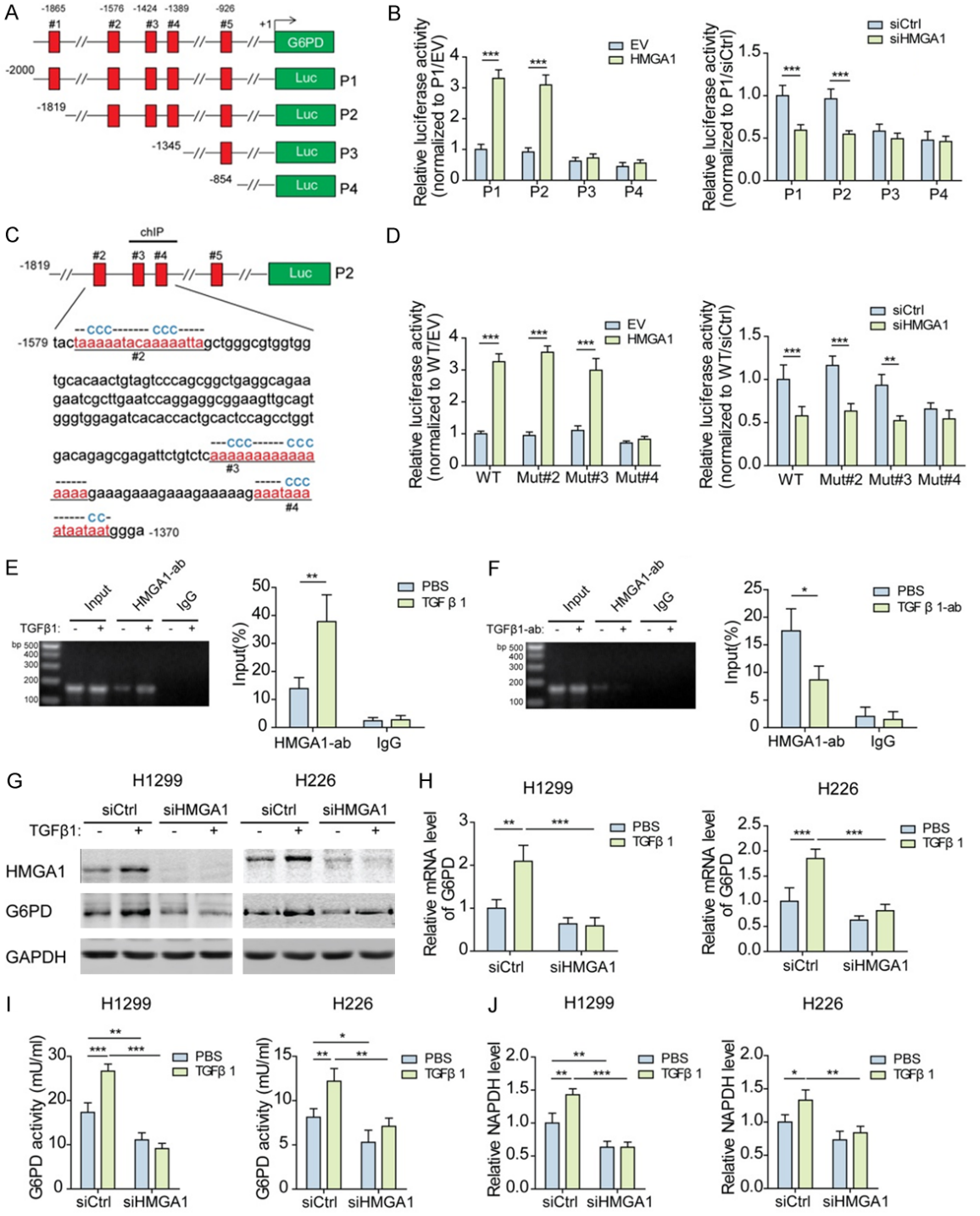


Figure 4. TGFβ1-induced HMGA1 directly activates the transcription of G6PD. (A) Schematic of the truncated G6PD promoter sequence with potential HMGA1 binding sites indicated by red rectangle. (B) Transcription activity of the truncated G6PD promoter sequences was measured by luciferase reporter assays in H1299 cells transfected with HMGA1 overexpression plasmids or siRNAs for 48 h. ***P<0.001. (C) The potential AT-hook sequences for HMGA1 binding were mutated as indicated. (D) Transcription activity of the wild-type or mutated G6PD promoter sequences was measured by luciferase reporter assays in H1299 cells transfected as described in (B). **P<0.01, ***P<0.001. (E) The binding of HMGA1 protein to G6PD promoter was detected by ChIP-PCR in H1299 cells treated with 10 ng/ml TGFβ1 for 48 h. **P<0.01. (F) The binding of HMGA1 protein to G6PD promoter was detected by ChIP-PCR in H1299 cells treated with 100 ng/mL TGFβ1 antibody for 48 h. *P<0.05. (G) The protein levels of HMGA1 and G6PD in H1299 and H226 cells transfected with HMGA1 siRNAs and treated with 10 ng/mL TGFβ1 for 48 h were analyzed by western blotting. (H) The mRNA levels of G6PD in H1299 and H226 cells transfected and treated as described in (G) were analyzed by qPCR. **P<0.01, ***P<0.001. (I) The enzymatic activity of G6PD was measured in H1299 and H226 cells transfected and treated as described in (G). *P<0.01, **P<0.01, ***P<0.001. (J) NADPH level was measured in H1299 and H226 cells transfected and treated as described in (G). *P<0.01, **P<0.01, ***P<0.001.

upstream of G6PD transcription start site was searched for putative HMGA1-binding sites. Serial deletion constructs of the promoter region were examined using luciferase reporter assays to identify the elements responsive to HMGA1 in NSCLC cells (**Figure 4A**). Activity of the full-length promoter was increased by HMGA1 overexpression and decreased by HMGA1 knockdown, but the promoter lacking the region between -1819 and -1345 was irresponsive to HMGA1 (**Figure 4B**). Around this region, three AT-rich sequences predicted to be bound by HMGA1 were identified (**Figure 4C**). Only the reporter activity of G6PD promoter with mutated #4 site was not affected by HMGA1 (**Figure 4D**). ChIP data also confirmed that HMGA1 directly bound to the G6PD promoter close to the #4 site. Notably, TGFβ1 stimulation strengthened the binding of HMGA1 to the G6PD promoter, while neutralizing TGFβ1 by specific antibody undermined the binding (**Figure 4E**, **4F**). Because HMGA1 directly regulates the transcription of G6PD, it was necessary to confirm whether TGFβ1 induces the expression of G6PD via HMGA1. As shown in **Figure 4G**, **4H**, exogenous TGFβ1 upregulated the mRNA and protein levels of G6PD, and as expected, the upregulation of G6PD was inhibited in HMGA1-silenced NSCLC cells. Similarly, TGFβ1 increased the enzymatic activity of G6PD and NADPH level in NSCLC cells, whereas knocking down HMGA1 attenuated the effect of TGFβ1 on G6PD and NADPH (**Figure 4I**, **4J**). Thus it can be concluded that the induction of G6PD by TGFβ1 depends on HMGA1-mediated transcriptional regulation.

The TGFβ1-FOXM1-HMGA1-G6PD axis enhances the cisplatin resistance of NSCLC cells

Considering the crucial role of G6PD in chemoresistance, we analyzed the cisplatin resistance of NSCLC cells after activating or blocking the TGFβ1-FOXM1-HMGA1-G6PD axis. Cell viability assays showed that, compared with parental cells, TGFβ1-treated H1299 and H226 cells exhibited increased resistance to cisplatin, with resistance indexes of 1.56 or 1.76, respectively (**Figure 5A**). However, blocking the TGFβ1-FOXM1-HMGA1-G6PD axis by knocking down FOXM1, HMGA1, or G6PD individually impaired TGFβ1-induced cisplatin resistance in both H1299 and H226 cells (**Figure 5B**). Highly expressed G6PD enhances the supplies of NADPH and ribose for detoxifying ROS and repairing DNA damage that is elevated by chemotherapy agents. Hence, we measured the levels of ROS and γ-H2AX, an indicator for DNA damage, in NSCLC cells. The results showed that cisplatin increased ROS levels in NSCLC cells, while cisplatin-induced ROS decreased when exogenous TGFβ1 was added (**Figure 5C**). Additionally, silencing FOXM1, HMGA1, or G6PD prevented TGFβ1 from eliminating ROS in cisplatin-treated cells (**Figure 5D**). In line with the above findings, γ-H2AX formation caused by cisplatin was reversed by exogenous TGFβ1, meanwhile silencing of FOXM1, HMGA1, or G6PD resulted in the significant accumulation of γ-H2AX (**Figure 5E**). These data indicate that G6PD expression upregulated by the TGFβ1-FOXM1-HMGA1 pathway may lead to cisplatin resistance in NSCLC cells.

Ectopic activation of the FOXM1-HMGA1-G6PD regulatory axis indicates a poor prognosis in NSCLC patients

To characterize the expression of FOXM1, HMGA1, and G6PD in NSCLC, immunohistochemical analysis in 216 NSCLC patients was performed. As shown in **Figure 6A**, different levels of FOXM1, HMGA1, and G6PD were detected in the NSCLC tissues from different

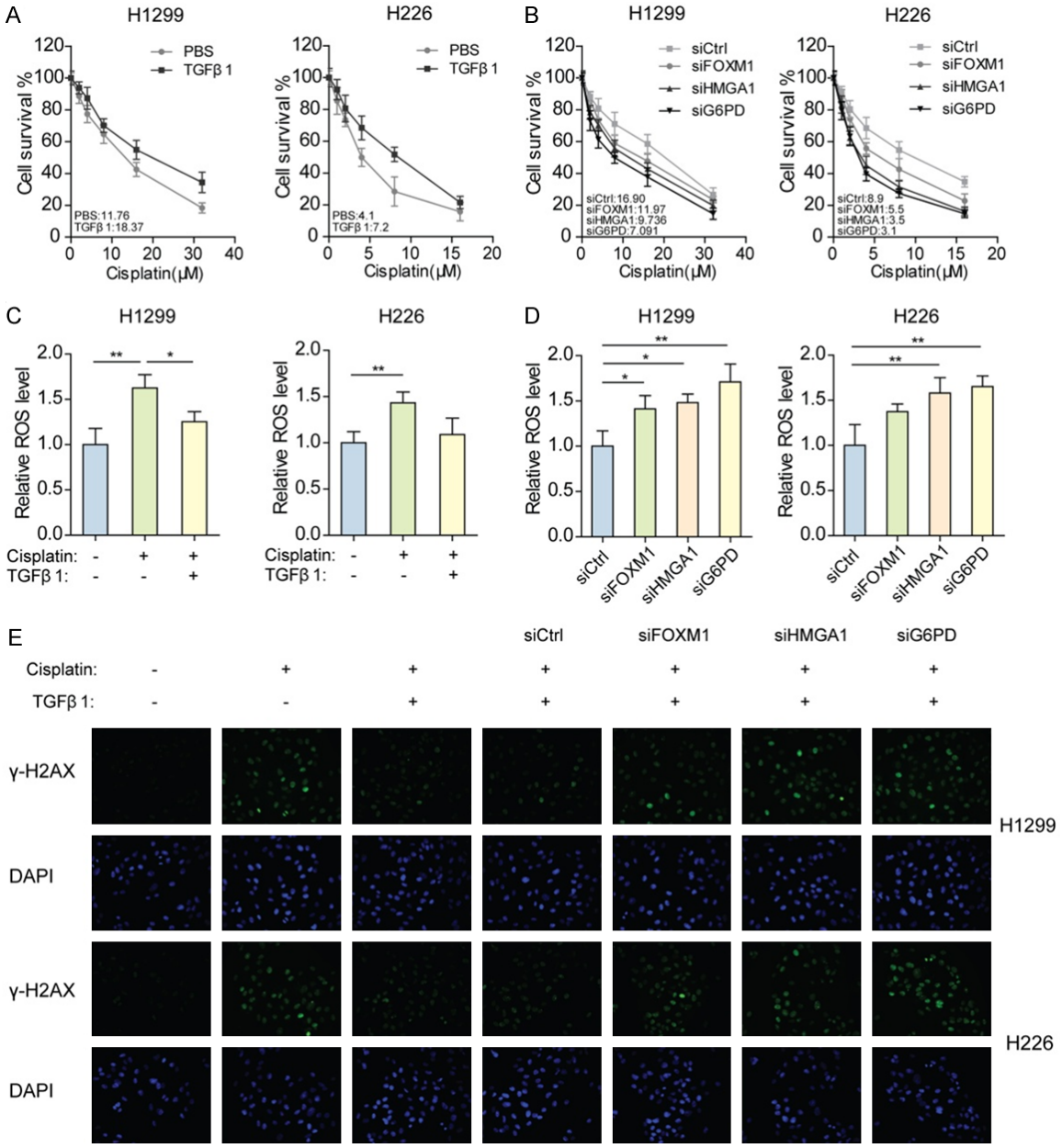


Figure 5. The TGFβ1-FOXM1-HMGA1-G6PD axis enhances the cisplatin resistance of NSCLC cells. A. Cell viability was measured in H1299 and H226 cells pre-exposed to 10 ng/mL TGFβ1 for 24 h, when treated with various concentrations of cisplatin for 48 h. B. Cell viability was measured in H1299 and H226 cells pre-exposed to 10 ng/mL TGFβ1 and pre-transfected with FOXM1, HMGA1, or G6PD siRNAs for 24 h, when treated with various concentrations of cisplatin for 48 h. C. ROS level was measured in H1299 and H226 cells pre-exposed to 10 ng/mL TGFβ1 for 24 h, when treated with 3 μM (H1299) or 1.5 μM (H226) cisplatin for 48 h. **P*<0.01, ***P*<0.01. D. ROS levels were measured in H1299 and H226 cells pre-exposed to 10 ng/mL TGFβ1 and pre-transfected with FOXM1, HMGA1, or G6PD siRNAs for 24 h, when treated with 3 μM (H1299) or 1.5 μM (H226) cisplatin for 48 h. **P*<0.01, ***P*<0.01. E. Immunofluorescence analysis of γ-H2AX protein in H1299 and H226 cells pre-exposed to 10 ng/mL TGFβ1 or pre-transfected with FOXM1, HMGA1, or G6PD siRNAs for 24 h, when treated with 3 μM (H1299) or 1.5 μM (H226) cisplatin for 48 h.

patients. FOXM1 and HMGA1 immunostaining was detected in the nucleus, while G6PD was found to be distributed in the cytoplasm. The representative images showed a case with low expression of FOXM1, HMGA1 and G6PD as well as another case with high expression of the three factors, which were the most common in the immunohistochemical analysis. Statistical results indicated positive correlations among the expression levels of FO-

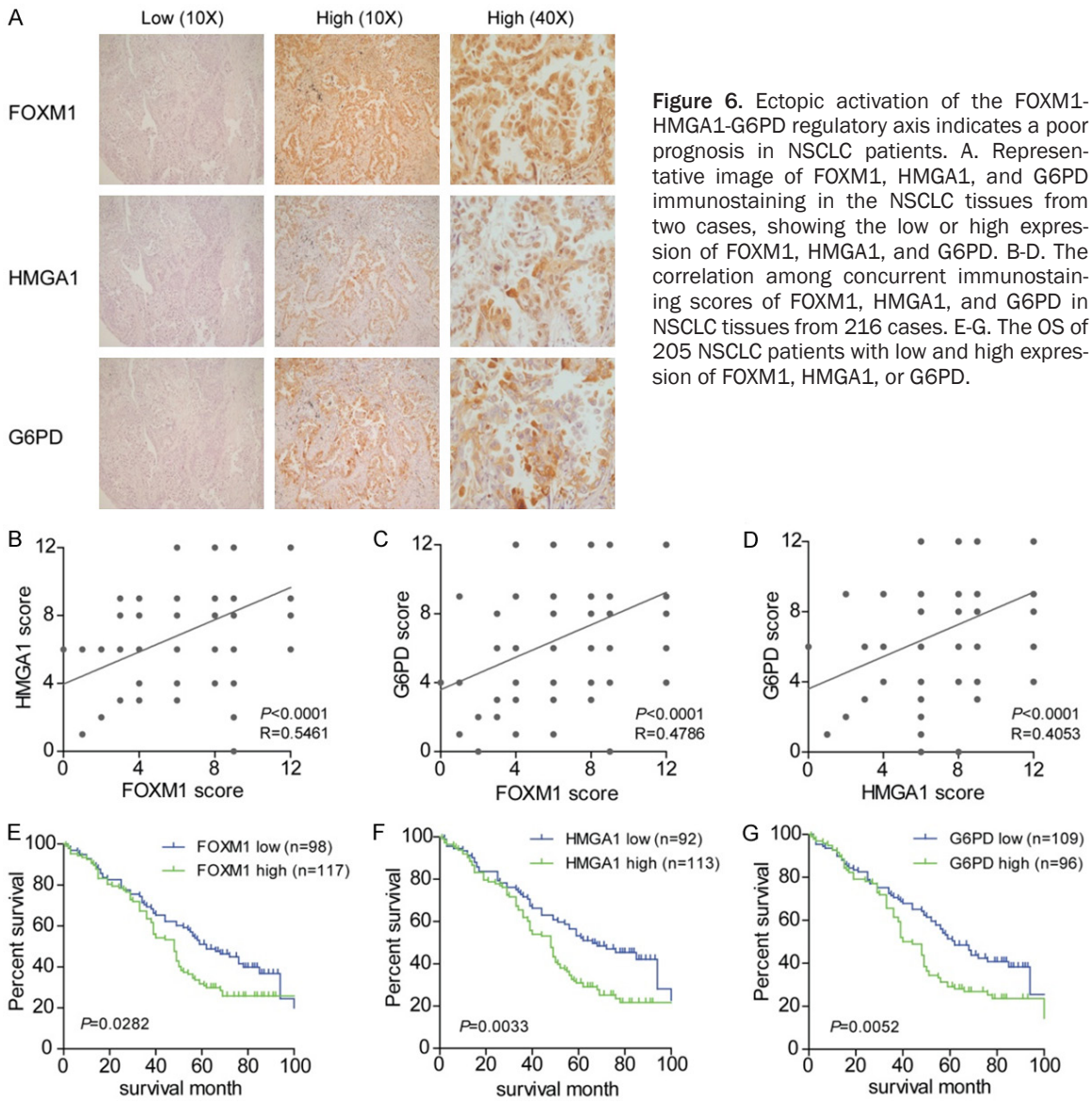


Figure 6. Ectopic activation of the FOXM1-HMGA1-G6PD regulatory axis indicates a poor prognosis in NSCLC patients. A. Representative image of FOXM1, HMGA1, and G6PD immunostaining in the NSCLC tissues from two cases, showing the low or high expression of FOXM1, HMGA1, and G6PD. B-D. The correlation among concurrent immunostaining scores of FOXM1, HMGA1, and G6PD in NSCLC tissues from 216 cases. E-G. The OS of 205 NSCLC patients with low and high expression of FOXM1, HMGA1, or G6PD.

XM1, HMGA1, and G6PD in NSCLC tissues (**Figure 6B-D**). Clinical relevance analysis showed that all factors of the TGFβ1-FOXM1-HMGA1-G6PD axis were positively correlated with tumor-node-metastasis (TNM) stage (**Table 1**). Moreover, only TGFβ1 was positively associated with Lymph node metastasis and G6PD positively correlated with tumor size. The potential associations between immunostaining and OS were retrospectively evaluated in 205 NSCLC patients. Kaplan-Meier analysis showed that OS was worse among patients with high FOXM1, HMGA1, or G6PD staining than among those with low staining (**Figure 6E-G**). These results suggest that the TGFβ1-activated FOXM1-HMGA1-G6PD pathway is involved in NSCLC progression and metastasis.

Discussion

TGFβ1 is a cytokine with a paradoxical role in that it behaves as a tumor suppressor in precancerous or early cancerous tissue, while leading to tumor invasiveness and metastasis during the late stages of cancer progression when TGFβ1 growth inhibitory signals are lost. As a constituent of resistance progression in the principal non-surgical interventions in lung cancer, TGFβ1 has been highlighted in different mechanisms that mediate resistance to cytotoxic chemotherapy. Induction of the EMT, pro-

Table 1. Correlation of the expression of TGFβ1, HMGA1, FOXM1, and G6PD with clinicopathological features in NSCLC

	Cases	TGFB1 expression		*P* Value	HMGA1 expression		*P* Value	FOXM1 expression		*P* Value	G6PD expression		*P* Value
		Low Cases	High Cases		Low Cases	High Cases		Low Cases	High Cases		Low Cases	High Cases	
Gender	216	116	100	0.9728	99	117	0.6228	105	111	0.7566	114	102	0.1251
Male	137	73	64		63	74		66	71		68	69	
Female	79	43	36		36	43		39	40		46	33	
Age				0.3655			0.9277			0.1216			0.0528
<57	55	33	22		31	25		36	20		36	20	
≥57	161	83	78		68	92		69	91		78	82	
Tumor size				0.3614			0.3841			0.2096			0.019*
≤3 cm	85	49	36		43	42		49	36		53	32	
>3 cm	131	67	64		56	75		56	75		61	70	
Histological type				0.0533			0.0726			0.4402			0.1207
Squamous cell carcinoma	74	41	33		34	40		34	40		31	43	
Adenocarcinoma	113	66	47		57	56		61	52		68	45	
Mixed/other	29	9	20		8	21		10	19		15	14	
Lymph node metastasis				0.0141*			0.0571			0.0563			0.3218
No	80	53	27		46	34		46	34		48	32	
Yes	136	63	73		53	83		59	77		66	70	
Differentiation status				0.0979			0.5694			0.3117			0.6339
Well	70	41	29		36	34		38	32		39	31	
Moderate	74	32	42		30	44		37	37		39	35	
Poor	72	43	29		33	39		30	42		36	36	
TNM stage				0.0187*			0.0119*			0.0200*			0.0015*
I/II	130	79	51		67	63		72	58		81	49	
III/IV	86	37	49		32	54		33	53		33	53	

*$P<0.05$

motion of drug efflux receptor expression, protection from cytotoxic therapy-induced apoptosis, and recruitment of a pro-tumor stromal niche leads to TGFβ1-drived chemoresistance in lung cancer [31]. In this study, we found that TGFβ1 promoted resistance to cytotoxic chemotherapy by altering metabolism in NSCLC cells, and the PPP was activated through the TGFβ1-FOXM1-HMGA1-G6PD regulatory axis. Thus, the link between microenvironment and abnormal metabolism in cancer progression may display a crucial role in chemoresistance.

Recent evidence has implicated that FOXM1 is dispensable in many aspects of the DNA damage response. Accordingly, FOXM1 drives the transcription of DNA damage sensors, mediators, signal transducers and effectors, playing an integral part in chemoresistance by maintaining genome integrity [14]. Knockdown of FOXM1 enhanced the cytotoxic and pro-apoptotic effects of docetaxel in NSCLC cells by inducing activation of the c-Jun N-terminal kinases/mitochondrial signaling pathway, and this mechanism was also found in cisplatin-induced NSCLC cell apoptosis when downregulating FOXM1 [32, 33]. Consistently, clinical analysis has shown that NSCLC patients with high FOXM1 expression have a significantly lower response rate for cisplatin-based combination chemotherapy [34]. In this study, we found that FOXM1 mediated TGFβ1-induced cisplatin resistance in NSCLC cells by activating the downstream pathway HMGA1/G6PD. Recent evidence has indicated FOXM1 deregulation in the development of chemoresistance, showing that the imbalance between FOXO3 and FOXM1 plays a key role [35]. Here, we found that TGFβ1 enhanced the stability of FOXM1 protein by inhibiting its ubiquitination. Similarly, ubiquitination and degradation of FOXM1 were also suppressed in breast cancer with epirubicin resistance [36]. Although TGFβ1 was confirmed to repress degradation of FOXM1 in NSCLC, the regulation of FOXM1 protein by the TGFβ1 receptor was not studied in the present work.

HMGA1 overexpression is often associated with antineoplastic drug resistance. In this study, TGFβ1-induced FOXM1 was found to promote the expression of HMGA1 by directly activating its transcription. Knockdown of HMGA1 restored TGFβ1-impaired sensitivity to cisplatin in NSCLC cells, meanwhile ROS levels were upregulated and DNA damage was aggravated. Consistently, aberrant expression of HMGA1 facilitated cisplatin resistance in bladder cancer [37]. Interestingly, HMGA1 also induced TGFβ1 expression at the mRNA, protein, and secretion levels. Although whether HMGA1 directly activates the transcription of TGFβ1 was not determined in the present work, secreted TGFβ1 in turn drove FOXM1-HMGA1-G6PD axis to establish a positive feedback loop, thus maintaining the resistance to cisplatin. Addition of antibody against TGFβ1 into culture medium blocked the positive feedback loop, as indicated by the evident decrease in HMGA1.

With the exception of TGFβ1, G6PD was identified as another target of HMGA1, which functioned as an effector during chemoresistance progression. Silencing G6PD obviously promoted the accumulation of ROS and DNA damage caused by cisplatin. Consistently, Hong *et al.* [26] reported that cisplatin-resistant A549 cells exhibited increased levels of G6PD protein, G6PD enzymatic activity, NADPH, and glutathione. G6PD inhibition effectively induced apoptosis and more ROS accumulation after cisplatin exposure. In this study, the enzymatic activity and protein level of G6PD changed coordinately when the TGFβ1-FOXM1-HMGA1 pathway was activated or disrupted, suggesting that upregulation of enzymatic activity may result from the increased expression of G6PD. Previous studies have demonstrated that G6PD is highly regulated at multiple levels including transcription, translation, posttranslation, and intracellular location [38]. Here, localization of G6PD protein around the nucleus was observed especially after HMGA1 overexpression, as shown by immunofluorescence, which may facilitate the function of G6PD. In addition, whether posttranslational modification of G6PD is involved in TGFβ1-induced chemoresistance of NSCLC should be validated in the future. Interestingly, cisplatin-resistant cells exhibit increased glucose uptake and consumption, which further supports activation of the PPP [39].

Clinical analysis has shown that the high expression of TGFβ1, FOXM1, HMGA1, or G6PD indicates the short survival of NSCLC patients and is associated with TNM stage, revealing that the TGFβ1-FOXM1-HMGA1-G6PD axis

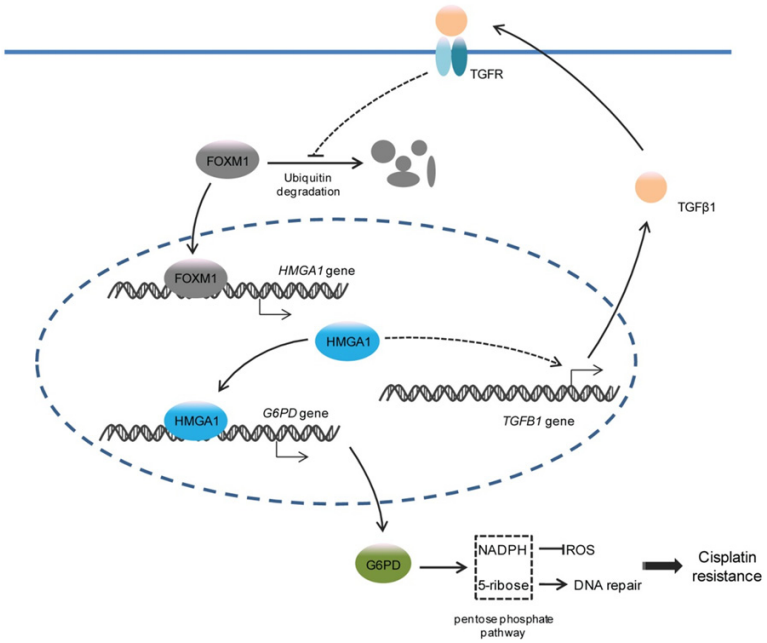


Figure 7. Schema indicating the role of TGFβ1-FOXM1-HMGA1-G6PD axis in cisplatin resistance of NSCLC. TGFβ1 stimulation prevents the ubiquitination and degradation of FOXM1 protein, a transcription factor for HMGA1 gene, thereby activating the transcription of HMGA1. Upregulated HMGA1 further activates the transcription of G6PD to promote the PPP, which supplies NADPH and dNTP against the ROS and DNA damage caused by cisplatin. Moreover, HMGA1 induces the production and secretion of TGFβ1, which in turn enhances TGFβ1 signaling to maintain G6PD expression and chemoresistance.

accelerated NSCLC progression. However, only TGFβ1 was positively correlated with lymph node metastasis, and this was likely due to TGFβ1-induced EMT. Additionally, G6PD but not other factors was positively correlated with tumor size, most likely due to G6PD promotion of cell proliferation. Therefore, the TGFβ1-FOXM1-HMGA1-G6PD axis not only enhances chemoresistance but may affect other malignant phenotypes of NSCLC.

In summary, our findings reveal the existence of the TGFβ1-FOXM1-HMGA1-G6PD axis and its role in the cisplatin resistance of NSCLC. Deubiquitination-induced TGFβ1 signaling increased the stability of FOXM1 protein, which transactivated HMGA1. Furthermore, highly expressed HMGA1 activated the transcription of G6PD and then accelerated the PPP to provide NADPH and dNTP for antagonizing cisplatin-induced ROS and DNA damage. Additionally, HMGA1 promoted the production and secretion of TGFβ1, thereby establishing a positive feedback loop for continuous G6PD expression and resistance to cisplatin (**Figure 7**). Collectively, understanding the mechanism may contribute to a more accurate prognosis and more effective treatment for NSCLC patients with cisplatin resistance.

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Disclosure of conflict of interest

None.

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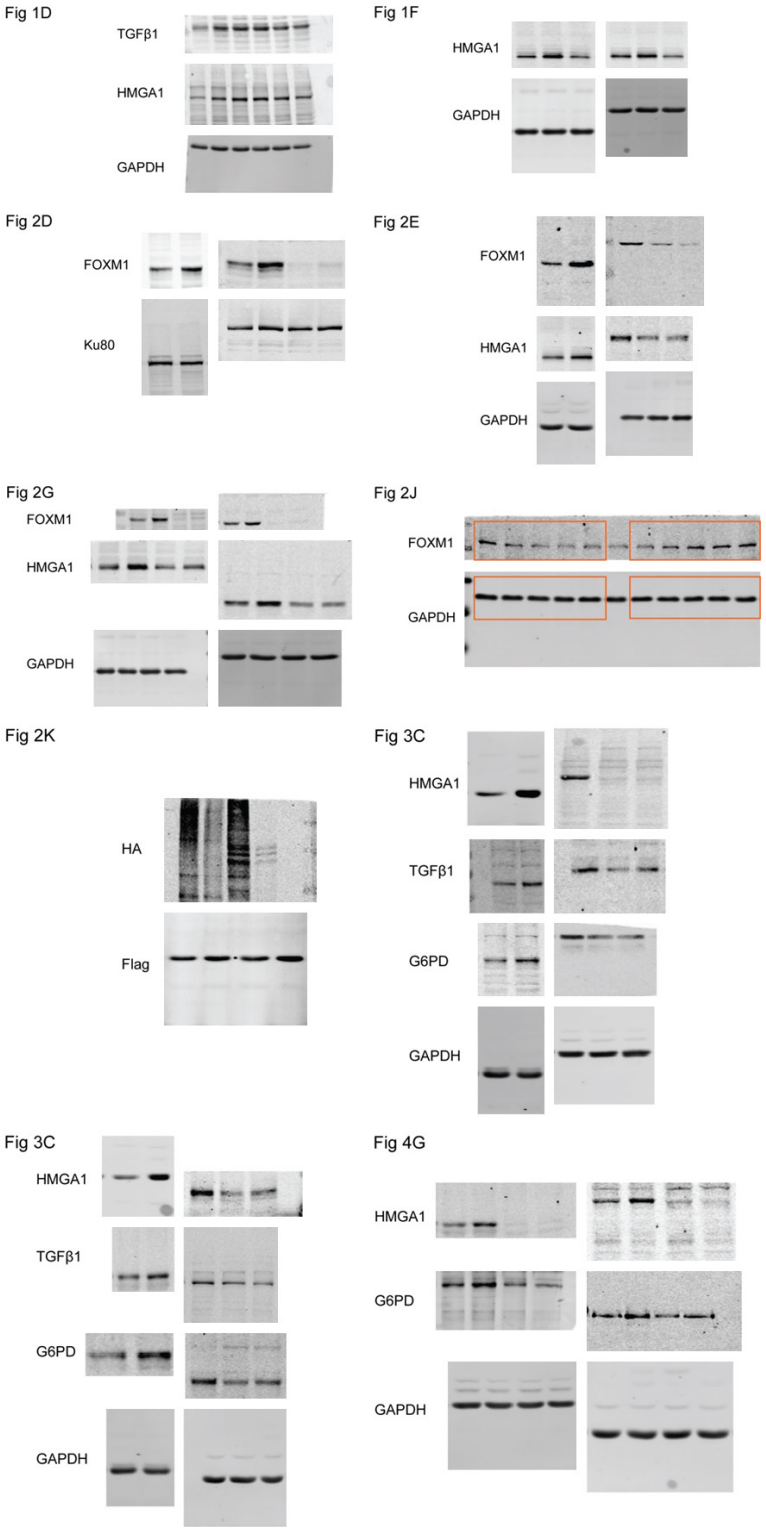

Figure S1. The original images of western blot.

Table S1. Primer sequences for qPCR and ChIP

	Gene name	Forwad primer (5'->3')	Reverse primer (5'->3')
qPCR	HMGA1	GCTCCAAGAAGATCCGCATT	CTCAGTGCCGTCCTTTTCCT
	FOXM1	AATTGCCCGAGCACTTGGAA	TCCACTTTGATGGGTCTCGC
	TGFB1	TGGTGGAAACCCACAACGAA	ACACAGAGATCCGCAGTCCT
	G6PD	GACGACGAAGCGCAGACA	GGTAGTGGTCGATGCGGTAG
	β-actin	CTCCATCCTGGCCTCGCTGT	GCTGTCACCTTCACCGTTCC
ChIP	G6PD promoter	GCCTGGTGACAGAGCGAGATTC	CAATTGAAGGTATCAACTTCTG

Table S2. Differentially expressed genes (DEGs) between H1299^{siCtrl} and H1299^{siHMGA1} cells

Gene	Symbol	Entrez_id	siCtrl#1	siCtrl#2	siHMGA1#1	siHMGA1#2	log2FC	*p* value	FDR	Regulation
NM_001204504	DGKH	160851	2.05841	1.3246	0.00717477	0.00717289	-3.2096	2.34E-55	6.42E-52	Down-regulated
NM_015378	VPS13D	55187	1.47887	0.983994	0.00075053	0.00106282	-2.827	3.24E-42	5.09E-39	Down-regulated
NM_145901	HMGA1	3159	71.6378	56.8912	21.3693	19.1721	-1.4693	2.95E-30	3.59E-27	Down-regulated
NM_001291285	FAT4	79633	1.68697	1.21199	0.228133	0.358392	-1.4474	4.27E-13	1.20E-10	Down-regulated
NM_000402	G6PD	2539	9.2965	8.20298	1.75042	2.47879	-1.4297	3.85E-14	1.28E-11	Down-regulated
NM_001319078	HMGA1	3159	27.322	29.8724	8.06472	10.421	-1.3621	9.00E-20	4.49E-17	Down-regulated
NM_001954	DDR1	780	28.5531	20.0644	5.35907	9.25952	-1.1846	7.19E-10	1.14E-07	Down-regulated
NM_002131	HMGA1	3159	209.129	198.602	86.6153	93.3262	-1.129	1.47E-62	5.37E-59	Down-regulated
NM_000660	TGFB1	7040	24.9804	23.1378	7.02684	10.9766	-1.1099	5.33E-11	1.15E-08	Down-regulated
NM_001300731	AMBRA1	55626	3.30097	3.01052	1.12903	1.23228	-1.071	1.54E-09	2.11E-07	Down-regulated
NM_145899	HMGA1	3159	379.427	349.397	164.129	178.886	-1.037	3.55E-50	7.79E-47	Down-regulated
NM_004723	ARHGEF2	9181	10.3446	9.9513	3.53214	4.89658	-1.0284	1.12E-10	2.20E-08	Down-regulated
NM_002575	SERPINB2	5055	8.47816	9.95415	3.94916	3.11087	-0.9684	2.84E-07	2.23E-05	Down-regulated
NM_001331012	ITSN1	6453	3.87566	4.5212	1.96303	1.54096	-0.9612	4.08E-08	4.03E-06	Down-regulated
NM_019105	TNXB	7148	34.423	35.0005	16.9011	18.3341	-0.9417	3.67E-47	6.71E-44	Down-regulated
NM_182981	OSGIN1	29948	23.6916	18.1728	7.98835	10.2138	-0.935	2.95E-08	3.14E-06	Down-regulated
NM_001004356	FGFRL1	53834	10.5877	10.5015	3.9254	5.48571	-0.918	3.50E-08	3.56E-06	Down-regulated
NM_001122630	CDKN1C	1028	29.674	22.8108	12.5245	11.8843	-0.9138	1.47E-09	2.04E-07	Down-regulated
NM_000930	PLAT	5327	45.727	40.2601	23.1871	19.8007	-0.9049	9.49E-16	3.86E-13	Down-regulated
NM_001297705	ADGRL2	23266	3.02521	3.7029	1.66023	1.35946	-0.8602	1.53E-06	8.80E-05	Down-regulated
NM_001127361	RNF19B	127544	9.41889	8.91271	4.56323	4.62722	-0.838	8.27E-09	9.76E-07	Down-regulated
NM_025182	FAM214B	80256	4.55482	5.08499	2.28259	2.05393	-0.8338	5.27E-06	0.0002507	Down-regulated
NM_201384	PLEC	5339	56.7497	49.8727	29.0487	30.8308	-0.7916	5.81E-26	4.91E-23	Down-regulated
NM_198490	RAB43	339122	12.6457	9.54902	6.01523	5.43713	-0.7902	1.91E-07	1.57E-05	Down-regulated
NM_002555	SLC22A18	5002	40.1338	30.7188	19.2196	17.3751	-0.7878	1.32E-07	1.15E-05	Down-regulated
NM_001300802	RPS6KA4	8986	6.81595	5.6959	3.27211	2.88222	-0.7852	4.80E-06	0.0002366	Down-regulated
NM_001127398	ERLEC1	27248	7.0088	6.77314	3.27236	3.59245	-0.7765	5.83E-06	0.0002701	Down-regulated
NM_004864	GDF15	9518	393.736	329.66	205.87	200.455	-0.769	7.61E-18	3.63E-15	Down-regulated
NM_000213	ITGB4	3691	82.5255	66.1775	40.5772	42.8491	-0.764	2.08E-13	6.01E-11	Down-regulated
NM_006666	RUVBL2	10856	35.3016	38.5682	18.6296	21.9206	-0.7633	6.38E-10	1.05E-07	Down-regulated
NM_201379	PLEC	5339	4.44338	6.50512	2.85558	2.80809	-0.761	3.31E-06	0.0001747	Down-regulated
NM_148415	ATXN2L	11273	25.7002	24.026	14.4961	13.8266	-0.7574	5.84E-17	2.57E-14	Down-regulated
NM_201995	SF1	7536	11.5858	11.0029	5.80243	6.57937	-0.7564	9.41E-09	1.09E-06	Down-regulated
NM_001329226	LRP10	26020	17.8974	12.6391	8.2528	7.86782	-0.7551	1.05E-06	6.61E-05	Down-regulated
NM_001286723	FAM120A	23196	155.519	138.558	84.183	86.0577	-0.7448	1.05E-23	7.18E-21	Down-regulated
NM_206854	QKI	9444	1.18915	1.48802	0.737738	0.620569	-0.7361	3.06E-05	0.0010803	Down-regulated
NM_001005619	ITGB4	3691	34.6279	32.3848	18.9346	20.2316	-0.7335	8.39E-22	5.12E-19	Down-regulated
NM_080744	SSC4D	136853	16.6629	13.4617	7.37556	8.89088	-0.7332	1.40E-06	8.25E-05	Down-regulated
NM_181552	CUX1	1523	4.62977	3.28809	2.17834	2.05951	-0.7332	3.42E-06	0.0001789	Down-regulated
NM_001794	CDH4	1002	26.9031	16.0255	11.2971	10.8334	-0.7264	3.12E-05	0.0010904	Down-regulated
NM_178031	TMEM132A	54972	196.811	158.391	98.4663	107.178	-0.721	2.75E-12	7.01E-10	Down-regulated
NM_001330789	LIMCH1	22998	2.16912	3.77987	1.39298	0.805367	-0.7176	0.000572	0.0102201	Down-regulated

NR_104603	CRB2	286204	31.0932	19.163	13.0675	13.1692	-0.7173	3.24E-05	0.0011266	Down-regulated
NM_004292	RIN1	9610	41.8127	30.9728	20.303	20.561	-0.7082	4.29E-07	3.02E-05	Down-regulated
NM_002146	HOXB3	3213	8.40108	5.04637	2.93375	3.42351	-0.7053	0.000337	0.0067577	Down-regulated
NM_001102595	DTX2	113878	7.50327	5.31738	2.43029	3.42148	-0.7002	0.000494	0.0090079	Down-regulated
NM_001291860	HSPG2	3339	26.8037	27.3024	16.8994	15.7189	-0.6991	2.78E-26	2.55E-23	Down-regulated
NM_212503	CDK18	5129	5.74312	4.38293	2.82086	1.84111	-0.6927	0.000574	0.0102243	Down-regulated
NM_005166	APLP1	333	17.4832	12.879	8.46847	8.19621	-0.6923	1.48E-05	0.0005882	Down-regulated
NM_138565	CTTN	2017	22.5081	15.0297	10.7901	9.45414	-0.6878	5.25E-05	0.0015894	Down-regulated
NM_001145044	SLCO3A1	28232	17.3453	11.6548	7.2352	8.21878	-0.6859	8.63E-05	0.0023218	Down-regulated
NM_003486	SLC7A5	8140	211.665	181.034	112.957	123.467	-0.6846	1.68E-15	6.58E-13	Down-regulated
NM_005904	SMAD7	4092	9.2714	7.78956	4.57883	5.00301	-0.6839	8.14E-06	0.0003507	Down-regulated
NM_001145794	ANTXR2	118429	12.4233	9.70248	6.34663	5.75844	-0.6826	4.00E-05	0.0012995	Down-regulated
NM_001318829	TSC2	7249	7.6304	4.06114	2.5621	2.93639	-0.68	0.000694	0.0118261	Down-regulated
NM_005529	HSPG2	3339	104.789	96.038	58.8314	63.9588	-0.6787	1.05E-24	7.72E-22	Down-regulated
NM_030582	COL18A1	80781	9.86531	7.03539	4.24662	5.08158	-0.6771	4.07E-05	0.0013098	Down-regulated
NM_025250	TTYH3	80727	144.27	115.844	73.3611	82.2111	-0.6744	2.82E-10	4.82E-08	Down-regulated
NM_001031696	PLD3	23646	8.7245	6.30666	4.17825	3.17049	-0.6719	0.000634	0.0110469	Down-regulated
NM_001002030	ECHDC1	55862	18.2775	9.66604	7.02039	6.15841	-0.6705	0.000845	0.0136305	Down-regulated
NR_037941	STX16	8675	6.49327	6.60443	3.85107	3.86364	-0.6704	1.41E-07	1.20E-05	Down-regulated
NM_005438	FOSL1	8061	49.0343	43.9533	28.3721	27.4989	-0.6687	3.86E-11	8.47E-09	Down-regulated
NM_001098416	HDAC7	51564	20.6516	17.0416	11.7731	10.5443	-0.6656	1.03E-07	9.20E-06	Down-regulated
NM_001038	SCNN1A	6337	3.50022	5.05004	2.25189	1.80356	-0.6633	0.000996	0.01534	Down-regulated
NM_001284281	PPP4R3A	55671	6.5869	3.59413	2.57335	1.91169	-0.6612	0.001348	0.0191523	Down-regulated
NM_024111	CHAC1	79094	9.50163	7.12029	4.35919	4.2382	-0.6536	0.000564	0.0100928	Down-regulated
NM_001195267	SSC5D	284297	9.47093	5.62915	3.59539	3.91173	-0.6535	0.000918	0.0144983	Down-regulated
NM_003718	CDK13	8621	4.6576	3.48898	2.47188	2.09612	-0.6487	0.00013	0.0031998	Down-regulated
NM_033113	ZNF628	89887	16.9552	12.6591	8.54466	8.8187	-0.6441	1.15E-05	0.0004783	Down-regulated
NM_003823	TNFRSF6B	8771	222.007	160.86	110.247	115.677	-0.644	2.08E-06	0.0001159	Down-regulated
NM_145903	HMGA1	3159	10.7735	9.85789	5.58294	6.1336	-0.6424	9.79E-05	0.0025732	Down-regulated
NM_001282352	ADAMTS10	81794	7.85068	4.22689	2.49517	2.78916	-0.6372	0.002123	0.0263464	Down-regulated
NM_152441	FBXL14	144699	32.4952	20.0766	12.7581	15.6354	-0.6371	0.000536	0.0096558	Down-regulated
NM_004210	NEURL1	9148	24.9788	19.4122	13.6737	13.1008	-0.6364	8.78E-07	5.73E-05	Down-regulated
NM_001330518	PCYT2	5833	7.37844	5.5088	3.77507	3.6789	-0.6345	7.16E-05	0.0019917	Down-regulated
NM_001077261	NCOR2	9612	56.7268	44.8887	31.9437	30.7676	-0.6338	2.83E-09	3.57E-07	Down-regulated
NM_003749	IRS2	8660	24.4889	20.4339	13.5685	14.2358	-0.6325	1.27E-09	1.81E-07	Down-regulated
NM_000576	IL1B	3553	40.6259	40.1246	25.2534	24.5165	-0.6317	8.54E-10	1.32E-07	Down-regulated
NM_020912	FLYWCH1	84256	32.5115	20.0851	14.925	14.3727	-0.6293	0.00037	0.0072619	Down-regulated
NM_006478	GAS2L1	10634	27.3189	18.5451	10.999	14.561	-0.6284	0.000396	0.0075746	Down-regulated
NM_001001329	PRKCSH	5589	9.04326	7.39725	4.84671	4.56124	-0.6264	0.000187	0.0043107	Down-regulated
NM_145902	HMGA1	3159	22.3535	23.8325	11.4153	15.6453	-0.6245	6.98E-05	0.0019504	Down-regulated
NM_000389	CDKN1A	1026	540.76	480.14	325.753	320.638	-0.6237	2.27E-21	1.25E-18	Down-regulated
NM_001030010	ALDH3B1	221	6.22856	5.80559	3.4198	3.49922	-0.6203	0.000206	0.0046167	Down-regulated
NM_015444	TMEM158	25907	13.0179	13.1408	7.19346	8.31223	-0.6185	5.39E-05	0.0016165	Down-regulated
NM_032385	FAXDC2	10826	5.16686	5.02771	2.89881	2.98678	-0.6134	0.000288	0.0059803	Down-regulated
NM_003483	HMGA2	8091	8.09234	8.2851	5.24751	4.84563	-0.6109	1.41E-06	8.25E-05	Down-regulated
NM_198076	COX20	116228	11.6156	10.2766	7.33644	4.97669	-0.6108	0.000671	0.0115281	Down-regulated
NM_138440	VASN	114990	277.078	219.821	145.548	165.057	-0.6095	3.47E-08	3.56E-06	Down-regulated
NM_153813	ZFPM1	161882	15.5156	14.282	8.65433	9.83989	-0.6093	5.04E-07	3.50E-05	Down-regulated
NM_198830	ACLY	47	11.91	10.9781	7.94645	4.54959	-0.6089	0.001272	0.0183019	Down-regulated
NM_001323951	MBD1	4152	8.62307	4.8266	3.02043	3.58478	-0.6083	0.002814	0.0320824	Down-regulated
NM_001113492	9-Sep	10801	9.62016	10.4597	6.85049	5.06992	-0.6078	0.000127	0.0031617	Down-regulated
NM_001199741	GADD45A	1647	22.316	17.5746	12.0155	11.1774	-0.6064	0.000272	0.005734	Down-regulated
NM_006454	MXD4	10608	48.2621	36.3998	25.6993	26.5947	-0.6054	2.65E-06	0.0001436	Down-regulated
NM_001330358	MTHFR	4524	3.17352	2.61068	1.88272	1.35358	-0.6049	0.000977	0.015172	Down-regulated
NM_001042682	RERE	473	23.0039	21.3534	13.3249	15.031	-0.5975	1.83E-10	3.29E-08	Down-regulated
NM_001100878	MROH6	642475	23.4096	16.9988	9.45567	13.7345	-0.5973	0.000764	0.0126457	Down-regulated
NM_024536	CHPF	79586	152.883	110.995	78.1321	85.6928	-0.595	5.75E-06	0.0002674	Down-regulated

NM_006848	CCDC85B	11007	244.314	180.165	124.851	137.034	-0.5936	7.00E-06	0.0003095	Down-regulated
NM_175573	ADRM1	11047	16.8798	10.7907	6.20823	8.10559	-0.5935	0.002965	0.0330204	Down-regulated
NM_005734	HIPK3	10114	3.85133	3.54545	2.36055	0.968555	-0.5931	0.004371	0.0439583	Down-regulated
NM_182965	SPHK1	8877	8.10886	5.72038	3.90891	3.49748	-0.5925	0.002339	0.0282539	Down-regulated
NM_130444	COL18A1	80781	2.38956	2.28818	1.39406	1.38534	-0.5896	0.000372	0.0072721	Down-regulated
NM_024927	PLEKHH3	79990	20.2776	14.0579	10.0338	10.5003	-0.5889	0.000281	0.005886	Down-regulated
NM_001009813	MEIS3	56917	17.8658	12.4383	8.93069	8.71094	-0.5888	0.000725	0.0121473	Down-regulated
NM_001127266	TMEM129	92305	24.1551	17.5151	13.2738	11.949	-0.5887	0.000145	0.0035016	Down-regulated
NM_001185077	ARHGDIA	396	23.9173	14.9886	11.4557	10.7108	-0.5884	0.001202	0.0176163	Down-regulated
NM_014963	SBNO2	22904	85.2209	58.8891	41.4846	47.2842	-0.5874	4.78E-05	0.0014832	Down-regulated
NM_001029882	AHDC1	27245	25.7665	20.7441	14.3458	15.1985	-0.5866	3.12E-07	2.40E-05	Down-regulated
NM_130802	MEN1	4221	14.3777	9.39831	7.04326	6.74821	-0.5858	0.000946	0.0148382	Down-regulated
NM_001005360	DNM2	1785	26.2152	16.1508	9.97915	13.8746	-0.5842	0.001767	0.0232903	Down-regulated
NM_024336	IRX3	79191	39.2964	27.8107	19.0235	21.6337	-0.5842	0.000186	0.0042923	Down-regulated
NM_005560	LAMA5	3911	206.875	177.643	119.501	130.417	-0.5835	1.12E-12	3.08E-10	Down-regulated
NM_025069	ZNF703	80139	62.1668	51.6232	33.9637	38.5942	-0.5827	1.98E-07	1.59E-05	Down-regulated
NM_004104	FASN	2194	100.395	85.0099	55.5483	64.0167	-0.5824	2.78E-09	3.56E-07	Down-regulated
NM_014726	TBKBP1	9755	9.44035	7.91864	5.08353	5.71201	-0.5809	3.71E-05	0.0012242	Down-regulated
NM_013241	FHOD1	29109	15.6628	12.8316	8.89332	9.07916	-0.58	5.08E-06	0.0002435	Down-regulated
NM_020210	SEMA4B	10509	22.5911	18.3486	13.6639	12.1347	-0.5799	6.77E-06	0.0003033	Down-regulated
NM_015516	TSKU	25987	26.0066	19.9475	14.5355	14.0742	-0.5794	3.28E-05	0.0011345	Down-regulated
NM_001322934	NFKB2	4791	19.3119	17.4158	7.49783	13.198	-0.579	0.002093	0.0261233	Down-regulated
NM_018022	TMEM51	55092	7.37877	9.62731	4.47418	5.06766	-0.5783	0.002257	0.0277192	Down-regulated
NM_001033053	NLRP1	22861	3.5133	2.17873	1.55667	1.39626	-0.5761	0.004337	0.0437748	Down-regulated
NR_073080	PHLDA3	23612	165.373	111.585	83.0162	87.4106	-0.5734	0.000128	0.0031799	Down-regulated
NM_020764	CASKIN1	57524	2.90878	2.09558	1.29169	1.49109	-0.5724	0.003037	0.033657	Down-regulated
NM_006540	NCOA2	10499	1.88335	2.7152	1.24555	0.411816	-0.572	0.005079	0.0487558	Down-regulated
NM_017983	WIPI1	55062	7.50741	8.81966	4.87232	4.6844	-0.5714	0.001413	0.0197352	Down-regulated
NM_002228	JUN	3725	218.357	180.166	125.436	133.734	-0.5714	1.14E-09	1.67E-07	Down-regulated
NM_001135999	RUSC2	9853	7.43227	6.14377	3.83693	4.60933	-0.5702	0.000118	0.0029867	Down-regulated
NM_032823	C9orf3	84909	7.449	8.96319	4.85799	5.16715	-0.5702	0.000375	0.0073085	Down-regulated
NM_004421	DVL1	1855	38.1017	27.7036	20.1057	20.9795	-0.5697	7.46E-05	0.0020635	Down-regulated
NM_001282979	TLE3	7090	9.47806	6.0807	5.00508	4.04134	-0.5684	0.001816	0.0237779	Down-regulated
NR_049765	ZBTB7B	51043	10.7805	8.89342	6.77541	5.22866	-0.5683	0.000428	0.0080256	Down-regulated
NM_022566	MESDC1	59274	90.3948	60.3829	44.2793	48.8629	-0.5682	0.000198	0.0045056	Down-regulated
NM_016154	RAB4B	53916	17.2444	14.0988	10.0347	7.72898	-0.5675	0.002432	0.0291132	Down-regulated
NM_001347	DGKQ	1609	11.7516	9.30881	6.46377	6.83114	-0.5671	3.94E-05	0.001287	Down-regulated
NM_024426	WT1	7490	29.873	21.3323	15.3888	16.3789	-0.5671	0.000173	0.0040377	Down-regulated
NM_001098534	BAG6	7917	31.6224	24.3697	16.1052	19.1661	-0.5643	6.31E-05	0.0018084	Down-regulated
NM_001039574	KCNC4	3749	9.74189	7.60469	5.37666	5.41014	-0.5641	0.0002	0.0045233	Down-regulated
NM_001304815	CIC	23152	22.4879	16.2039	10.9815	13.2566	-0.5607	0.000165	0.0038805	Down-regulated
NM_005944	CD200	4345	30.6277	25.9444	16.883	19.3404	-0.5605	9.11E-06	0.0003895	Down-regulated
NM_015925	LSR	51599	30.2656	25.6752	17.0021	18.9005	-0.5601	5.67E-06	0.0002659	Down-regulated
NM_173214	NFAT5	10725	3.76026	4.9796	2.93422	2.51566	-0.5575	0.000343	0.0068149	Down-regulated
NM_198576	AGRN	375790	734.063	566.062	403.531	444.08	-0.5571	3.93E-07	2.84E-05	Down-regulated
NM_152264	SLC39A13	91252	28.3637	23.6129	17.0686	16.4678	-0.5562	4.50E-06	0.0002246	Down-regulated
NM_001080495	TNRC18	84629	123.779	100.842	69.9354	77.6979	-0.5559	2.15E-08	2.33E-06	Down-regulated
NM_139162	MIEF2	125170	12.8465	9.06406	6.43965	6.74531	-0.5543	0.001359	0.0192513	Down-regulated
NM_015037	ZSWIM8	23053	11.5579	8.08844	4.85969	6.85759	-0.5536	0.001912	0.0244679	Down-regulated
NM_198925	SEMA4B	10509	7.2245	8.12608	4.56709	5.14935	-0.5529	0.000146	0.0035063	Down-regulated
NM_002318	LOXL2	4017	523.007	479.073	335.817	336.844	-0.5499	6.94E-25	5.45E-22	Down-regulated
NM_004472	FOXD1	2297	63.2557	49.3927	32.4959	39.4861	-0.5466	8.33E-05	0.0022695	Down-regulated
NM_004409	DMPK	1760	19.1229	10.6467	7.86467	8.98088	-0.5465	0.004812	0.0468482	Down-regulated
NM_178570	RTN4RL2	349667	13.9491	12.063	7.46658	8.87922	-0.5464	0.000349	0.0069033	Down-regulated
NM_005475	SH2B3	10019	7.93468	7.84975	5.16236	5.24905	-0.5424	7.19E-07	4.79E-05	Down-regulated
NM_198042	PDLIM2	64236	81.1085	58.6425	42.5397	46.0948	-0.5416	0.000214	0.0047621	Down-regulated
NM_001321096	SREBF1	6720	94.5525	65.5626	49.4665	53.2408	-0.5408	0.000129	0.003184	Down-regulated

NM_003311	PHLDA2	7262	118.418	93.6351	63.6038	72.0516	-0.5404	5.18E-05	0.0015836	Down-regulated
NM_201525	ADGRG1	9289	12.1038	9.3863	6.55873	7.16659	-0.5395	0.000224	0.0049127	Down-regulated
NM_001330740	RUSC2	9853	8.8052	6.98064	4.67627	5.23678	-0.5395	0.000704	0.0119223	Down-regulated
NM_014238	KSR1	8844	4.25254	3.86449	2.30356	2.71947	-0.5394	0.001134	0.0168242	Down-regulated
NM_001290051	UHRF1	29128	7.42842	5.05102	3.07811	4.15341	-0.539	0.004797	0.0468098	Down-regulated
NM_005360	MAF	4094	10.8522	6.78138	5.24139	4.93237	-0.5385	0.004993	0.0482608	Down-regulated
NM_001394	DUSP4	1846	3.36835	2.99341	1.6981	2.17983	-0.5376	0.002229	0.0274347	Down-regulated
NM_001321123	ITGB4	3691	371.372	296.703	217.625	227.535	-0.5374	3.37E-08	3.53E-06	Down-regulated
NM_001220778	CDKN1A	1026	29.7246	28.3204	21.2624	15.9426	-0.5362	0.000212	0.004739	Down-regulated
NM_020360	PLSCR3	57048	49.1584	41.2587	28.1965	31.1878	-0.5361	4.30E-06	0.0002174	Down-regulated
NM_017607	PPP1R12C	54776	95.8882	66.1098	46.7849	56.0922	-0.5358	0.000424	0.0079793	Down-regulated
NM_000022	ADA	100	25.6893	24.1882	16.9308	15.626	-0.5348	1.74E-05	0.0006633	Down-regulated
NM_001162371	LOC728392	728392	45.1073	41.6426	28.0138	29.4056	-0.5348	2.68E-07	2.12E-05	Down-regulated
NM_001304762	EVA1B	55194	117.3	80.3701	60.3281	63.449	-0.5319	0.000696	0.0118563	Down-regulated
NM_001163809	WDR81	124997	8.33966	6.65677	5.2259	4.45533	-0.5307	0.000228	0.0049948	Down-regulated
NM_002616	PER1	5187	3.66876	2.82175	1.86157	2.03218	-0.5306	0.003819	0.039716	Down-regulated
NM_002581	PAPPA	5069	20.8127	21.1308	14.7261	13.7437	-0.5299	7.86E-14	2.46E-11	Down-regulated
NM_001242488	ZSWIM8	23053	6.01779	4.69348	3.70312	3.05549	-0.5288	0.001122	0.0166712	Down-regulated
NM_019032	ADAMTSL4	54507	22.0602	20.9056	13.9315	14.9943	-0.528	5.40E-09	6.67E-07	Down-regulated
NM_001114123	ELK1	2002	9.87751	8.95116	5.89773	6.33007	-0.5272	0.000145	0.0035021	Down-regulated
NR_037688	ACTG1	71	326.299	256.634	199.276	188.228	-0.527	9.40E-07	5.97E-05	Down-regulated
NM_174905	FAM98C	147965	31.4285	20.7055	15.5925	15.9408	-0.5259	0.003516	0.0375359	Down-regulated
NM_203384	RNH1	6050	19.1029	15.1306	12.1037	9.04471	-0.5224	0.002675	0.0310646	Down-regulated
NM_005354	JUND	3727	187.303	130.367	91.9604	112.284	-0.5214	0.000511	0.0092844	Down-regulated
NM_020719	PRR12	57479	10.7422	8.81578	5.99035	6.91353	-0.5208	6.94E-05	0.0019486	Down-regulated
NM_152611	LRRN4	164312	98.1522	93.1158	64.4182	66.4427	-0.519	2.46E-17	1.12E-14	Down-regulated
NM_006133	DAGLA	747	12.3853	9.86063	6.93566	7.71191	-0.5183	0.000109	0.0028116	Down-regulated
NM_015178	RHOBTB2	23221	5.47685	5.38097	3.08481	3.93625	-0.5176	0.000651	0.0112818	Down-regulated
NM_018012	KIF26B	55083	5.61223	4.47335	3.18437	3.40227	-0.517	0.000314	0.0063907	Down-regulated
NM_015073	SIPA1L3	23094	26.3461	21.9582	15.6164	16.9616	-0.5169	6.96E-07	4.66E-05	Down-regulated
NM_001694	ATP6V0C	527	107.614	106.685	55.5332	81.3081	-0.5165	0.000927	0.0146295	Down-regulated
NM_001166347	SLC26A11	284129	13.0829	9.12946	6.78351	7.13533	-0.5163	0.002443	0.0291943	Down-regulated
NM_003047	SLC9A1	6548	21.0534	21.032	12.8979	15.4019	-0.5161	2.88E-06	0.0001551	Down-regulated
NM_001455	FOXO3	2309	5.50789	4.85036	3.58818	3.29832	-0.5158	4.87E-05	0.0015033	Down-regulated
NM_032792	ZBTB45	84878	6.70846	5.77144	4.08211	3.60395	-0.5152	0.004046	0.0414072	Down-regulated
NM_152992	POMZP3	22932	38.112	28.1172	17.8049	23.3373	-0.5147	0.002871	0.0324992	Down-regulated
NM_006079	CITED2	10370	76.6288	66.6417	48.8571	48.0804	-0.5142	4.34E-08	4.26E-06	Down-regulated
NM_022842	CDCP1	64866	8.62744	10.481	6.42981	6.25865	-0.5131	9.25E-05	0.0024583	Down-regulated
NM_001080855	PXN	5829	48.0937	39.0396	28.2836	30.3586	-0.5115	4.80E-06	0.0002366	Down-regulated
NM_001924	GADD45A	1647	353.622	324.701	235.386	228.999	-0.5109	2.07E-16	8.75E-14	Down-regulated
NM_003635	NDST2	8509	7.36179	6.24839	3.97233	4.82354	-0.5102	0.001157	0.0170824	Down-regulated
NM_003043	SLC6A6	6533	13.2084	13.9973	8.8647	9.65668	-0.5101	1.47E-07	1.24E-05	Down-regulated
NM_173564	NYAP1	222950	4.54362	3.77806	2.37032	2.75472	-0.5093	0.004812	0.0468482	Down-regulated
NM_016270	KLF2	10365	47.1887	41.9251	26.4432	33.0311	-0.5093	4.40E-05	0.0013852	Down-regulated
NM_014994	MAPKBP1	23005	2.95123	3.05636	1.82643	2.09789	-0.5074	0.000762	0.0126457	Down-regulated
NM_001144950	SSC5D	284297	9.67318	9.04988	5.89834	6.69043	-0.5074	1.91E-05	0.0007198	Down-regulated
NM_152600	ZNF579	163033	130.464	89.9007	65.352	77.8148	-0.5067	0.000834	0.0134714	Down-regulated
NM_004943	DMWD	1762	32.6817	21.5748	16.5475	18.228	-0.5043	0.002102	0.0261759	Down-regulated
NM_001013642	TRNP1	388610	201.657	158.517	115.334	127.324	-0.5037	1.07E-05	0.0004454	Down-regulated
NM_005027	PIK3R2	5296	66.5036	50.5968	37.4011	41.1124	-0.5035	5.92E-05	0.0017293	Down-regulated
NM_001014832	PAK4	10298	41.9751	32.3168	22.6249	26.5449	-0.5032	0.000308	0.0062767	Down-regulated
NM_032429	LZTS2	84445	13.6488	12.0891	8.68333	8.57586	-0.503	5.57E-05	0.0016561	Down-regulated
NM_001271875	CUEDC1	404093	35.7858	25.9967	19.8346	21.0034	-0.502	0.00041	0.0077816	Down-regulated
NM_017883	WDR13	64743	13.9528	11.5943	8.14724	8.55905	-0.5017	0.000796	0.0130217	Down-regulated
NM_024963	FBXL18	80028	12.921	12.4319	8.76155	8.74312	-0.5016	1.82E-10	3.29E-08	Down-regulated
NM_014002	IKBKE	9641	12.1704	9.92335	6.56387	7.92977	-0.5012	0.000887	0.0141833	Down-regulated
NR_037718	EFEMP2	30008	24.5126	25.9902	15.6479	18.193	-0.5006	7.75E-05	0.0021333	Down-regulated

NM_207115	ZNF580	51157	31.3328	26.8672	15.9132	21.0802	-0.5002	0.002763	0.0316662	Down-regulated
NM_014738	TMEM94	9772	9.27107	7.85893	5.77987	5.77503	-0.4995	4.22E-05	0.0013408	Down-regulated
NM_021151	CROT	54677	4.27451	4.01478	2.45787	2.74689	-0.4988	0.005029	0.0485307	Down-regulated
NM_032772	ZNF503	84858	55.2493	40.9763	30.0135	34.0378	-0.4987	0.00029	0.0060045	Down-regulated
NM_022164	TINAGL1	64129	292.24	237.316	174.103	187.572	-0.4983	5.66E-07	3.89E-05	Down-regulated
NM_001271938	MEGF8	1954	17.5773	14.6826	11.1596	10.9651	-0.4977	6.38E-07	4.30E-05	Down-regulated
NM_017514	PLXNA3	55558	8.18603	6.40145	4.72266	4.99426	-0.4975	0.00036	0.0070831	Down-regulated
NM_005737	ARL4C	10123	10.8983	9.91992	6.96064	7.17246	-0.4971	1.78E-05	0.0006746	Down-regulated
NM_001135635	C11orf68	83638	26.5543	18.8569	14.1331	14.9094	-0.4964	0.002999	0.0333328	Down-regulated
NM_018207	TRIM62	55223	4.29659	3.70373	2.46758	2.63856	-0.4935	0.004041	0.0413981	Down-regulated
NM_001308046	TNK2	10188	7.38961	5.5317	4.28919	4.09329	-0.4921	0.002576	0.0303289	Down-regulated
NR_028406	FXYD5	53827	22.2302	20.0052	14.1731	14.1931	-0.491	0.000174	0.0040515	Down-regulated
NM_001162383	ARHGEF2	9181	42.255	39.8299	28.0482	29.151	-0.4905	8.60E-12	2.01E-09	Down-regulated
NM_024747	HPS6	79803	21.5378	16.5395	12.1377	13.2243	-0.4874	0.000767	0.0126686	Down-regulated
NR_136702	SFPQ	6421	31.4606	31.2873	16.9653	24.3418	-0.4864	0.001905	0.0244077	Down-regulated
NM_007286	SYNPO	11346	29.2952	24.2755	18.0811	18.8218	-0.4861	4.46E-06	0.0002236	Down-regulated
NM_203434	IER5L	389792	95.2489	94.1432	55.8749	73.2124	-0.4846	7.84E-05	0.0021511	Down-regulated
NM_014331	SLC7A11	23657	16.4586	19.1569	12.812	11.7912	-0.4844	5.24E-06	0.00025	Down-regulated
NM_001282290	ARHGAP27	201176	5.27332	5.11824	3.54614	3.43619	-0.4843	0.000718	0.0120499	Down-regulated
NM_032421	CLIP2	7461	9.53346	8.16435	6.04239	6.06608	-0.4842	5.25E-05	0.0015894	Down-regulated
NM_175875	SIX5	147912	31.9162	22.0891	16.3744	19.1043	-0.4838	0.002354	0.0284102	Down-regulated
NM_001081492	KRT80	144501	18.4733	17.9798	12.1973	13.0959	-0.4836	3.82E-07	2.80E-05	Down-regulated
NM_014417	BBC3	27113	42.5232	31.6693	20.6558	27.5453	-0.4826	0.003517	0.0375359	Down-regulated
NM_018986	SH3TC1	54436	31.5304	22.5856	17.8772	18.4226	-0.4825	0.000766	0.0126686	Down-regulated
NM_001039999	FAM83G	644815	14.4449	10.0491	8.03542	7.86395	-0.4816	0.004108	0.0419264	Down-regulated
NM_006927	ST3GAL2	6483	10.649	8.10665	6.42385	6.09452	-0.4816	0.001214	0.0177464	Down-regulated
NM_000287	PEX6	5190	14.2351	11.1322	9.01891	7.9304	-0.4805	0.001137	0.0168282	Down-regulated
NM_020452	ATP8B2	57198	4.79818	5.76703	3.6728	3.42923	-0.4791	0.00115	0.0169915	Down-regulated
NM_001271223	OBSCN	84033	1.56565	1.49422	1.05329	1.06738	-0.4781	1.16E-05	0.0004815	Down-regulated
NM_005165	ALDOC	230	12.4626	11.5028	8.04958	7.7824	-0.4779	0.002423	0.029077	Down-regulated
NM_001018078	FPGS	2356	18.6778	19.248	13.5505	12.5353	-0.4778	3.98E-05	0.0012958	Down-regulated
NM_032862	TIGD5	84948	19.8603	14.8918	10.4129	12.4747	-0.4777	0.002949	0.0329441	Down-regulated
NM_004073	PLK3	1263	23.099	18.8295	14.5301	14.0723	-0.4765	0.000232	0.005033	Down-regulated
NM_002149	HPCAL1	3241	131.558	97.2799	72.5789	82.2132	-0.4764	0.000458	0.0084616	Down-regulated
NM_001135770	PVR	5817	18.7527	13.8829	11.0329	10.148	-0.4756	0.005107	0.0488931	Down-regulated
NM_002205	ITGA5	3678	49.391	48.5663	34.5889	34.6603	-0.4745	1.14E-14	4.18E-12	Down-regulated
NM_001141973	ATP13A2	23400	14.7339	13.1999	8.59755	10.5107	-0.4723	0.000322	0.0065175	Down-regulated
NM_001142864	PIEZO1	9780	105.364	84.2712	64.5079	67.9618	-0.4719	2.65E-06	0.0001436	Down-regulated
NM_003461	ZYX	7791	120.132	109.872	76.7027	84.8429	-0.4713	1.12E-08	1.28E-06	Down-regulated
NM_005632	CAPN15	6650	35.6403	24.396	18.4367	21.643	-0.4708	0.002584	0.0303289	Down-regulated
NM_001005731	ITGB4	3691	197.785	214.262	139.607	152.203	-0.469	1.20E-10	2.32E-08	Down-regulated
NM_001280794	EPHB6	2051	8.83128	7.01507	5.1066	5.57612	-0.4683	0.001846	0.0238439	Down-regulated
NM_001271014	KTN1	3895	9.27246	8.39797	5.60796	6.55437	-0.4678	0.000283	0.0059152	Down-regulated
NM_014272	ADAMTS7	11173	20.4255	15.5554	11.6521	12.9788	-0.4667	0.000611	0.0107098	Down-regulated
NM_173542	PLBD2	196463	26.4879	26.4291	18.2219	19.0013	-0.4664	3.20E-07	2.44E-05	Down-regulated
NM_001173431	OBSL1	23363	12.8052	9.01484	7.01815	7.6194	-0.4658	0.002867	0.0324854	Down-regulated
NR_045600	SLC52A2	79581	53.3106	35.7469	28.532	30.6761	-0.4658	0.00363	0.0383604	Down-regulated
NM_024954	UBTD1	80019	106.671	75.0845	59.2039	63.5876	-0.4656	0.001389	0.0194808	Down-regulated
NM_001173408	OBSL1	23363	80.7712	63.3578	48.6333	51.629	-0.4651	4.75E-05	0.001483	Down-regulated
NM_138370	PKDCC	91461	32.4947	23.6077	18.6934	19.2268	-0.465	0.001663	0.0223212	Down-regulated
NM_001099696	REPIN1	29803	22.1202	20.9235	14.3467	15.7845	-0.4647	7.82E-06	0.0003395	Down-regulated
NM_080725	SRXN1	140809	26.7407	23.8644	17.539	17.8876	-0.4641	6.49E-06	0.0002945	Down-regulated
NM_002359	MAFG	4097	15.9351	13.3074	10.8513	9.34181	-0.4636	0.000293	0.0060432	Down-regulated
NM_021727	FADS3	3995	248.834	195.263	152.192	157.065	-0.4634	2.04E-05	0.0007665	Down-regulated
NM_006516	SLC2A1	6513	33.4611	30.6557	23.4987	21.7519	-0.463	3.30E-07	2.48E-05	Down-regulated
NM_001113182	BRD2	6046	21.5406	20.6477	13.7705	15.896	-0.4619	5.55E-06	0.0002616	Down-regulated
NM_173854	SLC41A1	254428	8.11196	7.84261	5.60551	5.5666	-0.4614	3.36E-05	0.00115	Down-regulated

NM_015103	PLXND1	23129	26.5839	23.4368	17.3708	18.1105	-0.4595	1.03E-07	9.20E-06	Down-regulated
NM_007350	PHLDA1	22822	19.7162	21.5534	15.5282	13.4846	-0.4592	2.11E-05	0.00079	Down-regulated
NM_178507	OAF	220323	18.3543	13.9379	10.1717	11.3303	-0.4589	0.004795	0.0468098	Down-regulated
NM_001136053	TPRA1	131601	66.622	55.0685	42.9034	42.1708	-0.4586	2.82E-05	0.0010105	Down-regulated
NM_033452	TRIM47	91107	38.8035	34.2998	25.0436	26.331	-0.4585	6.85E-06	0.0003058	Down-regulated
NM_005884	PAK4	10298	80.5945	59.414	45.2305	51.1358	-0.4573	0.000782	0.0128632	Down-regulated
NM_017617	NOTCH1	4851	7.1226	6.04326	4.39484	4.81281	-0.4566	0.000131	0.0032206	Down-regulated
NM_001037330	TRIM16L	147166	53.4891	57.6574	40.3168	38.1959	-0.4563	1.31E-06	7.87E-05	Down-regulated
NM_172353	CD46	4179	14.9901	11.4543	7.80311	9.89125	-0.4562	0.005056	0.048606	Down-regulated
NM_032339	MIEN1	84299	35.586	32.6815	24.5005	23.1452	-0.4557	6.61E-05	0.0018834	Down-regulated
NM_001243795	CHST12	55501	10.0804	9.00496	5.96885	6.84501	-0.4555	0.004715	0.0462248	Down-regulated
NM_021228	SCAF1	58506	78.5895	62.4869	46.2742	52.545	-0.4554	8.45E-05	0.002292	Down-regulated
NM_001130012	SLC9A3R2	9351	11.9904	11.0542	7.30723	8.39627	-0.4551	0.002128	0.0263725	Down-regulated
NM_181336	LEMD2	221496	49.5142	36.9785	28.2615	31.3516	-0.4546	0.000913	0.0144535	Down-regulated
NM_003040	SLC4A2	6522	141.021	108.134	87.4548	87.5751	-0.454	5.35E-05	0.0016097	Down-regulated
NM_003646	DGKZ	8525	28.6001	22.8705	17.1673	18.7031	-0.454	0.000271	0.0057318	Down-regulated
NM_017789	SEMA4C	54910	21.2567	16.9461	13.1441	13.4574	-0.453	0.00038	0.0073744	Down-regulated
NM_002229	JUNB	3726	58.1028	44.905	34.0093	37.1362	-0.453	0.000676	0.01156	Down-regulated
NM_001901	CTGF	1490	43.2752	44.2597	29.4375	32.6104	-0.4527	1.67E-06	9.52E-05	Down-regulated
NM_022833	FAM129B	64855	184.743	150.815	118.928	119.437	-0.4516	1.41E-06	8.25E-05	Down-regulated
NM_003780	B4GALT2	8704	104.508	74.6591	58.0615	65.1472	-0.45	0.001537	0.0210189	Down-regulated
NM_181892	UBE2D3	7323	16.8676	13.4777	9.55214	11.4029	-0.4499	0.001443	0.0200095	Down-regulated
NM_006312	NCOR2	9612	43.9371	35.4279	27.3669	28.9127	-0.4498	1.43E-05	0.0005679	Down-regulated
NM_001330645	ADGRL2	23266	4.32146	5.07735	3.47157	2.93626	-0.4493	0.003615	0.0382714	Down-regulated
NM_001199417	ARHGAP23	57636	176.819	148.703	111.561	120.94	-0.4484	4.15E-07	2.98E-05	Down-regulated
NM_001127621	GALE	2582	36.3614	36.4323	24.4369	26.8608	-0.4482	3.49E-05	0.0011718	Down-regulated
NM_001297654	DDR1	780	61.61	49.2381	37.904	40.0853	-0.4479	0.000109	0.0028095	Down-regulated
NM_203403	LURAP1L	286343	10.0461	8.95848	5.98241	7.02179	-0.4472	0.003059	0.0337563	Down-regulated
NM_023083	CAPN10	11132	16.9353	13.3647	10.4902	10.4033	-0.4466	0.001708	0.0226811	Down-regulated
NM_145057	CDC42EP5	148170	152.299	116.808	89.1654	96.1655	-0.4466	0.000709	0.0119724	Down-regulated
NM_182557	BCL9L	283149	87.9123	76.9363	57.4363	61.0308	-0.4463	6.68E-09	7.97E-07	Down-regulated
NM_002204	ITGA3	3675	577.602	512.258	389.67	396.2	-0.4457	3.19E-12	7.97E-10	Down-regulated
NM_182919	TICAM1	148022	17.7645	14.8052	11.5429	11.2179	-0.4456	0.000553	0.0099437	Down-regulated
NM_014601	EHD2	30846	136.595	114.77	83.7718	95.0975	-0.4451	8.87E-06	0.0003803	Down-regulated
NM_001145524	YPEL3	83719	29.0817	29.0702	19.1912	20.4919	-0.4448	0.002463	0.0293324	Down-regulated
NM_005524	HES1	3280	46.5602	43.8067	29.6823	33.9335	-0.4443	8.32E-05	0.0022695	Down-regulated
NM_032357	CCDC115	84317	14.7153	13.1666	10.4404	8.63754	-0.4436	0.003618	0.0382714	Down-regulated
NM_001145638	GPSM1	26086	22.869	17.3235	12.9813	14.8434	-0.4424	0.002098	0.0261501	Down-regulated
NM_016174	CERCAM	51148	14.4433	12.4296	8.69328	9.98889	-0.442	0.001431	0.0199192	Down-regulated
NM_001286365	MAP7D1	55700	79.7943	62.703	46.5706	53.8489	-0.4411	0.000328	0.0066387	Down-regulated
NM_032789	PARP10	84875	27.4342	20.9659	15.3505	18.2015	-0.441	0.00216	0.0267059	Down-regulated
NM_001306215	ZNF827	152485	3.81291	4.0409	2.87026	2.65771	-0.4407	0.000667	0.0114902	Down-regulated
NM_033025	SYDE1	85360	32.9569	27.1606	21.319	21.3342	-0.4403	8.76E-05	0.0023512	Down-regulated
NM_016423	ZNF219	51222	53.0753	45.3824	31.502	38.1069	-0.4394	0.000254	0.0054437	Down-regulated
NM_020376	PNPLA2	57104	102.402	85.1807	61.4864	71.5456	-0.4389	0.000105	0.0027231	Down-regulated
NM_001556	IKBKB	3551	9.40254	8.69184	6.83647	5.87325	-0.4383	0.000861	0.0138389	Down-regulated
NM_001281	TBCB	1155	43.1345	39.1755	28.5423	29.8703	-0.4383	4.11E-05	0.0013178	Down-regulated
NM_030935	TSC22D4	81628	60.3409	46.9321	38.085	37.4993	-0.4382	0.000391	0.0074975	Down-regulated
NM_001135050	IGSF9	57549	12.9013	13.1707	8.15925	10.1603	-0.4382	0.000912	0.0144535	Down-regulated
NM_152914	NATD1	256302	12.9853	10.3367	7.95744	8.42057	-0.438	0.000957	0.0149534	Down-regulated
NM_021070	LTBP3	4054	44.2417	42.61	31.8532	31.1272	-0.438	1.13E-11	2.58E-09	Down-regulated
NM_001308305	AGAP3	116988	14.7724	13.466	8.45386	11.0185	-0.4379	0.003852	0.0399464	Down-regulated
NM_001199	BMP1	649	20.2934	20.6349	14.6182	14.6779	-0.4375	1.25E-05	0.0005094	Down-regulated
NM_001145106	FIBCD1	84929	23.4246	16.9123	13.7387	14.108	-0.4366	0.003666	0.0386359	Down-regulated
NM_001282142	TFE3	7030	31.3551	26.3884	20.9439	20.2727	-0.4356	5.60E-05	0.0016561	Down-regulated
NM_002406	MGAT1	4245	67.4443	50.9261	40.7857	42.6592	-0.4355	0.000625	0.0109094	Down-regulated
NM_024876	COQ8B	79934	20.5326	16.8179	12.344	13.8091	-0.4354	0.001472	0.0203301	Down-regulated

NM_001320547	WDR6	11180	15.5803	12.5399	9.24467	10.492	-0.435	0.001378	0.0194258	Down-regulated
NM_001309443	SPARC	6678	31.8123	31.3667	22.728	23.0261	-0.4341	1.29E-08	1.46E-06	Down-regulated
NM_001037806	NCKAP5L	57701	23.3091	18.3827	14.084	15.4121	-0.4339	0.000604	0.0106163	Down-regulated
NM_025241	UBXN6	80700	139.39	126.297	96.9046	95.18	-0.4339	2.05E-09	2.68E-07	Down-regulated
NM_005273	GNB2	2783	182.24	158.826	121.316	124.413	-0.4329	1.39E-07	1.20E-05	Down-regulated
NM_152643	KNDC1	85442	5.4991	4.49221	3.56742	3.44504	-0.4321	0.00196	0.0249077	Down-regulated
NM_006142	SFN	2810	135.644	102.528	78.5492	88.1649	-0.4313	0.001258	0.0182343	Down-regulated
NM_181553	CMTM3	123920	13.3355	12.5225	8.52712	9.46811	-0.4309	0.002797	0.0320288	Down-regulated
NM_004165	RRAD	6236	52.6443	46.7488	36.0731	34.9243	-0.4307	3.59E-05	0.0011991	Down-regulated
NM_001317395	KCTD10	83892	7.53866	7.4232	5.68894	4.83886	-0.4305	0.001667	0.022357	Down-regulated
NM_007284	TWF2	11344	122.371	99.4881	76.0405	82.0853	-0.43	0.000109	0.0028095	Down-regulated
NM_001278212	LRRC20	55222	10.8056	9.80592	7.7836	6.69488	-0.4287	0.002039	0.0256469	Down-regulated
NM_013449	BAZ2A	11176	3.73649	3.93864	2.70792	2.77444	-0.4282	0.000363	0.0071283	Down-regulated
NM_016538	SIRT7	51547	55.7865	40.9951	33.7422	33.8609	-0.428	0.002689	0.0311153	Down-regulated
NM_002017	FLI1	2313	11.6855	11.0082	7.77572	8.50169	-0.4276	0.000156	0.0037024	Down-regulated
NM_019009	TOLLIP	54472	34.4225	24.5556	20.0947	21.1721	-0.4271	0.003354	0.0362841	Down-regulated
NM_201380	PLEC	5339	8.64818	9.01147	6.38068	6.50458	-0.427	2.06E-08	2.27E-06	Down-regulated
NM_194278	ELMSAN1	91748	11.1133	9.62857	7.62563	7.32847	-0.4269	4.04E-05	0.0013058	Down-regulated
NM_001009880	KIAA0930	23313	18.6362	17.4025	13.7642	12.3413	-0.4261	6.98E-06	0.0003095	Down-regulated
NM_001848	COL6A1	1291	289.215	233.97	181.981	196.287	-0.4254	1.32E-05	0.0005353	Down-regulated
NM_001105079	FBRS	64319	24.4019	20.2066	15.3536	16.611	-0.4254	0.000242	0.0052271	Down-regulated
NM_024050	DDA1	79016	20.418	17.6387	13.5335	13.9009	-0.4247	5.87E-05	0.0017202	Down-regulated
NM_002332	LRP1	4035	31.6985	35.6165	25.0602	24.086	-0.4246	1.41E-07	1.20E-05	Down-regulated
NM_030973	MED25	81857	37.5517	28.2669	23.0169	23.4097	-0.4231	0.002239	0.0275282	Down-regulated
NM_145015	MRGPRF	116535	90.157	73.0897	56.8214	60.5499	-0.4221	0.000125	0.003125	Down-regulated
NM_020066	FMN2	56776	4.13706	4.0123	2.89827	2.92283	-0.4215	0.001225	0.0178702	Down-regulated
NM_014901	RNF44	22838	15.8434	13.9005	9.90994	11.4136	-0.4213	0.000481	0.0087958	Down-regulated
NM_052920	KLHL29	114818	21.1856	15.7927	12.7304	13.4618	-0.4212	0.002269	0.0278018	Down-regulated
NM_001142641	FBRSL1	57666	19.546	15.4449	11.3321	13.4474	-0.4204	0.002426	0.0290799	Down-regulated
NM_030645	SH3BP5L	80851	18.8299	15.7498	12.9654	11.7371	-0.4201	0.00093	0.0146586	Down-regulated
NM_198488	FAM83H	286077	50.3451	38.9916	30.803	33.3945	-0.4201	0.00041	0.0077816	Down-regulated
NM_002133	HMOX1	3162	15.1741	14.0864	10.5415	9.98498	-0.4196	0.004443	0.04445	Down-regulated
NM_152892	LRWD1	222229	18.6835	16.1525	12.0773	12.7586	-0.4195	0.001019	0.0155593	Down-regulated
NM_001261403	NFKB2	4791	12.7391	13.4915	9.60441	9.28047	-0.4194	0.000261	0.0055492	Down-regulated
NM_001699	AXL	558	33.6066	33.4168	24.0567	25.1147	-0.4194	2.37E-09	3.07E-07	Down-regulated
NM_022489	INF2	64423	66	49.6294	40.5613	42.3166	-0.4193	0.000658	0.0113579	Down-regulated
NM_004140	LLGL1	3996	30.5324	27.4179	21.2231	21.0718	-0.419	1.26E-06	7.67E-05	Down-regulated
NM_003887	ASAP2	8853	16.5507	17.0103	12.7935	11.6784	-0.4187	6.67E-06	0.0003004	Down-regulated
NM_001128636	ELFN1	392617	61.4496	46.6827	36.6007	40.6847	-0.4186	0.001058	0.0160321	Down-regulated
NM_134323	TARBP2	6895	32.2936	24.9088	19.4406	20.8742	-0.4179	0.003295	0.0357844	Down-regulated
NM_004064	CDKN1B	1027	32.7702	30.8639	23.005	23.351	-0.4178	2.91E-06	0.000156	Down-regulated
NM_052839	PANX2	56666	15.1815	12.3921	9.66851	9.96052	-0.4178	0.001781	0.0234509	Down-regulated
NM_145040	PRKCDBP	112464	103.788	79.461	63.8455	65.6464	-0.417	0.001693	0.0225904	Down-regulated
NM_006034	TP53I11	9537	12.7056	13.0896	9.59897	9.04241	-0.4167	0.000214	0.0047598	Down-regulated
NM_001409	MEGF6	1953	63.4755	45.9509	37.6077	40.6755	-0.4167	0.001362	0.0192513	Down-regulated
NM_032038	SPNS1	83985	31.0388	24.0556	20.8999	17.9161	-0.4161	0.004215	0.0427763	Down-regulated
NM_002861	PCYT2	5833	11.4214	9.94225	8.12456	7.06253	-0.4159	0.002679	0.0310675	Down-regulated
NM_005194	CEBPB	1051	251.649	199.038	149.277	174.803	-0.4158	0.000412	0.0078044	Down-regulated
NM_030927	TSPAN14	81619	14.7661	14.8347	10.6537	11.0514	-0.4142	1.45E-06	8.45E-05	Down-regulated
NM_004281	BAG3	9531	34.1149	30.7837	22.8214	24.4259	-0.4142	2.76E-05	0.0009975	Down-regulated
NM_006779	CDC42EP2	10435	73.4075	59.0444	45.4193	49.903	-0.4136	0.000523	0.0094591	Down-regulated
NM_005929	MELTF	4241	227.637	174.478	140.241	150.984	-0.4133	0.000241	0.0052176	Down-regulated
NM_014365	HSPB8	26353	60.0554	52.9262	40.1153	42.1973	-0.4126	1.64E-05	0.0006379	Down-regulated
NM_004431	EPHA2	1969	150.65	131.177	99.6561	107.547	-0.4109	4.37E-07	3.05E-05	Down-regulated
NM_152833	C9orf69	90120	40.7413	31.9614	25.6005	26.7405	-0.4102	0.001022	0.0155699	Down-regulated
NM_004218	RAB11B	9230	84.6132	74.0638	56.4447	59.2804	-0.4094	1.69E-05	0.0006504	Down-regulated
NM_001002909	GPATCH8	23131	7.78087	6.89956	5.43044	5.26526	-0.4093	0.000216	0.0047679	Down-regulated
NM_001085460	CTNND1	1500	14.7364	12.2993	9.7511	9.92677	-0.4088	0.000255	0.0054437	Down-regulated

NM_130854	PTPRS	5802	23.2151	21.5975	15.8456	17.2114	-0.4085	5.39E-07	3.72E-05	Down-regulated
NM_014216	ITPK1	3705	69.5498	60.1551	45.3397	49.7229	-0.4083	1.60E-05	0.0006309	Down-regulated
NM_174983	MFSD12	126321	40.1968	30.8229	24.7447	26.0793	-0.407	0.002703	0.0311758	Down-regulated
NM_004954	MARK2	2011	11.3909	11.1027	7.95234	8.50499	-0.4067	9.54E-05	0.0025235	Down-regulated
NM_019015	CHPF2	54480	33.7514	26.333	21.9626	21.5421	-0.4057	0.000994	0.0153233	Down-regulated
NM_015048	SETD1B	23067	7.33529	6.26429	4.82537	5.0863	-0.405	0.000515	0.0093386	Down-regulated
NM_201446	EGFL7	51162	105.853	79.1195	64.2554	67.8721	-0.4039	0.002804	0.0320368	Down-regulated
NM_024496	IRF2BPL	64207	33.0879	25.3953	20.5511	21.7344	-0.4038	0.001608	0.0217415	Down-regulated
NM_178820	FBXO27	126433	12.8078	11.4515	8.05088	9.23809	-0.4036	0.00482	0.0468785	Down-regulated
NM_001012761	RGMB	285704	6.83492	7.86267	5.41237	5.20475	-0.4013	0.002905	0.0326965	Down-regulated
NM_012155	EML2	24139	21.5393	17.9531	15.0128	13.4043	-0.4004	0.002963	0.0330204	Down-regulated
NM_001130144	LTBP3	4054	98.8077	76.8681	61.9497	66.6295	-0.3998	0.00039	0.0074975	Down-regulated
NM_004706	ARHGEF1	9138	39.3174	31.7963	23.8123	27.7815	-0.3994	0.001683	0.0224839	Down-regulated
NM_032575	GLIS2	84662	33.7961	27.0785	20.4042	23.7492	-0.3992	0.00192	0.0245376	Down-regulated
NM_001025434	NQO1	1728	13.9184	14.0028	9.92052	10.4085	-0.3991	0.000979	0.0151799	Down-regulated
NM_030930	UNC93B1	81622	65.6084	49.1539	40.5009	42.3697	-0.399	0.002584	0.0303289	Down-regulated
NM_001012614	CTBP1	1487	65.0335	53.5945	41.7487	45.1166	-0.3986	0.000288	0.0059803	Down-regulated
NM_004451	ESRRA	2101	19.5871	16.8099	11.8981	14.2524	-0.3982	0.0047	0.0461632	Down-regulated
NM_006005	WFS1	7466	8.9358	9.4652	5.98652	7.26881	-0.398	0.005042	0.0485793	Down-regulated
NM_019112	ABCA7	10347	7.26334	6.37561	5.07566	4.91718	-0.3978	0.000585	0.010403	Down-regulated
NM_138368	AP5B1	91056	14.2604	10.5154	8.72255	9.11394	-0.3973	0.005043	0.0485793	Down-regulated
NM_014567	BCAR1	9564	88.5428	66.2418	50.8522	60.899	-0.397	0.003652	0.0385267	Down-regulated
NM_198291	SRC	6714	17.9978	15.5564	11.8151	12.8166	-0.3968	0.000422	0.0079677	Down-regulated
NM_001164446	C6orf132	647024	14.3952	11.5263	8.65728	10.1489	-0.3967	0.002844	0.0323614	Down-regulated
NM_178167	ZNF598	90850	41.1895	30.8362	24.4083	27.5533	-0.3967	0.004103	0.0419101	Down-regulated
NM_001199698	BAG6	7917	29.9088	29.3909	21.8383	22.2899	-0.396	3.44E-07	2.57E-05	Down-regulated
NM_014786	ARHGEF17	9828	32.4391	25.1718	19.963	22.1666	-0.3958	0.001121	0.0166712	Down-regulated
NM_022450	RHBDF1	64285	28.2588	22.1251	17.4249	19.086	-0.3953	0.00292	0.0327747	Down-regulated
NM_030783	PTDSS2	81490	20.1767	18.0714	13.6318	14.4013	-0.395	0.000597	0.0105288	Down-regulated
NM_001322841	ABR	29	38.0298	32.4427	23.5407	28.2451	-0.3947	0.000558	0.010015	Down-regulated
NM_000693	ALDH1A3	220	1441.27	1445.95	1080.58	1087.9	-0.3944	3.30E-27	3.29E-24	Down-regulated
NM_021005	NR2F2	7026	35.413	34.1766	23.8287	27.7798	-0.394	3.30E-05	0.0011369	Down-regulated
NM_018639	WSB2	55884	35.1144	34.4895	25.6098	26.1597	-0.3939	8.88E-07	5.73E-05	Down-regulated
NM_014643	ZNF516	9658	5.163	4.93053	3.58618	3.86895	-0.3918	0.00039	0.0074975	Down-regulated
NM_001318734	KLC2	64837	12.2626	11.3453	8.22267	9.03939	-0.3904	0.00189	0.0243314	Down-regulated
NM_001256183	ANKRD11	29123	17.1046	14.5951	11.6094	11.9626	-0.39	5.25E-05	0.0015894	Down-regulated
NM_005115	MVP	9961	112.862	96.6982	74.2558	81.488	-0.3889	3.10E-05	0.0010865	Down-regulated
NM_138420	AHNAK2	113146	6.25057	6.04919	4.7985	4.39752	-0.3889	6.39E-06	0.0002911	Down-regulated
NM_000202	IDS	3423	6.22364	6.91825	5.12127	4.5553	-0.3877	0.001623	0.0218997	Down-regulated
NM_012121	CDC42EP4	23580	50.5854	38.2043	32.3767	32.5401	-0.3875	0.002689	0.0311153	Down-regulated
NM_017546	CNOT11	55571	42.7413	38.1157	29.0139	31.0771	-0.3865	6.51E-05	0.0018612	Down-regulated
NM_001001852	PIM3	415116	37.9747	30.0563	23.6743	26.0282	-0.3862	0.002971	0.0330514	Down-regulated
NM_002052	GATA4	2626	10.6952	9.94621	6.97289	8.14043	-0.3853	0.003501	0.0374661	Down-regulated
NM_053056	CCND1	595	123.612	124.55	92.0089	95.2979	-0.3852	2.79E-14	9.56E-12	Down-regulated
NM_001136044	TMUB1	83590	69.8788	57.4958	42.2871	50.2951	-0.3848	0.003742	0.0392064	Down-regulated
NM_012292	ARHGAP45	23526	42.4654	34.801	27.6365	29.7868	-0.3841	0.00029	0.0060045	Down-regulated
NM_006482	DYRK2	8445	5.06747	4.36834	3.52433	3.36551	-0.384	0.004855	0.0471378	Down-regulated
NM_012288	TRAM2	9697	23.8388	26.0951	19.0094	18.4679	-0.3839	4.90E-06	0.0002394	Down-regulated
NM_001014447	CPZ	8532	15.0324	14.1421	10.2918	11.0902	-0.3839	0.002307	0.0280884	Down-regulated
NM_002608	PDGFB	5155	10.5352	9.57837	6.9619	7.84503	-0.3838	0.002319	0.02814	Down-regulated
NM_013403	STRN4	29888	38.7366	30.8198	24.4997	26.7159	-0.3834	0.001819	0.0237779	Down-regulated
NM_001198801	EIF4G3	8672	10.1063	8.6877	7.48485	6.3536	-0.3825	0.00285	0.0323689	Down-regulated
NM_014856	DENND4B	9909	10.421	9.16715	6.85758	7.65977	-0.3822	0.001101	0.0164902	Down-regulated
NM_001039673	YIF1B	90522	13.0126	11.4942	8.4721	9.4829	-0.382	0.004271	0.043239	Down-regulated
NM_002081	GPC1	2817	90.1043	73.4369	58.9516	62.8448	-0.382	0.000202	0.0045439	Down-regulated
NM_006795	EHD1	10938	174.829	156.263	122.168	127.284	-0.3812	3.03E-08	3.20E-06	Down-regulated
NM_079834	SCAMP4	113178	37.2763	31.833	25.5584	25.8611	-0.381	0.00026	0.0055419	Down-regulated

NM_016368	ISYNA1	51477	154.943	117.755	95.3132	105.617	-0.3809	0.001898	0.0243823	Down-regulated
NM_024682	TBC1D17	79735	23.7486	20.112	16.6317	15.7351	-0.3798	0.001842	0.0238361	Down-regulated
NM_001959	EEF1B2	1933	36.2922	34.2294	26.5974	25.1838	-0.3782	0.002176	0.0268446	Down-regulated
NM_018955	UBB	7314	932.885	854.999	616.593	719.076	-0.3774	1.17E-05	0.0004835	Down-regulated
NM_001098424	DLG1	1739	14.8079	12.6603	10.9683	9.33936	-0.3772	0.002894	0.0326416	Down-regulated
NM_015177	DTX4	23220	12.9706	11.1757	9.05193	8.97605	-0.3771	0.000447	0.0082898	Down-regulated
NM_002419	MAP3K11	4296	33.0848	26.4651	21.0772	23.0428	-0.3761	0.002158	0.0267059	Down-regulated
NM_012478	WBP2	23558	108.996	95.6984	73.6892	79.7479	-0.3757	3.33E-05	0.0011423	Down-regulated
NM_002659	PLAUR	5329	55.5411	57.6033	43.6323	41.0421	-0.3755	6.87E-05	0.0019442	Down-regulated
NM_001193524	FAM65A	79567	37.4035	36.2641	23.7005	30.8636	-0.3755	0.002895	0.0326416	Down-regulated
NM_182943	PLOD2	5352	93.8106	104.852	74.6849	75.4065	-0.3752	2.35E-06	0.0001306	Down-regulated
NM_017999	RNF31	55072	22.7074	19.0692	14.8309	16.2502	-0.3746	0.001455	0.0201547	Down-regulated
NM_000602	SERPINE1	5054	901.241	1008.37	736.936	707.622	-0.3746	4.24E-07	3.01E-05	Down-regulated
NM_031459	SESN2	83667	31.8755	26.4114	21.4753	22.0488	-0.3745	0.000673	0.0115432	Down-regulated
NM_006455	P3H4	10609	18.0263	16.1477	13.0173	12.4419	-0.3731	0.001319	0.0188591	Down-regulated
NM_024832	RIN3	79890	15.8607	14.8682	10.6132	12.3356	-0.3718	0.001262	0.0182343	Down-regulated
NM_001080453	INTS1	26173	80.5864	57.4495	49.5025	52.7022	-0.3712	0.004764	0.0466291	Down-regulated
NM_003330	TXNRD1	7296	105.877	108.663	80.0507	83.343	-0.3709	5.76E-11	1.22E-08	Down-regulated
NM_022767	AEN	64782	36.6395	31.9592	26.1438	25.5096	-0.3701	0.00013	0.0031996	Down-regulated
NM_031450	C11orf68	83638	40.9078	35.332	27.5411	29.232	-0.3687	0.001479	0.0204019	Down-regulated
NM_182838	SLC35E2	9906	12.3219	11.7764	9.27502	8.98583	-0.3675	3.30E-05	0.0011369	Down-regulated
NM_020338	ZMIZ1	57178	21.2258	21.5589	16.632	15.9682	-0.3672	2.35E-07	1.87E-05	Down-regulated
NM_001321463	NCLN	56926	20.7378	16.7269	14.4586	13.433	-0.3667	0.003686	0.0387662	Down-regulated
NR_033403	BMP1	649	10.6354	9.64623	7.92972	7.2118	-0.3663	0.002802	0.0320368	Down-regulated
NM_005257	GATA6	2627	70.6386	59.2467	47.0177	50.991	-0.3663	0.00022	0.0048307	Down-regulated
NM_030665	RAI1	10743	35.7358	28.1617	22.1981	25.6093	-0.3661	0.002585	0.0303289	Down-regulated
NM_001330520	TNRC6A	27327	10.174	10.9045	7.9471	8.05545	-0.3655	6.13E-05	0.0017664	Down-regulated
NM_006039	MRC2	9902	79.0541	65.2349	53.9438	55.3682	-0.365	9.79E-05	0.0025732	Down-regulated
NM_145109	MAP2K3	5606	36.5507	36.5295	27.1155	28.2886	-0.3646	3.00E-05	0.001066	Down-regulated
NM_001195733	PIP5K1C	23396	7.22322	6.3096	4.92039	5.17112	-0.3641	0.004482	0.0446011	Down-regulated
NM_033238	PML	5371	6.50588	6.26339	4.5358	5.03617	-0.364	0.002733	0.0313927	Down-regulated
NM_004560	ROR2	4920	12.5042	11.216	8.96759	8.90767	-0.3631	0.000954	0.0149462	Down-regulated
NM_002428	MMP15	4324	43.7282	34.708	27.9008	30.9165	-0.3629	0.002381	0.0286702	Down-regulated
NM_032804	ADO	84890	15.4215	12.4511	10.495	10.2832	-0.3626	0.00513	0.049067	Down-regulated
NM_202468	GIPC1	10755	63.9369	65.1636	48.3044	49.8585	-0.3617	5.08E-06	0.0002435	Down-regulated
NM_078480	PUF60	22827	23.2978	24.0548	18.2781	17.3554	-0.3603	0.001293	0.0185541	Down-regulated
NM_015627	LDLRAP1	26119	13.8476	12.4338	9.73773	9.99797	-0.3601	0.002573	0.0303289	Down-regulated
NM_002480	PPP1R12A	4659	13.2448	13.2957	10.222	10.0117	-0.36	3.65E-05	0.0012059	Down-regulated
NM_001170718	BCAR1	9564	42.9912	37.9229	30.2706	31.288	-0.3593	6.62E-05	0.0018834	Down-regulated
NM_006598	SLC12A7	10723	18.1895	15.4048	12.5159	12.922	-0.3586	0.000808	0.0131375	Down-regulated
NM_030775	WNT5B	81029	36.1327	29.6819	25.2306	24.18	-0.3579	0.002937	0.0329128	Down-regulated
NM_003900	SQSTM1	8878	1288.93	1182.95	954.066	944.835	-0.3576	5.43E-12	1.33E-09	Down-regulated
NM_002403	MFAP2	4237	81.1977	68.8862	56.9533	55.57	-0.3572	0.001278	0.0183619	Down-regulated
NM_004995	MMP14	4323	58.7411	52.2931	42.1617	42.7511	-0.3567	7.63E-06	0.0003326	Down-regulated
NM_001127173	CADM3	57863	51.4179	46.4272	37.5251	37.3693	-0.3564	3.56E-06	0.0001851	Down-regulated
NM_004712	HGS	9146	103.213	80.6598	65.5039	73.0127	-0.3563	0.002615	0.0306007	Down-regulated
NM_004756	NUMBL	9253	14.7318	12.3265	10.2784	10.0656	-0.356	0.004	0.041163	Down-regulated
NM_001425	EMP3	2014	241.233	205.544	160.087	174.654	-0.3559	0.000483	0.0088283	Down-regulated
NM_024417	FDXR	2232	102.176	81.0079	69.2502	68.7392	-0.3559	0.001818	0.0237779	Down-regulated
NM_001013251	SLC3A2	6520	277.466	252.879	198.257	207.851	-0.3558	4.78E-08	4.60E-06	Down-regulated
NM_177939	P4HTM	54681	55.2134	46.9348	38.4541	39.0124	-0.3549	0.000564	0.0100928	Down-regulated
NM_138795	ARL8A	127829	30.5391	29.1307	23.709	21.4077	-0.354	0.001439	0.0199721	Down-regulated
NM_002521	NPPB	4879	1160.01	1039.08	816.953	843.4	-0.354	3.99E-08	3.99E-06	Down-regulated
NM_003153	STAT6	6778	49.4652	41.0805	34.56	34.3861	-0.3535	0.000435	0.0081149	Down-regulated
NM_001143963	L1CAM	3897	37.3334	30.9424	27.2799	24.6146	-0.3519	0.001338	0.0190322	Down-regulated
NM_130445	COL18A1	80781	118.965	98.8831	81.0436	85.7577	-0.3513	0.00012	0.0030147	Down-regulated
NM_018071	ARHGEF40	55701	7.96136	7.06532	5.51248	5.88485	-0.3512	0.002549	0.0301679	Down-regulated

NM_001301076	AP2S1	1175	69.6743	76.5359	52.2007	57.2323	-0.3499	0.003936	0.0406935	Down-regulated
NM_001177355	MSLN	10232	76.7763	65.318	51.0881	56.9522	-0.3493	0.001013	0.0154863	Down-regulated
NM_153265	EML3	256364	28.5704	23.5505	18.5327	20.8919	-0.3487	0.004476	0.0446011	Down-regulated
NM_001010972	ZYX	7791	138.605	127.98	95.4128	109.046	-0.3476	6.90E-05	0.0019442	Down-regulated
NM_005186	CAPN1	823	96.2843	82.5297	65.9896	71.1052	-0.3476	0.000146	0.0035063	Down-regulated
NM_000581	GPX1	2876	554.172	457.243	374.428	395.684	-0.3462	0.0002	0.0045233	Down-regulated
NM_003482	KMT2D	8085	10.3677	9.6641	7.75819	7.75859	-0.346	3.03E-07	2.34E-05	Down-regulated
NM_006949	STXBP2	6813	99.9318	83.2467	68.381	71.4033	-0.3456	0.0007	0.0118952	Down-regulated
NM_001289984	JADE2	23338	9.93445	11.2164	8.58813	7.52633	-0.3444	0.00414	0.0421349	Down-regulated
NM_002886	RAP2B	5912	8.5703	8.24494	6.14619	6.7879	-0.3441	0.000454	0.0084147	Down-regulated
NM_006317	BASP1	10409	238.755	217.608	175.305	177.251	-0.3439	5.02E-08	4.80E-06	Down-regulated
NM_005597	NFIC	4782	13.0966	14.9523	10.1708	11.3216	-0.3434	0.001794	0.0235868	Down-regulated
NM_001098833	ATXN7L3	56970	20.9292	18.502	14.464	15.7056	-0.3434	0.001327	0.01894	Down-regulated
NM_001017987	MRNIP	51149	120.66	122.294	96.3272	89.3489	-0.3429	8.87E-05	0.002377	Down-regulated
NM_001080826	SGK223	157285	12.5412	10.8879	8.58309	9.30593	-0.3425	0.003058	0.0337563	Down-regulated
NM_153271	SNX33	257364	33.8992	31.1668	25.9389	24.1922	-0.342	0.000157	0.0037158	Down-regulated
NM_016352	CPA4	51200	384.532	392.877	303.405	301.399	-0.3414	5.25E-14	1.69E-11	Down-regulated
NM_002579	PALM	5064	16.2361	15.4912	11.6391	12.6399	-0.3405	0.002199	0.0271041	Down-regulated
NM_153828	RTN4	57142	600.162	538.833	434.944	448.459	-0.3404	3.87E-08	3.90E-06	Down-regulated
NM_005082	TRIM25	7706	42.4346	43.4016	33.1827	33.6248	-0.3399	2.17E-08	2.33E-06	Down-regulated
NM_001940	ATN1	1822	48.162	41.6219	33.3971	35.89	-0.3395	0.000255	0.0054437	Down-regulated
NM_173689	CRB2	286204	50.873	43.4017	33.7737	38.9013	-0.3368	0.001165	0.0171747	Down-regulated
NM_001127392	MYRF	745	133.81	120.089	97.5288	100.365	-0.3365	1.97E-07	1.59E-05	Down-regulated
NM_024698	SLC25A22	79751	31.217	26.2983	22.1498	22.0428	-0.3353	0.002325	0.0281751	Down-regulated
NM_001289823	FURIN	5045	43.5994	38.7872	30.7437	33.1488	-0.335	0.000139	0.0033958	Down-regulated
NM_053279	FAM167A	83648	31.01	27.8004	22.9623	22.6633	-0.3346	0.000114	0.002913	Down-regulated
NM_002826	QSOX1	5768	212.264	181.006	153.635	151.812	-0.3342	3.41E-05	0.0011591	Down-regulated
NM_015894	STMN3	50861	104.83	86.4818	68.2593	78.6058	-0.3341	0.002952	0.0329444	Down-regulated
NM_015472	WWTR1	25937	10.7522	10.6846	8.09395	8.49578	-0.334	0.000712	0.0119938	Down-regulated
NM_014045	LRP10	26020	60.6083	52.8286	44.0215	44.3197	-0.3339	1.64E-05	0.0006379	Down-regulated
NM_020378	NAT14	57106	96.7848	81.6732	67.2456	69.6428	-0.3339	0.001374	0.0193915	Down-regulated
NM_020898	CALCOCO1	57658	31.1503	28.6566	22.8493	23.5172	-0.3337	0.000164	0.0038649	Down-regulated
NM_004417	DUSP1	1843	403.367	354.984	284.089	304.894	-0.3331	1.05E-05	0.0004429	Down-regulated
NM_003687	PDLIM4	8572	90.2106	71.1737	60.8244	62.9861	-0.3328	0.003764	0.0392934	Down-regulated
NM_032960	MAPKAPK2	9261	24.8027	24.0409	18.7025	19.1918	-0.3324	0.000198	0.0045056	Down-regulated
NM_080388	S100A16	140576	255.591	238.563	193.997	189.423	-0.3322	1.52E-07	1.27E-05	Down-regulated
NM_001846	COL4A2	1284	192.959	186.678	145.803	152.057	-0.3321	2.01E-13	5.97E-11	Down-regulated
NM_003898	SYNJ2	8871	8.23508	8.54739	6.87576	6.09768	-0.3313	0.002318	0.02814	Down-regulated
NM_001042545	LTBP4	8425	14.301	12.6969	10.6537	10.2932	-0.3281	0.001438	0.0199721	Down-regulated
NM_001183	ATP6AP1	537	123.844	106.569	88.0024	91.2189	-0.3268	0.000201	0.0045323	Down-regulated
NM_014727	KMT2B	9757	9.77203	8.62438	6.90255	7.41258	-0.3251	0.001582	0.0214484	Down-regulated
NM_000101	CYBA	1535	1003.6	781.643	644.038	714.767	-0.3236	0.003858	0.0399605	Down-regulated
NM_014516	CNOT3	4849	33.7605	30.2748	24.1161	25.7853	-0.3231	0.000824	0.0133239	Down-regulated
NM_019058	DDIT4	54541	143.91	120.202	100.413	105.063	-0.321	0.000999	0.0153666	Down-regulated
NM_005729	PPIF	10105	88.3842	94.9678	71.4807	72.3072	-0.321	3.45E-05	0.0011652	Down-regulated
NM_024598	USB1	79650	22.2681	20.9018	17.524	15.9574	-0.3202	0.004275	0.043239	Down-regulated
NM_024321	RBM42	79171	84.9345	73.7427	61.2541	62.4212	-0.32	0.000615	0.0107642	Down-regulated
NM_002705	PPL	5493	52.2291	52.931	39.8963	43.081	-0.3198	1.21E-06	7.57E-05	Down-regulated
NM_001099409	EHBP1L1	254102	28.688	25.6497	20.6428	21.9832	-0.3197	0.000284	0.0059152	Down-regulated
NM_014030	GIT1	28964	35.2851	30.9528	25.889	26.0021	-0.3189	0.000476	0.0087207	Down-regulated
NM_003370	VASP	7408	50.4264	42.4477	34.9036	37.3274	-0.3186	0.003305	0.0358664	Down-regulated
NM_021035	ZNFX1	57169	15.8468	18.1854	13.6919	12.9399	-0.3184	0.002116	0.0262791	Down-regulated
NM_006029	PNMA1	9240	71.7446	64.7113	53.7375	53.5147	-0.318	4.21E-05	0.0013395	Down-regulated
NM_018426	TMEM63B	55362	24.9318	22.227	18.2082	18.705	-0.3169	0.001233	0.0179625	Down-regulated
NM_006096	NDRG1	10397	59.6719	58.0538	45.724	47.1887	-0.3166	1.48E-06	8.56E-05	Down-regulated
NM_020746	MAVS	57506	8.25007	7.51693	6.53684	5.82433	-0.3161	0.001936	0.0246381	Down-regulated
NM_005819	STX6	10228	8.57882	8.18542	6.56344	6.56463	-0.3141	0.003334	0.0361037	Down-regulated
NM_002821	PTK7	5754	27.8705	28.7056	21.6933	22.9593	-0.3136	0.000105	0.002723	Down-regulated

NM_153827	MINK1	50488	29.0403	23.741	20.9246	20.3612	-0.3136	0.004177	0.0424718	Down-regulated
NM_000637	GSR	2936	46.7964	49.643	38.567	37.5533	-0.3135	7.58E-05	0.0020923	Down-regulated
NM_001303614	SAMD4B	55095	13.5686	12.8807	10.0747	10.6476	-0.3132	0.003377	0.0364205	Down-regulated
NM_015318	ARHGEF18	23370	20.812	17.3945	14.6158	15.3006	-0.3129	0.004004	0.0411719	Down-regulated
NM_002335	LRP5	4041	23.0398	19.4773	16.0457	17.2787	-0.3123	0.003468	0.0371927	Down-regulated
NM_023106	FGFR1	2260	28.3286	27.3246	21.8392	22.2844	-0.3119	3.96E-06	0.0002031	Down-regulated
NM_005990	STK10	6793	17.4138	15.5137	13.1553	12.8084	-0.3116	0.000736	0.0122899	Down-regulated
NM_018067	MAP7D1	55700	21.8854	18.7939	16.4151	15.4505	-0.3112	0.004699	0.0461632	Down-regulated
NM_006698	BLCAP	10904	50.9477	50.4579	40.0868	39.9181	-0.3111	7.89E-05	0.0021594	Down-regulated
NM_002631	PGD	5226	112.009	112.185	88.5828	89.2676	-0.31	8.45E-08	7.80E-06	Down-regulated
NM_006470	TRIM16	10626	32.7284	35.2707	27.4481	26.182	-0.3088	0.00097	0.0150813	Down-regulated
NM_022060	ABHD4	63874	35.9009	34.8692	27.2447	28.6727	-0.3084	0.000334	0.006735	Down-regulated
NM_024519	FAM65A	79567	78.3914	69.6237	59.3603	58.0765	-0.3075	4.12E-05	0.0013178	Down-regulated
NM_003969	UBE2M	9040	154.123	124.907	109.113	109.432	-0.3063	0.003651	0.0385267	Down-regulated
NM_138761	BAX	581	190.824	181.662	142.634	148.824	-0.3061	0.000123	0.0030921	Down-regulated
NM_182683	UPK3B	80761	252.805	208.491	185.665	176.67	-0.3056	0.001702	0.0226488	Down-regulated
NM_001122681	SH3BP2	6452	6.2671	5.66679	4.66483	4.76032	-0.3053	0.003272	0.0356443	Down-regulated
NM_021173	POLD4	57804	37.5478	34.366	28.6088	27.9643	-0.3042	0.002588	0.0303321	Down-regulated
NM_017556	FBLIM1	54751	70.6114	68.7304	53.9718	57.0726	-0.304	2.65E-06	0.0001436	Down-regulated
NM_002309	LIF	3976	50.3477	42.0134	36.4757	36.5102	-0.3039	0.002074	0.0259044	Down-regulated
NM_014654	SDC3	9672	10.9522	10.4448	8.42586	8.51576	-0.3037	0.001828	0.0238073	Down-regulated
NM_000528	MAN2B1	4125	95.0488	83.7321	70.3349	71.7186	-0.3037	9.24E-05	0.0024583	Down-regulated
NM_032989	BAD	572	116.895	101.25	84.8705	85.8408	-0.3028	0.002541	0.0301365	Down-regulated
NR_046235	RNA45S5	1E+08	858.591	1022.72	689.845	799.617	-0.3026	0.004436	0.0444425	Down-regulated
NM_003954	MAP3K14	9020	20.9667	19.5416	15.4546	16.6873	-0.302	0.00094	0.014762	Down-regulated
NM_033386	MICALL1	85377	31.0073	28.0897	22.6442	24.3412	-0.301	0.000595	0.0105059	Down-regulated
NM_001320034	GRAMD1A	57655	33.9125	34.5435	26.8017	27.6217	-0.3006	0.000385	0.0074426	Down-regulated
NM_080686	PRRC2A	7916	41.092	36.7256	30.5586	31.5528	-0.3006	5.97E-05	0.0017383	Down-regulated
NM_175866	UHMK1	127933	18.3765	20.5162	15.5017	15.4869	-0.2999	0.000713	0.0119938	Down-regulated
NM_012401	PLXNB2	23654	132.257	117.612	97.4171	102.422	-0.2991	1.68E-05	0.0006476	Down-regulated
NM_017758	ALKBH5	54890	26.998	23.6285	20.0492	20.1187	-0.2983	0.00253	0.0300364	Down-regulated
NM_018677	ACSS2	55902	21.8233	21.4773	17.5697	16.8473	-0.2976	0.001547	0.0210744	Down-regulated
NM_016201	AMOTL2	51421	73.1166	69.8158	55.0498	59.4912	-0.2972	5.41E-06	0.000256	Down-regulated
NM_003118	SPARC	6678	1172.28	1219	948.458	972.576	-0.2964	1.20E-09	1.73E-07	Down-regulated
NM_005902	SMAD3	4088	136.826	145.427	113.642	113.155	-0.2962	2.86E-07	2.23E-05	Down-regulated
NM_000158	GBE1	2632	54.279	56.5087	46.1631	42.2741	-0.2961	0.000375	0.0073085	Down-regulated
NM_013279	MYRF	745	84.3709	74.5296	62.8879	64.3857	-0.2959	4.42E-05	0.0013852	Down-regulated
NM_001709	BDNF	627	17.8428	18.8775	14.0661	15.1589	-0.2959	0.002728	0.0313648	Down-regulated
NM_000189	HK2	3099	16.8378	16.8161	13.7421	13.23	-0.2949	9.46E-05	0.002509	Down-regulated
NM_002473	MYH9	4627	282.9	288.444	225.269	234.982	-0.2949	2.38E-10	4.21E-08	Down-regulated
NM_012088	PGLS	25796	90.0122	88.7342	71.575	70.0409	-0.2932	0.000797	0.0130259	Down-regulated
NM_018425	PI4K2A	55361	12.2137	12.1301	9.59274	9.82024	-0.293	0.003294	0.0357844	Down-regulated
NR_073024	RPL13A	23521	107.407	97.1623	76.7923	85.1295	-0.2927	0.002941	0.032918	Down-regulated
NM_001329451	KANK2	25959	12.4826	12.2693	9.38157	10.3761	-0.2915	0.003774	0.039356	Down-regulated
NM_001184977	UQCC1	55245	35.4215	36.8659	29.385	28.3532	-0.2905	0.001505	0.0206685	Down-regulated
NM_017582	UBE2Q1	55585	37.9104	34.7687	28.2504	29.956	-0.2901	0.000736	0.0122899	Down-regulated
NM_002859	PXN	5829	84.6843	80.6061	67.6805	65.5208	-0.2897	9.21E-07	5.88E-05	Down-regulated
NM_018201	TBC1D13	54662	12.8492	12.4784	10.2707	9.9561	-0.2895	0.004432	0.0444425	Down-regulated
NM_001008410	STEAP3	55240	14.8723	14.1815	11.6157	11.6484	-0.2872	0.003034	0.0336559	Down-regulated
NM_001113491	9-Sep	10801	271.558	235.298	201.643	206.593	-0.2863	0.00011	0.0028144	Down-regulated
NM_001080950	MYO1C	4641	102.982	93.2265	82.3982	75.7235	-0.286	0.000151	0.003601	Down-regulated
NM_006517	SLC16A2	6567	13.7236	13.2913	10.6822	10.98	-0.2855	0.003145	0.0344352	Down-regulated
NM_022772	EPS8L2	64787	116.549	96.5215	83.867	86.8816	-0.2855	0.002643	0.0308268	Down-regulated
NM_001195483	SLC12A8	84561	26.5202	27.478	21.7689	21.747	-0.2836	0.000756	0.0125782	Down-regulated
NM_004207	SLC16A3	9123	329.773	275.286	239.51	246.102	-0.2835	0.001191	0.017483	Down-regulated
NM_020524	PBXIP1	57326	16.7274	16.8177	13.15	13.7675	-0.2832	0.004389	0.0440953	Down-regulated
NM_006442	DRAP1	10589	481.237	394.122	338.435	357.379	-0.2831	0.003542	0.0376555	Down-regulated

NM_004429	EFNB1	1947	75.1103	62.4302	53.3656	56.9493	-0.2829	0.004699	0.0461632	Down-regulated
NM_001144759	PHLDB1	23187	48.0073	42.028	35.1727	37.4938	-0.2814	0.001009	0.0154511	Down-regulated
NM_006745	MSMO1	6307	60.5183	63.2	50.956	48.8346	-0.281	0.000466	0.0085801	Down-regulated
NM_002276	KRT19	3880	4714.12	4081.26	3406.48	3667.22	-0.2807	0.000249	0.0053669	Down-regulated
NM_005628	SLC1A5	6510	117.596	101.301	84.2777	92.0856	-0.2795	0.002021	0.0254519	Down-regulated
NM_130787	AP2A1	160	57.5195	50.5914	41.8965	45.3041	-0.2793	0.001902	0.0243944	Down-regulated
NM_019884	GSK3A	2931	39.9409	37.9122	30.0302	32.6397	-0.2787	0.002892	0.0326416	Down-regulated
NM_000903	NQO1	1728	154.513	163.538	131.905	125.902	-0.2785	3.39E-05	0.0011573	Down-regulated
NM_002467	MYC	4609	83.634	74.9556	62.5942	65.5127	-0.2781	0.000595	0.0105059	Down-regulated
NM_004996	ABCC1	4363	30.978	32.0275	25.8517	25.3558	-0.2779	2.63E-05	0.0009613	Down-regulated
NM_006015	ARID1A	8289	19.4068	17.815	14.664	15.5368	-0.2773	0.000434	0.0081039	Down-regulated
NM_032387	WNK4	65266	19.2114	19.3103	15.7357	15.4642	-0.2761	0.001171	0.0172326	Down-regulated
NM_001458	FLNC	2318	104.682	99.2929	78.5084	87.5435	-0.2756	5.87E-05	0.0017202	Down-regulated
NM_032466	ASPH	444	48.228	49.1255	40.5875	38.5312	-0.275	0.000106	0.0027484	Down-regulated
NM_022153	C10orf54	64115	28.2741	26.9874	22.4811	22.4538	-0.2749	0.000135	0.0033046	Down-regulated
NM_001018003	SORBS3	10174	78.768	68.2561	57.9615	60.6718	-0.2747	0.003261	0.0355954	Down-regulated
NM_014389	PELP1	27043	17.9377	17.7029	14.0502	14.8338	-0.2729	0.003523	0.0375401	Down-regulated
NM_004095	EIF4EBP1	1978	377.103	325.267	269.714	292.186	-0.2727	0.002649	0.0308434	Down-regulated
NR_135828	LOC101927751	1E+08	688.039	733.278	577.23	582.781	-0.2724	1.23E-06	7.57E-05	Down-regulated
NM_006369	LRRC41	10489	38.7744	38.2699	30.8374	31.8348	-0.2713	0.000385	0.0074426	Down-regulated
NM_183001	SHC1	6464	73.5904	63.2182	54.6683	56.381	-0.2709	0.002018	0.0254519	Down-regulated
NM_004924	ACTN4	81	478.508	418.724	352.968	378.37	-0.2699	0.000271	0.0057318	Down-regulated
NM_014866	SEC16A	9919	8.34404	8.56846	7.02178	6.77572	-0.2676	0.002468	0.0293324	Down-regulated
NM_004718	COX7A2L	9167	126.804	121.992	99.7544	101.985	-0.2671	0.000345	0.0068363	Down-regulated
NM_058243	BRD4	23476	16.3551	16.3622	12.8978	13.7941	-0.2664	0.002312	0.0281136	Down-regulated
NM_002957	RXRA	6256	20.282	18.4968	15.1119	16.5239	-0.2648	0.004355	0.0439185	Down-regulated
NM_001064	TKT	7086	207.952	193.146	159.433	169.1	-0.2625	4.03E-05	0.0013039	Down-regulated
NM_004427	PHC2	1912	80.768	73.2161	60.2307	65.5221	-0.2625	0.001679	0.0224599	Down-regulated
NM_030662	MAP2K2	5605	152.548	131.79	110.746	120.519	-0.2623	0.004403	0.0441996	Down-regulated
NM_003088	FSCN1	6624	347.209	285.387	249.766	266.041	-0.2621	0.004709	0.0462099	Down-regulated
NM_000088	COL1A1	1277	230.174	231.893	187.34	193.625	-0.2617	1.56E-09	2.11E-07	Down-regulated
NM_001037165	FOXK1	221937	13.3381	13.0259	10.6295	11.0578	-0.2612	0.000163	0.0038303	Down-regulated
NM_014521	SH3BP4	23677	20.3463	20.1021	16.9987	16.209	-0.2601	0.001115	0.0166712	Down-regulated
NM_002627	PFKP	5214	90.1275	88.9271	76.3021	70.6637	-0.2596	0.000229	0.0050058	Down-regulated
NM_001130040	SHC1	6464	128.631	110.103	98.6173	97.3329	-0.2572	0.001811	0.0237588	Down-regulated
NM_007260	LYPLA2	11313	60.0822	56.314	45.9239	49.2013	-0.256	0.004791	0.0468098	Down-regulated
NM_002224	ITPR3	3710	28.3185	28.7399	23.8436	23.3376	-0.2557	1.42E-05	0.0005679	Down-regulated
NM_000175	GPI	2821	72.5825	66.0507	58.9496	55.2317	-0.2557	0.000604	0.0106163	Down-regulated
NM_000308	CTSA	5476	56.582	59.3841	47.1402	48.4048	-0.2549	0.000505	0.0092012	Down-regulated
NM_005412	SHMT2	6472	139.079	119.483	105.773	106.597	-0.2537	0.002634	0.0307724	Down-regulated
NM_001131016	CIZ1	25792	38.9374	36.1934	31.305	30.5833	-0.2527	0.001834	0.02381	Down-regulated
NM_002541	OGDH	4967	53.4972	54.3405	43.286	45.9892	-0.2511	0.000183	0.004246	Down-regulated
NM_002292	LAMB2	3913	56.0087	53.5941	44.7895	46.1513	-0.2504	7.56E-06	0.0003306	Down-regulated
NM_033251	RPL13	6137	100.182	84.0956	77.0628	75.0133	-0.249	0.004952	0.0480348	Down-regulated
NM_020448	NIPAL3	57185	19.669	19.2579	16.2979	15.9931	-0.246	0.001266	0.0182458	Down-regulated
NM_001849	COL6A2	1292	76.6455	66.7038	57.8575	60.7426	-0.2458	0.003817	0.039716	Down-regulated
NM_001084	PLOD3	8985	48.5438	43.2089	38.5909	37.4108	-0.243	0.005059	0.048606	Down-regulated
NM_030981	RAB1B	81876	171.02	150.846	127.458	139.141	-0.2409	0.004488	0.0446011	Down-regulated
NM_003681	PDXK	8566	20.8593	21.4815	17.4213	17.9171	-0.2405	0.000655	0.0113189	Down-regulated
NM_006310	NPEPPS	9520	31.2231	31.4634	26.4178	25.839	-0.2404	0.000776	0.0127896	Down-regulated
NM_005572	LMNA	4000	292.944	264.407	219.093	243.674	-0.2397	0.002298	0.0280022	Down-regulated
NM_003979	GPRC5A	9052	536.779	587.541	471.457	466.541	-0.239	0.000292	0.0060232	Down-regulated
NM_000314	PTEN	5728	15.9239	14.649	12.287	13.2158	-0.2374	0.004625	0.0457123	Down-regulated
NM_003768	PEA15	8682	301.973	262.478	236.685	233.781	-0.2364	0.001382	0.0194577	Down-regulated
NM_014330	PPP1R15A	23645	61.3567	61.3825	51.4197	51.1304	-0.2344	0.000762	0.0126457	Down-regulated
NM_139279	MCFD2	90411	67.0734	71.0363	59.5003	56.2298	-0.2328	0.00122	0.0178173	Down-regulated
NM_138373	MYADM	91663	73.6385	68.9083	57.5513	61.8108	-0.2317	0.001545	0.0210744	Down-regulated

NM_006148	LASP1	3927	211.106	190.334	164.277	172.849	-0.2303	0.000418	0.0078948	Down-regulated
NM_014246	CELSR1	9620	9.64315	9.33298	8.04824	7.92013	-0.2277	0.002468	0.0293324	Down-regulated
NM_004309	ARHGDIA	396	204.417	199.972	167.523	172.325	-0.2274	1.39E-05	0.0005573	Down-regulated
NM_015060	AVL9	23080	22.202	22.7766	19.1058	18.7915	-0.2273	0.001009	0.0154511	Down-regulated
NM_001012478	U2AF2	11338	125.957	109.785	97.3333	100.751	-0.2253	0.004276	0.043239	Down-regulated
NM_017590	ZC3H7B	23264	31.8052	28.775	25.6278	25.4785	-0.2228	0.003264	0.0355959	Down-regulated
NM_004599	SREBF2	6721	42.645	38.0711	33.3414	34.7132	-0.2227	0.004665	0.0459874	Down-regulated
NM_017670	OTUB1	55611	47.4479	45.3322	39.4262	38.722	-0.221	0.00505	0.0485988	Down-regulated
NM_001543	NDST1	3340	31.7573	32.8687	26.219	28.4548	-0.221	0.002264	0.0277756	Down-regulated
NM_000820	GAS6	2621	530.292	457.531	408.265	427.405	-0.2154	0.004493	0.0446084	Down-regulated
NM_005918	MDH2	4191	101.275	95.838	80.136	86.9054	-0.213	0.004014	0.0411885	Down-regulated
NM_021913	AXL	558	39.8762	39.5992	32.7637	34.8594	-0.2121	0.002021	0.0254519	Down-regulated
NM_000188	HK1	3098	35.9782	36.7184	31.4199	30.3676	-0.2118	0.004757	0.0465973	Down-regulated
NM_015470	RAB11FIP5	26056	39.6194	36.4593	31.8799	32.9456	-0.2085	0.00518	0.0494631	Down-regulated
NM_003062	SLIT3	6586	13.869	14.1524	11.746	12.1825	-0.2081	0.004114	0.0419497	Down-regulated
NM_139179	DAGLB	221955	62.8742	59.3738	51.6141	52.7558	-0.2054	0.002399	0.028817	Down-regulated
NM_030969	TMEM14B	81853	330.82	329.509	281.337	278.38	-0.2047	0.000353	0.006981	Down-regulated
NM_014343	CLDN15	24146	161.398	151.225	129.481	136.606	-0.2025	0.004516	0.0447943	Down-regulated
NM_001913	CUX1	1523	46.6691	44.5124	38.9046	39.2148	-0.2004	0.0048	0.0468098	Down-regulated
NM_007118	TRIO	7204	36.6081	36.3938	32.1064	30.835	-0.1975	0.000223	0.0048918	Down-regulated
NM_013318	PRRC2B	84726	28.3312	28.6952	24.4707	24.7418	-0.1966	0.00025	0.0053826	Down-regulated
NM_001110556	FLNA	2316	253.862	240.085	206.087	220.427	-0.1948	0.000335	0.006735	Down-regulated
NM_014713	LAPTM4A	9741	98.4928	99.7511	84.9668	85.2183	-0.1942	0.003998	0.041163	Down-regulated
NM_004817	TJP2	9414	41.5496	41.3523	34.9051	36.7535	-0.1903	0.003829	0.0397776	Down-regulated
NM_002628	PFN2	5217	137.719	137.724	121.652	115.743	-0.1894	0.003358	0.0362903	Down-regulated
NM_000527	LDLR	3949	100.187	94.7168	86.8253	82.2972	-0.1863	0.001388	0.0194808	Down-regulated
NM_001143998	SEC14L1	6397	42.0118	42.5578	36.3491	37.1019	-0.1853	0.001868	0.0241018	Down-regulated
NM_002086	GRB2	2885	57.5541	58.2109	49.7767	50.7442	-0.1832	0.004181	0.0424718	Down-regulated
NM_130440	PTPRF	5792	617.879	571.936	504.314	531.525	-0.1828	0.000937	0.0147411	Down-regulated
NM_014868	RNF10	9921	71.1506	68.6746	60.42	61.235	-0.182	0.001119	0.0166712	Down-regulated
NM_004938	DAPK1	1612	51.0787	49.978	44.586	43.4954	-0.1812	0.0008	0.0130612	Down-regulated
NM_002087	GRN	2896	208.78	194.234	173.081	177.485	-0.1795	0.001549	0.0210841	Down-regulated
NM_001321704	RPS9	6203	1453.36	1299.53	1184.05	1174.91	-0.1771	0.003281	0.0357072	Down-regulated
NM_005347	HSPA5	3309	275.199	286.936	243.995	247.912	-0.1749	0.000593	0.0104945	Down-regulated
NM_184041	ALDOA	226	751.385	701.863	622.548	644.918	-0.1728	0.000713	0.0119938	Down-regulated
NM_001235	SERPINH1	871	248.68	239.517	214.402	212.777	-0.1721	0.000203	0.0045553	Down-regulated
NM_021009	UBC	7316	401.52	393.1	336.256	362.613	-0.1648	0.003138	0.0343844	Down-regulated
NM_031286	SH3BGRL3	83442	302.096	298.426	259.67	265.633	-0.1631	0.003558	0.0377539	Down-regulated
NM_001102	ACTN1	87	172.279	178.984	151.669	158.38	-0.1618	0.004133	0.0421004	Down-regulated
NM_001748	CAPN2	824	197.924	196.12	175.489	173.362	-0.1582	0.000231	0.005021	Down-regulated
NM_005720	ARPC1B	10095	456.996	457.475	396.6	411.216	-0.1549	0.001566	0.021284	Down-regulated
NM_053275	RPLP0	6175	1346.03	1350.72	1169.58	1224.94	-0.145	0.002393	0.0287861	Down-regulated
NM_004048	B2M	567	2365.91	2290.95	2525.36	2443.62	0.12212	0.002449	0.0292338	Up-regulated
NM_002999	SDC4	6385	256.018	253.088	274.113	277.87	0.1325	0.001699	0.0226375	Up-regulated
NM_002137	HNRNPA2B1	3181	209.191	207.732	224.26	229.76	0.13702	0.001261	0.0182343	Up-regulated
NM_000918	P4HB	5034	315.494	306.03	335.288	351.64	0.15957	0.000966	0.0150409	Up-regulated
NM_002136	HNRNPA1	3178	772.057	785.383	847.144	873.609	0.1619	0.000423	0.0079692	Up-regulated
NM_015238	WWC1	23286	44.1697	43.1747	48.557	48.5253	0.16362	0.001265	0.0182458	Up-regulated
NM_005231	CTTN	2017	129.17	126.435	139.939	143.68	0.16394	0.000676	0.01156	Up-regulated
NM_007173	PRSS23	11098	325.504	331.264	361.481	368.44	0.16559	0.000115	0.0029317	Up-regulated
NM_014502	PRPF19	27339	98.7334	94.7565	106.831	108.736	0.17027	0.003511	0.0375359	Up-regulated
NM_006622	PLK2	10769	205.345	207.662	229.939	231.226	0.17357	0.000143	0.0034596	Up-regulated
NM_018218	USP40	55230	26.7909	26.6092	30.1601	29.8498	0.17812	0.005244	0.049983	Up-regulated
NM_006088	TUBB4B	10383	153.433	143.763	164.597	167.552	0.17819	0.004101	0.0419101	Up-regulated
NM_006937	SUMO2	6613	230.91	221.796	248.755	255.561	0.17968	0.00313	0.0343728	Up-regulated
NM_004404	2-Sep	4735	187	189.141	214.637	210.125	0.18879	5.59E-05	0.0016561	Up-regulated
NM_018947	CYCS	54205	47.556	48.6059	54.0842	54.7398	0.18892	0.000779	0.0128178	Up-regulated

NM_021130	PPIA	5478	667.868	719.254	778.556	788.469	0.18931	0.001753	0.0231455	Up-regulated
NM_001207	BTF3	689	599.341	637.033	692.903	705.305	0.20104	0.001538	0.0210189	Up-regulated
NM_006169	NNMT	4837	253.689	250.524	276.685	296.67	0.20257	0.000872	0.0139996	Up-regulated
NM_015161	ARL6IP1	23204	94.4268	95.4252	109.723	106.892	0.20344	0.000671	0.0115281	Up-regulated
NM_004964	HDAC1	3065	58.7518	61.1922	69.0885	68.5972	0.21011	0.005217	0.0497721	Up-regulated
NM_201442	C1S	716	96.4691	101.926	114.927	113.151	0.21234	0.001064	0.0160887	Up-regulated
NM_178014	TUBB	203068	397.178	357.836	429.687	438.089	0.21385	0.000378	0.0073518	Up-regulated
NM_003400	XPO1	7514	41.1272	42.9224	49.076	47.8298	0.21389	0.001249	0.0181361	Up-regulated
NM_006601	PTGES3	10728	129.186	141.224	156.537	155.489	0.21725	0.00395	0.040803	Up-regulated
NM_032737	LMNB2	84823	69.5504	62.9529	73.5734	79.7722	0.21819	0.003861	0.0399605	Up-regulated
NM_004501	HNRNPU	3192	37.1324	39.9639	43.0232	46.3591	0.21858	0.00448	0.0446011	Up-regulated
NM_004670	PAPSS2	9060	91.6561	99.1997	112.298	108.686	0.21973	0.001719	0.022774	Up-regulated
NM_006342	TACC3	10460	32.2189	32.8661	37.7079	37.7766	0.22242	0.00436	0.0439254	Up-regulated
NM_005381	NCL	4691	228.837	253.335	277.655	281.731	0.22345	0.001969	0.0249347	Up-regulated
NM_001101	ACTB	60	1769.46	1915.24	2078.35	2185.46	0.2242	0.000624	0.0109052	Up-regulated
NM_001539	DNAJA1	3301	50.775	53.5034	61.0111	60.0765	0.22455	0.003759	0.0392934	Up-regulated
NM_001024465	SOD2	6648	344.741	315.292	396.785	364.739	0.22681	0.002045	0.025667	Up-regulated
NM_002271	IPO5	3843	48.1529	51.2984	57.7114	58.0436	0.2269	0.000465	0.0085654	Up-regulated
NM_018269	ADI1	55256	65.9957	65.9648	74.9234	78.3202	0.22784	0.003058	0.0337563	Up-regulated
NM_001733	C1R	715	156.105	147.215	170.968	181.063	0.22821	0.000198	0.0045056	Up-regulated
NM_001291964	AFDN	4301	42.4942	42.7454	49.1887	50.0126	0.22875	5.71E-06	0.0002667	Up-regulated
NM_004339	PTTG1IP	754	190.278	204.056	226.054	232.781	0.22924	0.000334	0.006735	Up-regulated
NM_001357	DHX9	1660	28.4821	29.664	33.6343	34.2865	0.23121	0.001408	0.0196891	Up-regulated
NM_001416	EIF4A1	1973	387.127	411.709	458.137	470.422	0.23121	0.000128	0.0031799	Up-regulated
NM_016284	CNOT1	23019	11.5619	12.2423	14.162	13.7497	0.23294	0.004311	0.0435553	Up-regulated
NM_003064	SLPI	6590	2799.53	2714.68	3092.81	3179.1	0.23372	9.72E-08	8.82E-06	Up-regulated
NM_006464	TGOLN2	10618	26.8288	29.6941	33.2652	33.0717	0.23437	0.004243	0.0430237	Up-regulated
NM_002893	RBBP7	5931	57.9174	61.1192	69.117	70.0446	0.235	0.002847	0.0323669	Up-regulated
NM_014142	NUDT5	11164	22.2737	22.919	26.117	26.8748	0.23515	0.004975	0.0481706	Up-regulated
NM_031157	HNRNPA1	3178	73.6539	73.1757	82.9965	88.568	0.23642	0.001401	0.0196277	Up-regulated
NM_001282667	MICAL2	9645	30.2634	30.2803	34.6925	36.3809	0.2394	0.000119	0.003003	Up-regulated
NM_018976	SLC38A2	54407	79.5926	85.8828	96.4616	97.8931	0.23968	0.000299	0.0061092	Up-regulated
NM_002802	PSMC1	5700	73.7584	76.356	87.0583	88.9841	0.24267	0.00163	0.021956	Up-regulated
NM_004515	ILF2	3608	79.5745	84.9582	98.3578	95.086	0.24314	0.001967	0.0249347	Up-regulated
NM_021103	TMSB10	9168	4147.59	3962.09	4586.06	4575.44	0.24428	3.51E-10	5.84E-08	Up-regulated
NM_018370	DRAM1	55332	45.4163	44.4243	54.1507	51.5998	0.24444	0.000296	0.0060801	Up-regulated
NM_003076	SMARCD1	6602	25.9128	24.9001	29.1889	30.7604	0.24455	0.002659	0.0309317	Up-regulated
NM_016025	METTL9	51108	21.1995	19.8883	24.005	24.5545	0.24563	0.005009	0.0483807	Up-regulated
NM_006888	CALM1	801	32.103	33.659	38.1764	39.6174	0.24845	0.000795	0.0130217	Up-regulated
NM_001124	ADM	133	145.715	139.531	160.171	176.123	0.25042	0.000878	0.0140779	Up-regulated
NM_002129	HMGB2	3148	85.7614	82.4405	95.9032	102.572	0.25126	0.001239	0.0180235	Up-regulated
NM_002748	MAPK6	5597	24.8332	26.3769	30.5658	30.2595	0.25239	0.001652	0.0222036	Up-regulated
NM_016038	SBDS	51119	56.6029	58.2016	67.3448	68.6843	0.25502	0.0018	0.0236442	Up-regulated
NM_002804	PSMC3	5702	107.967	104.607	125.124	126.041	0.25609	5.48E-05	0.001636	Up-regulated
NM_001195532	SPTAN1	6709	14.0521	15.2168	17.4199	17.5196	0.25717	0.001822	0.0237913	Up-regulated
NM_005594	NACA	4666	153.843	165.195	188.097	189.599	0.26018	0.001074	0.0162028	Up-regulated
NM_181575	AUP1	550	61.563	62.1461	72.87	74.1551	0.26036	0.000682	0.0116401	Up-regulated
NM_203499	DDX42	11325	25.4878	27.5305	30.4478	33.2442	0.26435	0.004559	0.0451389	Up-regulated
NM_003754	EIF3F	8665	145.138	150.909	172.078	179.724	0.26472	0.000277	0.0058029	Up-regulated
NM_012073	CCT5	22948	61.289	63.5127	75.2165	73.9506	0.26637	1.80E-05	0.000681	Up-regulated
NM_007100	ATP5I	521	668.792	588.858	701.522	692.767	0.2677	0.001878	0.0242038	Up-regulated
NM_001293	CLNS1A	1207	84.3661	83.1435	99.8122	99.9425	0.26846	0.00023	0.0050143	Up-regulated
NM_003079	SMARCE1	6605	40.3955	41.4435	47.9943	50.2883	0.27104	0.000726	0.0121473	Up-regulated
NM_020150	SAR1A	56681	59.1598	61.5421	71.3069	73.7326	0.27332	6.11E-05	0.0017652	Up-regulated
NM_001127228	CBX1	10951	50.4419	54.6274	62.6259	63.8947	0.27342	0.001262	0.0182343	Up-regulated
NM_016079	CHMP3	51652	28.0929	28.23	33.8048	33.9825	0.27363	0.000354	0.0069888	Up-regulated
NM_004526	MCM2	4171	20.9479	21.0211	24.5643	26.074	0.27366	0.001539	0.0210189	Up-regulated

NM_001135146	SLC39A8	64116	39.3456	39.8361	46.4905	48.7797	0.27382	0.000174	0.0040515	Up-regulated
NM_005733	KIF20A	10112	22.2917	21.8038	25.7558	27.4279	0.27387	0.00133	0.01894	Up-regulated
NM_006908	RAC1	5879	180.387	204.663	227.594	236.44	0.27439	0.000987	0.0152717	Up-regulated
NM_145725	TRAF3	7187	11.4197	10.6064	13.8984	12.7594	0.27443	0.002577	0.0303289	Up-regulated
NM_001710	CFB	629	149.681	159.685	185.161	186.471	0.27463	1.42E-05	0.0005679	Up-regulated
NM_024117	MAPKAP1	79109	18.1995	16.7872	21.8745	20.474	0.27477	0.005161	0.0493267	Up-regulated
NM_018284	GBP3	2635	22.2604	22.1294	28.3518	25.4763	0.27706	0.004827	0.0469067	Up-regulated
NM_002156	HSPD1	3329	242.265	260.41	296.952	308.376	0.27829	2.18E-05	0.0008101	Up-regulated
NM_001032283	TMPO	7112	12.7634	12.5875	15.4439	15.3656	0.28106	0.001928	0.0245867	Up-regulated
NM_001412	EIF1AX	1964	21.343	23.7268	27.3137	27.5008	0.28134	0.002278	0.0278133	Up-regulated
NM_001330218	CCNYL1	151195	27.4805	29.4255	34.5075	34.495	0.28166	0.000514	0.0093203	Up-regulated
NM_021239	RBM25	58517	17.8566	16.7278	20.2591	21.7929	0.28234	0.00171	0.0226815	Up-regulated
NM_032940	POLR2C	5432	27.1568	27.1197	33.4891	32.4565	0.28356	0.003709	0.0389338	Up-regulated
NM_015913	TXNDC12	51060	25.7648	28.1791	33.1128	32.6204	0.28415	0.004017	0.0411885	Up-regulated
NM_001134373	NT5C2	22978	39.0776	38.9465	48.3187	46.2328	0.28445	5.23E-05	0.0015894	Up-regulated
NM_024576	OGFRL1	79627	6.33939	6.73681	7.87514	8.10083	0.28558	0.002333	0.0282152	Up-regulated
NM_015332	NUDCD3	23386	17.523	17.7939	21.667	21.3444	0.28766	0.000217	0.0047831	Up-regulated
NM_002265	KPNB1	3837	71.8347	80.7283	92.3939	93.582	0.28825	0.00034	0.0067872	Up-regulated
NM_003472	DEK	7913	63.2066	68.4631	81.443	78.8473	0.2892	0.000194	0.0044528	Up-regulated
NM_001101662	NRDC	4898	39.8119	46.4987	52.6116	53.1535	0.28937	0.003372	0.0364094	Up-regulated
NM_015294	TRIM37	4591	11.7967	12.2635	14.61	14.9321	0.29443	0.001575	0.0213746	Up-regulated
NM_001042424	WHSC1	7468	12.7787	13.3236	15.8926	16.0792	0.29525	0.000131	0.0032168	Up-regulated
NM_020401	NUP107	57122	10.1482	10.2791	12.9738	12.1388	0.29696	0.001122	0.0166712	Up-regulated
NM_016395	HACD3	51495	33.0299	37.9336	44.8003	42.6846	0.29698	0.003429	0.0368083	Up-regulated
NM_005316	GTF2H1	2965	19.6437	22.0896	26.1268	25.3394	0.2973	0.003955	0.0408155	Up-regulated
NM_001431	EPB41L2	2037	14.0542	15.4993	18.656	17.8222	0.2979	0.003065	0.0337935	Up-regulated
NM_017828	COMMD4	54939	70.2385	68.0438	80.6744	88.136	0.29892	0.002819	0.0321106	Up-regulated
NM_001311	CRIP1	1396	612.598	594.76	715.771	706.847	0.30033	4.36E-06	0.0002195	Up-regulated
NM_002843	PTPRJ	5795	19.8632	22.0248	26.1712	25.4663	0.30148	0.000338	0.0067686	Up-regulated
NM_030798	RCC1L	81554	22.4888	21.7916	26.9771	27.568	0.3016	0.001099	0.0164879	Up-regulated
NM_005610	RBBP4	5928	6.58746	7.1759	8.46824	8.57256	0.30214	0.002275	0.0278133	Up-regulated
NM_001199802	RPL11	6135	775.324	790.007	968.08	911.184	0.30244	2.01E-06	0.0001124	Up-regulated
NM_003751	EIF3B	8662	47.6046	41.4637	55.7875	53.9732	0.30321	0.000636	0.0110755	Up-regulated
NM_004905	PRDX6	9588	127.43	143.929	164.442	169.373	0.30386	0.000582	0.0103553	Up-regulated
NM_015213	DENND5A	23258	16.1437	16.7963	20.7015	19.9752	0.30478	0.000275	0.0057763	Up-regulated
NM_013390	TMEM2	23670	11.7358	13.5327	15.2054	16.245	0.30509	0.004556	0.0451389	Up-regulated
NM_005983	SKP2	6502	43.7688	52.1816	60.8362	58.3851	0.30558	0.003832	0.0397776	Up-regulated
NM_003798	CTNNAL1	8727	90.3429	98.8612	114.911	118.143	0.3062	6.90E-05	0.0019442	Up-regulated
NM_001032	RPS29	6235	4590.3	4604.14	5162.77	5099.14	0.30913	9.49E-06	0.0004041	Up-regulated
NM_020362	PITHD1	57095	27.5984	25.912	33.1418	33.1638	0.30961	0.002566	0.0303289	Up-regulated
NM_002645	PIK3C2A	5286	7.89794	7.75627	9.84444	9.57292	0.3104	0.000215	0.0047621	Up-regulated
NM_014865	NCAPD2	9918	25.0845	28.406	32.4937	34.0693	0.31114	0.001028	0.0156295	Up-regulated
NM_001254738	RND3	390	19.283	21.3988	26.4251	24.3649	0.31132	0.004487	0.0446011	Up-regulated
NM_003642	HAT1	8520	30.7005	32.6466	39.5124	39.2664	0.31385	0.001748	0.0231204	Up-regulated
NM_006052	DSCR3	10311	14.5501	14.5664	18.4117	17.8468	0.31393	0.001092	0.0164252	Up-regulated
NM_015068	PEG10	23089	5.69538	5.86431	7.4775	7.03026	0.3165	0.002917	0.0327747	Up-regulated
NM_001379	DNMT1	1786	9.96464	10.2593	13.0667	12.2508	0.31913	0.000899	0.0142913	Up-regulated
NM_005471	GNPDA1	10007	61.6734	63.9498	79.3537	76.6145	0.31983	1.06E-05	0.0004429	Up-regulated
NM_006197	PCM1	5108	4.98557	4.4703	5.9338	5.95904	0.32005	0.002327	0.0281751	Up-regulated
NM_004090	DUSP3	1845	27.2255	27.7227	34.9107	33.5577	0.32134	1.52E-05	0.0005988	Up-regulated
NM_007145	ZNF146	7705	10.3567	10.4815	13.0811	13.0731	0.32138	0.001387	0.0194808	Up-regulated
NM_001135699	YWHAZ	7534	14.1956	15.513	19.032	18.3341	0.32201	0.002922	0.0327747	Up-regulated
NM_031966	CCNB1	891	51.2904	52.1952	63.7191	65.0434	0.32251	1.19E-05	0.0004897	Up-regulated
NM_001172624	NEO1	4756	16.5252	19.7469	23.6013	22.2529	0.32447	0.003136	0.0343844	Up-regulated
NM_002572	PAFAH1B2	5049	18.5591	19.6866	23.9452	24.0531	0.32745	0.000128	0.0031799	Up-regulated
NM_018154	ASF1B	55723	20.394	20.0673	25.7181	25.2266	0.32747	0.002702	0.0311758	Up-regulated
NM_004805	POLR2D	5433	12.9201	12.7979	16.3254	16.2056	0.32768	0.003989	0.0411335	Up-regulated

NM_004550	NDUFS2	4720	32.6387	33.671	41.4916	41.6118	0.32844	0.000179	0.0041569	Up-regulated
NM_016097	IER3IP1	51124	28.0071	24.1784	32.9146	33.0019	0.32916	0.00498	0.0481834	Up-regulated
NM_001032293	ZNF207	7756	36.2687	37.1059	46.2646	45.6302	0.32923	5.48E-05	0.001636	Up-regulated
NM_002717	PPP2R2A	5520	13.9462	14.5578	18.625	17.3407	0.32935	0.000806	0.0131322	Up-regulated
NM_007287	MME	4311	8.80875	8.71355	11.9358	10.3048	0.33027	0.003525	0.0375401	Up-regulated
NM_001156	ANXA7	310	39.1161	43.0339	49.6932	53.9193	0.33121	0.000643	0.0111656	Up-regulated
NM_006469	IVNS1ABP	10625	11.5559	12.5365	14.6219	15.9379	0.33162	0.002062	0.0258139	Up-regulated
NM_003902	FUBP1	8880	18.7251	21.1164	25.1134	25.4123	0.33187	0.002703	0.0311758	Up-regulated
NM_000019	ACAT1	38	24.6822	27.3678	33.6584	32.1701	0.33207	0.001898	0.0243823	Up-regulated
NM_001128148	TFRC	7037	54.2646	60.7746	74.0814	70.7882	0.33231	5.77E-05	0.0017039	Up-regulated
NM_015110	SMC5	23137	5.66895	6.24648	7.45435	7.73095	0.33302	0.003538	0.0376424	Up-regulated
NM_032704	TUBA1C	84790	333.201	346.739	423.877	424.834	0.3348	6.48E-10	1.05E-07	Up-regulated
NM_030796	VOPP1	81552	25.5826	26.843	32.5207	33.6017	0.33518	0.000104	0.002723	Up-regulated
NM_004689	MTA1	9112	25.3622	30.7018	35.3659	36.2191	0.33533	0.004646	0.0458352	Up-regulated
NM_005158	ABL2	27	9.52726	10.5148	11.9561	13.5225	0.33636	0.000813	0.0132038	Up-regulated
NM_024423	DSC3	1825	5.62092	6.61135	7.91273	7.76052	0.33664	0.004697	0.0461632	Up-regulated
NM_001193417	DDX3X	1654	16.2002	17.5936	22.6589	20.3351	0.33757	0.001095	0.0164555	Up-regulated
NM_015033	FNBP1	23048	6.66978	7.19364	8.74178	8.93609	0.33771	0.001825	0.0237978	Up-regulated
NM_002913	RFC1	5981	6.9571	6.06773	8.29771	8.35815	0.3379	0.004367	0.0439511	Up-regulated
NM_004111	FEN1	2237	15.9773	16.1044	20.3949	20.3703	0.33856	0.001329	0.01894	Up-regulated
NM_001002800	SMC4	10051	15.2677	17.5681	22.1092	19.8667	0.33867	0.002434	0.0291132	Up-regulated
NM_003090	SNRPA1	6627	73.7994	73.0112	90.9409	93.2539	0.33904	6.74E-05	0.0019117	Up-regulated
NR_138470	HNRNPA3	220988	16.8881	17.8928	22.4003	21.6958	0.34183	2.88E-05	0.0010297	Up-regulated
NM_015190	DNAJC9	23234	18.6813	19.6605	23.7386	25.0952	0.34219	0.001004	0.015413	Up-regulated
NM_024830	LPCAT1	79888	9.14472	9.05625	11.2408	12.0043	0.34227	0.00143	0.0199192	Up-regulated
NM_003406	YWHAZ	7534	32.7141	38.4138	44.2457	46.6311	0.34247	0.001504	0.0206685	Up-regulated
NM_004705	THAP12	5612	10.1161	9.74188	13.2351	12.2026	0.34317	0.002549	0.0301679	Up-regulated
NM_014683	ULK2	9706	2.95018	2.95483	3.77226	3.81474	0.34413	0.002578	0.0303289	Up-regulated
NM_002940	ABCE1	6059	20.5265	25.0047	28.8074	29.7733	0.34517	0.00319	0.0348562	Up-regulated
NM_182760	SUMF1	285362	12.1868	12.1249	15.2333	16.0096	0.34533	0.004445	0.04445	Up-regulated
NM_006758	U2AF1	7307	79.8551	79.2238	98.3432	102.071	0.34565	0.000105	0.002723	Up-regulated
NM_206963	RARRES1	5918	147.309	161.813	189.416	201.811	0.34579	3.73E-05	0.0012264	Up-regulated
NM_004986	KTN1	3895	16.4297	17.3814	22.228	20.8706	0.34621	0.000141	0.0034194	Up-regulated
NM_001798	CDK2	1017	24.0485	26.4472	34.6927	30.2448	0.3476	0.003034	0.0336559	Up-regulated
NM_002979	SCP2	6342	12.0864	12.8431	15.6399	16.3974	0.34761	0.002162	0.0267059	Up-regulated
NM_033296	MRFAP1	93621	90.6579	91.7509	112.889	117.89	0.34918	4.71E-08	4.58E-06	Up-regulated
NM_005916	MCM7	4176	42.5946	38.4707	48.8083	54.6792	0.34927	0.000208	0.0046532	Up-regulated
NM_001136139	TCF3	6929	9.57765	8.72467	11.1334	12.5291	0.35173	0.002807	0.0320368	Up-regulated
NM_001309840	GNAS	2778	111.268	91.6144	131.229	127.932	0.35221	0.000473	0.0086918	Up-regulated
NM_201414	APP	351	15.1429	15.0073	19.5583	19.0741	0.35429	0.000121	0.00303	Up-regulated
NM_002823	PTMA	5757	497.537	524.638	622.092	672.039	0.35493	3.28E-07	2.48E-05	Up-regulated
NM_006401	ANP32B	10541	91.867	104.779	118.312	134.577	0.35562	0.000955	0.0149462	Up-regulated
NM_030940	ISCA1	81689	22.8027	25.8964	31.513	31.3706	0.35638	0.001642	0.0220985	Up-regulated
NM_002128	HMGB1	3146	41.9607	42.2172	52.9797	54.3653	0.35765	4.27E-09	5.33E-07	Up-regulated
NM_006708	GLO1	2739	18.7763	21.743	25.5394	27.2224	0.35931	0.003677	0.0387152	Up-regulated
NM_004703	RABEP1	9135	7.72942	8.40002	11.1995	9.81635	0.36074	0.002065	0.0258211	Up-regulated
NM_016433	GLTP	51228	21.7456	23.5505	28.5568	29.9201	0.36091	0.00044	0.0081807	Up-regulated
NM_001313998	BECN1	8678	10.6741	11.0472	14.0237	14.3484	0.36196	0.004456	0.0445256	Up-regulated
NM_003815	ADAM15	8751	51.7793	43.6075	56.2089	68.0436	0.36207	0.00271	0.0312282	Up-regulated
NM_000140	FECH	2235	4.18023	4.0701	5.44802	5.2825	0.36218	0.001045	0.015852	Up-regulated
NM_003875	GMPS	8833	25.4515	28.3105	35.0952	34.4076	0.36297	0.000342	0.0068006	Up-regulated
NM_144600	FOPNL	123811	12.2356	11.7503	15.9614	15.3028	0.36517	0.002002	0.0253325	Up-regulated
NM_006609	MAP3K2	10746	4.24826	4.47494	5.75169	5.5659	0.36529	0.000187	0.0043063	Up-regulated
NM_003435	ZNF134	7693	5.92075	6.06798	7.89906	7.74062	0.36723	0.001073	0.0162028	Up-regulated
NM_001042517	DIAPH3	81624	11.2023	11.4287	14.3607	14.9565	0.36755	6.07E-05	0.0017633	Up-regulated
NM_006845	KIF2C	11004	12.6541	13.4557	18.7295	15.6597	0.36913	0.004646	0.0458352	Up-regulated
NM_001017371	SP3	6670	6.2889	6.79195	8.93395	8.17714	0.36933	0.001135	0.0168242	Up-regulated
NM_001921	DCTD	1635	14.9085	17.0616	20.1231	21.9707	0.36985	0.004594	0.0454471	Up-regulated

NM_004856	KIF23	9493	15.9473	17.0222	22.8677	20.1836	0.37022	0.000815	0.0132119	Up-regulated
NM_004889	ATP5J2	9551	243.429	241.965	291.925	318.701	0.37118	0.000143	0.0034596	Up-regulated
NM_014463	LSM3	27258	110.947	117.312	143.194	148.687	0.37132	0.000199	0.0045172	Up-regulated
NM_001127371	CDCA7L	55536	8.8731	8.15995	10.9371	11.476	0.37183	0.003407	0.0366114	Up-regulated
NM_001202543	CUX1	1523	5.54115	6.78875	7.81339	8.50878	0.3768	0.002043	0.025667	Up-regulated
NM_018434	RNF130	55819	14.4833	17.0361	20.9117	20.8045	0.37735	0.003083	0.0339255	Up-regulated
NM_000598	IGFBP3	3486	120.104	123.162	152.533	162.063	0.37894	1.37E-09	1.93E-07	Up-regulated
NM_004436	ENSA	2029	52.5246	43.8955	63.1592	62.9007	0.38071	0.000749	0.012484	Up-regulated
NM_022132	MCCC2	64087	17.4176	19.3413	23.1822	25.1028	0.38141	0.000255	0.0054437	Up-regulated
NM_002582	PARN	5073	11.449	12.5044	16.4668	15.2666	0.38621	0.000896	0.0142867	Up-regulated
NM_001128930	ENTPD4	9583	5.0029	5.86732	7.54136	7.01071	0.38669	0.003045	0.0337119	Up-regulated
NM_002106	H2AFZ	3015	199.576	215.886	260.868	277.837	0.38691	6.05E-06	0.0002788	Up-regulated
NM_003390	WEE1	7465	6.29195	7.07552	8.57302	9.39333	0.38757	0.004967	0.0481414	Up-regulated
NM_001099285	PTMA	5757	48.806	57.6805	65.9018	75.8091	0.38853	0.002906	0.0326965	Up-regulated
NM_001144772	NSMAF	8439	5.28565	5.25929	7.0657	7.08647	0.38901	0.003693	0.0388075	Up-regulated
NM_002266	KPNA2	3838	69.1812	75.1933	97.4147	91.6065	0.38942	5.01E-06	0.0002422	Up-regulated
NM_006461	SPAG5	10615	10.2893	10.6438	13.4345	14.2416	0.38971	0.00019	0.0043734	Up-regulated
NM_001112736	FAM208A	23272	6.34741	7.82188	9.49079	9.48092	0.38982	0.001833	0.02381	Up-regulated
NM_032223	PCNX3	399909	9.12915	7.23245	10.6449	11.2329	0.38996	0.002005	0.0253408	Up-regulated
NM_005342	HMGB3	3149	8.022	8.96935	12.1498	10.6742	0.39056	0.003162	0.0345849	Up-regulated
NM_080593	HIST1H2BK	85236	64.1858	61.4228	81.3248	82.4174	0.39079	0.000105	0.002723	Up-regulated
NM_002192	INHBA	3624	4.66009	4.27353	6.04803	5.86891	0.39122	0.000887	0.0141833	Up-regulated
NM_002916	RFC4	5984	15.0226	15.2613	19.9303	20.6377	0.39148	0.003804	0.0396282	Up-regulated
NM_007111	TFDP1	7027	35.159	38.0182	48.0988	48.0552	0.39235	5.00E-06	0.0002422	Up-regulated
NM_005517	HMGN2	3151	166.121	177.103	222.128	225.908	0.39308	1.79E-09	2.39E-07	Up-regulated
NM_001308176	CDH2	1000	0.002195	0.049674	7.58609	17.9732	0.39311	0.003762	0.0392934	Up-regulated
NM_007192	SUPT16H	11198	29.6966	32.8967	41.5511	40.8597	0.39325	3.40E-06	0.0001787	Up-regulated
NM_001039348	EFEMP1	2202	21.4028	21.1722	27.4045	28.6277	0.39461	4.16E-06	0.0002115	Up-regulated
NM_001164803	RBMX	27316	10.5099	10.6416	13.973	14.444	0.39579	0.002278	0.0278133	Up-regulated
NM_182746	MCM4	4173	14.778	15.1353	19.6596	19.8085	0.39806	1.23E-06	7.57E-05	Up-regulated
NM_004157	PRKAR2A	5576	4.48457	5.17473	6.30933	6.71914	0.39866	0.00167	0.022362	Up-regulated
NM_015261	NCAPD3	23310	5.84783	6.43995	8.08846	8.39382	0.40203	0.000437	0.0081392	Up-regulated
NM_001136108	R3HCC1	203069	19.7785	16.9305	23.9495	25.4572	0.40213	0.001965	0.0249347	Up-regulated
NM_015577	RAI14	26064	26.1407	33.4518	40.7766	39.7383	0.40367	0.00108	0.0162735	Up-regulated
NM_001256550	MPP5	64398	5.70021	4.5068	6.94953	7.01818	0.40751	0.003572	0.0378619	Up-regulated
NR_002315	H3F3AP4	440926	67.4646	73.1869	94.4803	91.9175	0.40875	3.47E-05	0.0011682	Up-regulated
NM_057161	KLHDC3	116138	26.4155	24.4343	33.1881	34.6649	0.40934	2.92E-05	0.00104	Up-regulated
NM_004733	SLC33A1	9197	5.5852	5.71227	7.1378	8.37081	0.41045	0.0034	0.0365655	Up-regulated
NM_145185	MAP2K7	5609	7.62101	6.91728	9.2824	10.5537	0.41127	0.00184	0.0238361	Up-regulated
NM_030821	PLA2G12A	81579	6.18141	6.7765	9.20744	8.3917	0.41287	0.000592	0.0104945	Up-regulated
NM_001018006	TPM1	7168	285.941	306.832	391.813	392.622	0.41377	7.52E-11	1.56E-08	Up-regulated
NM_005246	FER	2241	2.11568	2.09672	2.89216	2.81981	0.414	0.000338	0.0067684	Up-regulated
NM_001172681	ZNF641	121274	5.00511	5.63908	6.94619	7.67934	0.41531	0.002365	0.0285071	Up-regulated
NM_005548	KARS	3735	48.4706	51.4765	63.0086	70.9896	0.4154	2.38E-05	0.0008768	Up-regulated
NM_001440	EXTL3	2137	6.13406	7.21825	8.69938	9.5826	0.4187	0.000894	0.0142734	Up-regulated
NM_004500	HNRNPC	3183	74.1633	66.8826	102.507	87.381	0.41924	2.14E-05	0.0007996	Up-regulated
NM_001206999	CIT	11113	2.66485	3.09759	3.85012	4.08219	0.41964	0.001707	0.0226811	Up-regulated
NM_001363	DKC1	1736	36.593	37.8889	47.8799	51.9358	0.41985	1.22E-06	7.57E-05	Up-regulated
NM_001033	RRM1	6240	29.7577	33.1688	41.5879	43.1223	0.42066	6.25E-06	0.0002859	Up-regulated
NM_001127671	LIFR	3977	7.06755	8.39897	10.3647	10.7078	0.42249	0.000157	0.0037158	Up-regulated
NM_000636	SOD2	6648	407.187	445.862	581.579	560.079	0.42326	2.85E-10	4.82E-08	Up-regulated
NM_001286665	POSTN	10631	24.7528	31.453	41.6895	36.0508	0.42369	0.001922	0.0245376	Up-regulated
NR_104285	CAST	831	10.7668	11.3592	15.0735	15.4448	0.42528	0.001843	0.0238361	Up-regulated
NM_175610	TJP1	7082	4.48291	4.20226	6.49282	5.47883	0.42608	0.000848	0.013646	Up-regulated
NM_001031835	PHKB	5257	6.80841	7.87961	10.2755	9.85904	0.42634	0.000342	0.0068006	Up-regulated
NM_018137	PRMT6	55170	7.11385	7.22321	9.75722	10.0829	0.42948	0.001362	0.0192513	Up-regulated
NM_022346	NCAPG	64151	4.77766	5.96879	7.67096	7.39754	0.43037	0.003083	0.0339255	Up-regulated
NM_014220	TM4SF1	4071	149.469	152.926	202.004	202.438	0.43132	9.85E-14	3.00E-11	Up-regulated

NM_000194	HPRT1	3251	15.9742	18.2384	23.31	24.0917	0.43167	0.001754	0.0231455	Up-regulated
NM_003905	NAE1	8883	28.3578	31.1757	42.0852	39.0519	0.43222	7.08E-05	0.0019729	Up-regulated
NM_001980	STX2	2054	6.19558	5.06461	8.07165	7.74412	0.43294	0.003494	0.0374301	Up-regulated
NM_006082	TUBA1B	10376	562.011	572.581	751.942	764.162	0.43324	6.13E-22	3.96E-19	Up-regulated
NM_001164758	PRKAR1B	5575	16.5578	15.0564	22.228	21.0098	0.43461	6.28E-05	0.001806	Up-regulated
NM_001497	B4GALT1	2683	22.9711	25.4201	32.5493	33.2455	0.43537	1.30E-06	7.83E-05	Up-regulated
NM_006231	POLE	5426	4.11804	3.9083	5.55678	5.4461	0.43594	4.40E-05	0.0013852	Up-regulated
NM_001278461	COBLL1	22837	7.07358	8.40358	10.4643	10.8643	0.43693	0.000116	0.0029495	Up-regulated
NM_024790	CSPP1	79848	2.71855	2.5776	3.63508	3.92448	0.4372	0.00509	0.0487722	Up-regulated
NM_001071	TYMS	7298	30.2895	33.6035	46.1245	41.6536	0.43882	0.000158	0.0037213	Up-regulated
NM_002358	MAD2L1	4085	21.1433	20.1516	28.1682	28.5857	0.44043	0.000155	0.0036835	Up-regulated
NM_152407	GRPEL2	134266	3.51027	3.87069	5.25318	5.20547	0.44187	0.002885	0.0326275	Up-regulated
NM_022071	SH2D4A	63898	6.55674	6.03841	9.47051	8.23445	0.44345	0.001426	0.0198981	Up-regulated
NM_001293179	PRSS23	11098	4.78791	4.65067	6.06498	7.3418	0.44367	0.002859	0.0324322	Up-regulated
NM_005192	CDKN3	1033	24.5081	26.2703	37.0108	34.0566	0.44505	0.001935	0.0246381	Up-regulated
NM_018087	NDC1	55706	6.66627	6.9682	9.40296	9.42564	0.44532	3.59E-05	0.0011991	Up-regulated
NM_002097	GTF3A	2971	19.7627	19.5205	26.883	27.4389	0.44538	0.000195	0.0044623	Up-regulated
NM_031372	HNRNPDL	9987	24.0891	29.3064	34.7485	39.6898	0.44558	0.000298	0.0060947	Up-regulated
NM_032303	HSDL2	84263	11.8848	12.813	16.418	17.7095	0.44573	4.70E-05	0.0014697	Up-regulated
NM_003318	TTK	7272	5.70767	4.88825	7.60702	7.47598	0.44797	0.002617	0.0306007	Up-regulated
NM_005687	FARSB	10056	12.8674	15.9744	19.8631	20.9267	0.45124	0.001116	0.0166712	Up-regulated
NM_000791	DHFR	1719	12.5816	14.4793	18.3579	19.2784	0.45152	6.10E-05	0.0017652	Up-regulated
NM_004523	KIF11	3832	6.72943	8.0585	10.4717	10.3222	0.4525	0.000372	0.0072721	Up-regulated
NM_005441	CHAF1B	8208	7.16601	7.39736	10.2981	10.4202	0.45408	0.001362	0.0192513	Up-regulated
NM_001083614	EARS2	124454	4.85302	5.06052	6.88521	7.09703	0.45419	0.000528	0.0095412	Up-regulated
NM_003404	YWHAB	7529	6.09447	5.26403	7.94659	8.18244	0.4548	0.001306	0.0187206	Up-regulated
NM_002945	RPA1	6117	19.6619	22.7146	29.4954	29.329	0.456	8.12E-06	0.0003507	Up-regulated
NM_006690	MMP24	10893	18.0989	17.1638	23.4451	25.1637	0.45694	1.18E-07	1.03E-05	Up-regulated
NM_006101	NDC80	10403	11.8666	13.0014	18.3163	16.7011	0.4577	0.000397	0.0075746	Up-regulated
NM_014997	KLHDC10	23008	4.42455	4.74402	6.62224	6.24604	0.45893	8.58E-05	0.0023139	Up-regulated
NM_001114092	THUMPD3	25917	3.29006	3.53909	5.05366	4.84543	0.45898	0.003108	0.0341581	Up-regulated
NM_002894	RBBP8	5932	5.98095	6.6098	9.09863	8.78299	0.45901	0.00065	0.0112749	Up-regulated
NM_005016	PCBP2	5094	33.0579	28.3807	45.7646	40.0506	0.46089	3.16E-05	0.0011024	Up-regulated
NM_001199341	RPL17	6139	79.8022	84.3746	111.529	113.936	0.46251	3.01E-06	0.0001606	Up-regulated
NM_001113378	FANCI	55215	8.11011	10.5062	13.4714	13.2146	0.46259	0.001036	0.0157424	Up-regulated
NM_005563	STMN1	3925	50.6288	51.4666	70.7295	69.8331	0.46364	2.03E-08	2.25E-06	Up-regulated
NM_018179	ATF7IP	55729	5.25772	4.84506	7.23624	6.86989	0.46373	3.61E-06	0.0001869	Up-regulated
NM_199413	PRC1	9055	18.3309	15.5267	23.3368	24.1007	0.46542	2.40E-05	0.0008799	Up-regulated
NM_018131	CEP55	55165	14.0629	15.4687	20.9487	20.4758	0.46635	2.65E-05	0.000964	Up-regulated
NM_001316	CSE1L	1434	26.2464	28.6571	38.4404	37.9095	0.46857	6.78E-08	6.41E-06	Up-regulated
NM_004701	CCNB2	9133	31.7719	36.8865	48.5124	48.2374	0.47204	4.78E-05	0.0014832	Up-regulated
NM_012405	ICMT	23463	14.6833	15.4474	21.021	21.0741	0.47536	1.90E-08	2.12E-06	Up-regulated
NM_006016	CD164	8763	43.6097	45.5091	62.4694	61.3095	0.47587	6.62E-12	1.58E-09	Up-regulated
NM_003368	USP1	7398	11.4213	11.879	16.0995	16.6388	0.47617	9.13E-07	5.86E-05	Up-regulated
NM_184043	ALDOA	226	31.94	37.0997	47.5287	50.3137	0.47763	5.30E-05	0.0016004	Up-regulated
NM_001256378	MCMBP	79892	4.04756	4.9049	6.62213	6.46354	0.47805	0.001317	0.0188533	Up-regulated
NM_012112	TPX2	22974	27.4806	28.8826	38.8261	39.8629	0.47815	8.83E-10	1.34E-07	Up-regulated
NM_018685	ANLN	54443	33.8087	37.4075	50.4683	49.1731	0.47824	6.20E-09	7.49E-07	Up-regulated
NM_031217	KIF18A	81930	4.125	4.8047	6.95156	6.24665	0.47982	0.00228	0.0278133	Up-regulated
NM_175748	UBR7	55148	2.91684	3.29315	4.83869	4.46961	0.4801	0.003725	0.0390691	Up-regulated
NM_007057	ZWINT	11130	16.0968	13.2071	25.0289	18.7976	0.4807	0.004012	0.0411885	Up-regulated
NM_182649	PCNA	5111	26.2532	24.6219	36.2228	35.6299	0.48232	1.68E-05	0.0006476	Up-regulated
NM_015560	OPA1	4976	3.18906	3.14719	4.32536	4.8619	0.48695	0.000271	0.0057318	Up-regulated
NM_022121	PERP	64065	20.2664	21.7414	29.4592	29.7567	0.48795	5.50E-09	6.71E-07	Up-regulated
NM_017975	ZWILCH	55055	8.24835	9.15956	12.5964	12.4774	0.49029	5.83E-05	0.0017156	Up-regulated
NM_194454	KRIT1	889	3.88646	5.28099	6.88501	6.95299	0.49052	0.002756	0.0316222	Up-regulated
NM_005915	MCM6	4175	10.289	11.5827	15.4185	15.9069	0.49068	1.25E-05	0.0005094	Up-regulated
NM_021927	GUF1	60558	3.99591	4.74414	6.12192	6.87595	0.4925	0.001174	0.0172527	Up-regulated

NM_001145966	MKI67	4288	1.65771	1.55561	2.2867	2.40757	0.49628	0.000166	0.003887	Up-regulated
NM_199161	SAA1	6288	170.343	131.276	210.648	215.385	0.49735	9.56E-05	0.0025235	Up-regulated
NM_017779	DEPDC1	55635	4.47587	5.67821	7.27088	7.84624	0.49742	0.001021	0.0155699	Up-regulated
NM_030797	FAM49A	81553	5.63812	6.02114	9.31743	7.78992	0.49792	0.000267	0.0056798	Up-regulated
NM_005154	USP8	9101	4.31226	3.8616	5.88464	6.00521	0.49802	6.98E-05	0.0019504	Up-regulated
NM_001037501	NBPF8	728841	3.2086	2.32126	4.17997	4.38939	0.49978	0.004488	0.0446011	Up-regulated
NM_014736	KIAA0101	9768	30.1113	30.3125	42.5679	43.5776	0.50153	3.88E-07	2.82E-05	Up-regulated
NM_001424	EMP2	2013	3.51306	3.87186	5.13701	5.79477	0.50188	0.000402	0.0076633	Up-regulated
NM_016312	WBP11	51729	14.6275	17.0291	22.7498	23.1721	0.50397	2.33E-05	0.00086	Up-regulated
NM_003218	TERF1	7013	5.2001	5.19946	7.83932	7.58914	0.50439	0.000458	0.0084581	Up-regulated
NM_001010851	ZNF766	90321	3.50437	4.40053	6.19173	6.07048	0.50682	0.00333	0.0360922	Up-regulated
NM_016343	CENPF	1063	3.28553	4.15593	5.49163	5.52688	0.50683	0.000215	0.0047624	Up-regulated
NM_012308	KDM2A	22992	4.52045	3.73833	6.2333	5.89606	0.50858	7.44E-05	0.0020629	Up-regulated
NM_014077	FAM32A	26017	34.0447	34.8859	52.836	46.6536	0.51003	4.01E-06	0.0002046	Up-regulated
NM_021067	GINS1	9837	6.34323	5.88823	9.2136	8.80304	0.51211	8.36E-05	0.0022713	Up-regulated
NM_014584	ERO1A	30001	9.98368	11.2285	15.4343	15.2956	0.51286	5.85E-07	3.99E-05	Up-regulated
NM_001286734	CENPE	1062	2.33825	2.32611	3.60364	3.31075	0.5166	8.50E-05	0.0022986	Up-regulated
NM_017519	ARID1B	57492	0.986295	0.998416	1.36288	1.87008	0.52119	0.005085	0.0487706	Up-regulated
NM_001079818	ITGA6	3655	2.63568	2.3347	4.06338	3.54515	0.52235	0.000787	0.0129107	Up-regulated
NM_080668	CDCA5	113130	11.0443	9.68372	15.0812	15.5682	0.52434	2.18E-05	0.0008105	Up-regulated
NM_025075	THOC7	80145	40.3547	43.4173	63.7804	58.4658	0.52443	7.02E-06	0.0003095	Up-regulated
NM_020824	ARHGAP21	57584	8.28138	9.66645	13.0976	13.2755	0.5256	1.60E-06	9.14E-05	Up-regulated
NM_004336	BUB1	699	11.9328	11.8772	16.8853	17.8163	0.5267	6.85E-08	6.43E-06	Up-regulated
NM_015185	ARHGEF9	23229	2.09841	1.8708	3.35059	2.87902	0.52694	0.001831	0.02381	Up-regulated
NM_004237	TRIP13	9319	9.04347	9.17473	13.9323	13.1535	0.52792	3.43E-05	0.0011613	Up-regulated
NM_002388	MCM3	4172	14.963	16.945	22.9739	23.8994	0.52888	1.24E-06	7.60E-05	Up-regulated
NM_001092	ABR	29	7.56371	9.21215	12.5273	12.5061	0.52988	3.07E-05	0.0010812	Up-regulated
NM_020675	SPC25	57405	8.39765	9.13933	13.2757	14.2055	0.53067	0.001531	0.0209901	Up-regulated
NM_001006622	WDR33	55339	2.48249	2.79689	4.25081	4.2145	0.53072	0.002949	0.0329441	Up-regulated
NM_021163	RBAK	57786	4.17492	4.25109	6.20202	6.22725	0.53074	1.77E-06	0.0001003	Up-regulated
NM_001973	ELK4	2005	1.95559	2.0814	3.13556	2.89742	0.53168	2.68E-05	0.0009722	Up-regulated
NM_001165412	NFKB1	4790	4.41137	7.07096	9.56629	9.21746	0.53205	0.003757	0.0392934	Up-regulated
NM_004390	CTSH	1512	26.066	26.5579	38.339	38.7523	0.53505	2.17E-07	1.74E-05	Up-regulated
NM_182811	PLCG1	5335	2.31767	2.22291	3.20405	3.96884	0.53618	0.001472	0.0203301	Up-regulated
NM_001145299	EXOC7	23265	2.05902	2.44962	3.91004	3.33057	0.53794	0.002054	0.025748	Up-regulated
NM_198847	FAM111A	63901	2.51581	2.93223	4.99301	3.973	0.53913	0.003383	0.0364205	Up-regulated
NM_001321191	RUVBL2	10856	38.0702	27.5751	49.1211	50.4832	0.53926	0.000147	0.0035063	Up-regulated
NM_001067	TOP2A	7153	41.1768	45.708	66.1097	61.1633	0.53947	2.53E-10	4.41E-08	Up-regulated
NM_198335	GANAB	23193	10.7889	12.9114	18.5492	17.0583	0.54005	1.74E-05	0.0006633	Up-regulated
NM_001297704	ADGRL2	23266	9.71259	9.84521	14.3176	14.4363	0.54517	1.37E-10	2.60E-08	Up-regulated
NM_052917	GALNT13	114805	2.23423	2.60828	3.80263	3.74926	0.54651	0.000433	0.0080949	Up-regulated
NM_001809	CENPA	1058	6.86081	8.66526	11.9144	13.6125	0.54712	0.002644	0.0308268	Up-regulated
NM_001080415	U2SURP	23350	3.23961	4.87669	6.91217	6.24223	0.55048	0.001488	0.0205036	Up-regulated
NM_001291412	SON	6651	4.56813	5.19397	8.3366	7.22242	0.55205	0.000983	0.0152259	Up-regulated
NM_001128914	PCBP2	5094	4.65688	3.6461	6.83107	6.47301	0.5521	0.00099	0.0152841	Up-regulated
NM_182620	SKA2	348235	9.82475	9.96499	14.9187	14.7847	0.55719	4.26E-07	3.01E-05	Up-regulated
NM_152624	DCP2	167227	1.44737	1.89442	2.63798	2.70133	0.55935	0.000534	0.0096233	Up-regulated
NM_001786	CDK1	983	19.9781	21.5982	31.0477	31.299	0.56007	1.80E-07	1.49E-05	Up-regulated
NM_018369	DEPDC1B	55789	4.0817	4.85556	7.83902	6.81324	0.56286	0.001212	0.0177464	Up-regulated
NM_005053	RAD23A	5886	27.4679	26.3638	37.1697	44.6033	0.56499	3.26E-06	0.0001732	Up-regulated
NM_006406	PRDX4	10549	35.6042	37.0908	52.0857	57.8543	0.56515	6.54E-06	0.0002954	Up-regulated
NM_152455	ZSCAN29	146050	1.51905	1.50525	2.75812	2.28438	0.56705	0.001612	0.0217677	Up-regulated
NM_005496	SMC4	10051	3.023	3.09445	4.58826	4.93045	0.56845	4.20E-05	0.0013395	Up-regulated
NM_153695	ZNF367	195828	6.30511	5.92705	8.84568	10.0078	0.56865	1.37E-05	0.0005512	Up-regulated
NM_001260489	LSR	51599	5.0508	3.81828	7.42795	7.38934	0.57041	0.001594	0.0215883	Up-regulated
NM_014109	ATAD2	29028	6.33064	7.4632	10.5315	10.6286	0.57105	2.64E-06	0.0001436	Up-regulated
NM_016195	KIF20B	9585	3.39183	3.253	4.98606	5.23006	0.57167	3.65E-06	0.0001881	Up-regulated

NM_001254	CDC6	990	9.2826	9.11711	15.1649	13.1468	0.57224	6.07E-06	0.0002788	Up-regulated
NM_001083314	CHMP1A	5119	3.759	3.32725	7.03821	5.30202	0.57243	0.002676	0.0310646	Up-regulated
NM_005397	PODXL	5420	17.6568	16.9897	24.5734	27.5853	0.57547	8.53E-11	1.73E-08	Up-regulated
NM_001098525	CKAP2	26586	4.81088	5.34273	6.9712	9.8602	0.57659	0.000899	0.0142913	Up-regulated
NM_024745	SHCBP1	79801	6.43639	7.58883	11.2164	10.7441	0.58017	2.64E-05	0.0009625	Up-regulated
NM_006479	RAD51AP1	10635	5.35517	4.7529	8.28041	8.22939	0.58762	0.000296	0.0060801	Up-regulated
NM_007346	OGFR	11054	25.0696	19.5477	33.3896	36.2819	0.5878	7.09E-06	0.0003114	Up-regulated
NM_001048201	UHRF1	29128	8.62757	9.44194	13.7924	13.9664	0.5881	7.57E-08	7.05E-06	Up-regulated
NM_002915	RFC3	5983	3.48771	3.94644	6.6354	5.94594	0.58931	0.000964	0.0150409	Up-regulated
NM_133474	ZNF721	170960	3.0936	2.99248	4.71734	4.9542	0.58941	3.94E-05	0.001287	Up-regulated
NM_001143842	TMEM106C	79022	21.2792	19.6818	44.3939	26.4594	0.58958	0.001506	0.0206685	Up-regulated
NM_006499	LGALS8	3964	1.59563	1.16594	2.17528	2.78061	0.59262	0.002107	0.026199	Up-regulated
NM_017512	ENOSF1	55556	6.11652	6.78033	9.99799	9.96817	0.59467	9.72E-08	8.82E-06	Up-regulated
NM_002543	OLR1	4973	13.8195	13.5094	20.8288	21.1521	0.595	8.73E-09	1.02E-06	Up-regulated
NM_030648	SETD7	80854	2.22745	2.39466	3.66858	3.66163	0.59654	1.00E-05	0.000424	Up-regulated
NM_138555	KIF23	9493	4.69182	5.7142	8.35285	8.34962	0.59656	4.87E-05	0.0015033	Up-regulated
NM_001284301	ANLN	54443	14.9571	15.2568	24.278	22.0355	0.59753	1.46E-10	2.73E-08	Up-regulated
NM_032440	LCOR	84458	1.02725	0.602338	1.59307	1.5109	0.60053	0.002724	0.0313537	Up-regulated
NM_152437	ZNF664	144348	14.7735	16.6274	23.8244	24.7096	0.60218	2.03E-09	2.68E-07	Up-regulated
NM_006599	NFAT5	10725	3.44775	2.4534	4.25575	5.67242	0.60343	0.000387	0.007467	Up-regulated
NM_012310	KIF4A	24137	5.62815	6.42165	9.3235	9.70336	0.6041	1.38E-06	8.25E-05	Up-regulated
NM_001271953	TPGS2	25941	5.0401	7.46638	10.1054	16.2769	0.60419	0.003549	0.0376911	Up-regulated
NM_001168	BIRC5	332	18.5071	19.5325	28.5279	30.2431	0.60549	7.97E-10	1.25E-07	Up-regulated
NM_014708	KNTC1	9735	2.45447	2.54416	3.88717	4.0736	0.60679	4.76E-06	0.0002365	Up-regulated
NM_001177639	DAG1	1605	1.01217	1.59816	2.15101	3.57407	0.6091	0.00338	0.0364205	Up-regulated
NM_018132	CENPQ	55166	4.66256	4.75978	8.762	7.69501	0.60985	0.000819	0.0132689	Up-regulated
NM_001126337	TUFT1	7286	11.6225	12.2193	17.2044	20.6562	0.61089	1.84E-06	0.0001035	Up-regulated
NM_003298	NR2C2	7182	1.732	1.918	3.3314	2.72467	0.6129	0.00011	0.0028144	Up-regulated
NM_012381	ORC3	23595	3.39999	3.60147	6.36277	5.67162	0.61703	0.000409	0.0077768	Up-regulated
NM_015250	BICD2	23299	4.66353	5.31983	8.1238	7.98063	0.62652	1.28E-06	7.79E-05	Up-regulated
NM_152562	CDCA2	157313	1.98468	2.64932	4.64831	3.87981	0.62938	0.00091	0.0144341	Up-regulated
NM_001142556	HMMR	3161	3.4112	3.22255	6.35024	5.17354	0.62988	0.000276	0.005786	Up-regulated
NM_001278462	MDM2	4193	0.800655	1.16751	1.58505	3.27856	0.63053	0.002468	0.0293324	Up-regulated
NM_024629	CENPU	79682	4.5648	4.44247	7.62149	7.54319	0.63881	4.24E-05	0.0013424	Up-regulated
NM_145810	CDCA7	83879	5.12444	5.92859	9.61584	9.01455	0.63937	3.61E-05	0.0011998	Up-regulated
NM_001135244	TCOF1	6949	2.26383	2.7162	5.28376	3.81856	0.64841	0.000428	0.0080256	Up-regulated
NM_005578	LPP	4026	1.93832	1.63966	3.41943	2.62991	0.65113	1.67E-05	0.0006476	Up-regulated
NM_001079812	DIAPH1	1729	2.01117	2.28867	3.74117	3.58954	0.65211	2.77E-05	0.0009975	Up-regulated
NM_170697	ALDH1A2	8854	16.8447	23.0438	43.9944	28.5157	0.65522	0.000298	0.0060947	Up-regulated
NM_001003722	GLE1	2733	9.10633	8.93634	14.7427	14.3724	0.65584	8.93E-10	1.34E-07	Up-regulated
NR_136611	PARP6	56965	4.09052	3.18688	7.22123	6.06873	0.65634	0.000315	0.0063921	Up-regulated
NM_004612	TGFBR1	7046	1.88076	2.5402	3.84572	3.98591	0.66388	8.94E-05	0.0023887	Up-regulated
NM_001024807	APLP1	333	2.55502	3.44981	5.26298	6.75763	0.66925	0.000708	0.0119724	Up-regulated
NM_020127	TUFT1	7286	8.57366	9.55385	16.294	14.114	0.67458	3.79E-07	2.79E-05	Up-regulated
NM_001948	DUT	1854	10.2168	11.6809	19.3211	17.8514	0.68015	1.39E-06	8.25E-05	Up-regulated
NM_001143841	TMEM106C	79022	15.2661	17.7492	45.2532	23.2724	0.68024	0.000702	0.0119111	Up-regulated
NM_206855	QKI	9444	0.360379	0.444739	0.873975	0.714677	0.68228	0.000392	0.0075062	Up-regulated
NR_027873	PAXBP1	94104	2.59895	2.53303	4.25067	5.01276	0.69588	3.04E-05	0.0010753	Up-regulated
NM_177424	STX12	23673	5.71898	6.57272	10.9242	10.2792	0.69758	6.06E-07	4.11E-05	Up-regulated
NM_182946	NIN	51199	1.018	1.20359	2.21254	2.04154	0.7023	0.000116	0.0029412	Up-regulated
NM_001202502	NIPSNAP1	8508	6.06731	7.61934	11.5464	14.5009	0.71961	5.04E-05	0.0015453	Up-regulated
NM_001319999	RACGAP1	29127	11.0092	9.84637	17.7858	17.7099	0.72652	2.41E-11	5.40E-09	Up-regulated
NM_002482	NASP	4678	12.5394	13.401	21.3426	23.1612	0.73926	2.11E-12	5.66E-10	Up-regulated
NM_001127380	SAA2	6289	14.5799	15.6263	25.3103	26.9924	0.7429	1.12E-10	2.20E-08	Up-regulated
NM_001099650	GXYLT1	283464	4.64917	5.67234	10.1285	8.466	0.74512	1.68E-07	1.40E-05	Up-regulated
NM_181471	RFC2	5982	7.59054	8.26763	14.9757	13.9094	0.74605	8.86E-07	5.73E-05	Up-regulated
NM_004724	ZW10	9183	3.64776	4.21873	7.24923	7.39685	0.75057	2.47E-06	0.0001364	Up-regulated

NM_080911	UNG	7374	5.20047	6.70238	10.9088	12.1601	0.7574	1.24E-05	0.0005069	Up-regulated
NM_014282	HABP4	22927	7.22039	6.60979	13.3693	11.7755	0.76666	3.45E-08	3.56E-06	Up-regulated
NM_001330700	TOP2B	7155	3.05627	2.58699	4.70967	6.20103	0.76893	4.83E-06	0.0002369	Up-regulated
NM_001284388	NOLC1	9221	1.77959	1.9532	5.47742	3.3285	0.77117	0.000138	0.0033741	Up-regulated
NM_001282873	UBR5	51366	1.04427	1.49908	2.25964	3.18154	0.77447	4.95E-05	0.0015224	Up-regulated
NM_002466	MYBL2	4605	12.0199	12.2255	21.431	21.2952	0.78124	1.66E-14	5.88E-12	Up-regulated
NR_034009	SRSF6	6431	2.76951	2.30268	4.93355	5.12781	0.81054	7.72E-07	5.11E-05	Up-regulated
NM_203504	G3BP2	9908	14.5459	15.4901	27.0479	26.5294	0.81073	1.20E-20	6.30E-18	Up-regulated
NM_004741	NOLC1	9221	4.35879	4.06316	7.17679	12.1563	0.84545	1.00E-05	0.000424	Up-regulated
NM_001320570	ADAM10	102	0.975843	1.26181	3.75021	2.372	0.84847	3.62E-05	0.0012014	Up-regulated
NM_014829	DDX46	9879	0.98689	1.42565	3.94855	2.60339	0.87653	1.64E-05	0.0006379	Up-regulated
NM_001034	RRM2	6241	3.79539	5.4564	10.3266	9.87954	0.88529	3.53E-07	2.62E-05	Up-regulated
NM_001272053	MRFAP1	93621	4.85644	6.814	12.2615	14.4572	0.89755	7.98E-07	5.25E-05	Up-regulated
NM_001284389	NOLC1	9221	7.45924	10.3423	20.6681	18.5189	0.95587	9.65E-10	1.43E-07	Up-regulated
NM_198334	GANAB	23193	51.8807	52.5783	101.576	101.819	0.95965	3.23E-70	1.78E-66	Up-regulated
NM_022111	CLSPN	63967	0.816136	1.04094	2.06914	2.45689	0.96259	1.15E-07	1.02E-05	Up-regulated
NM_001287135	CDK14	5218	3.99112	4.60451	8.98004	9.21082	0.98221	8.02E-15	3.04E-12	Up-regulated
NM_003290	TPM4	7171	70.618	77.9118	146.57	154.443	0.99553	2.30E-35	3.15E-32	Up-regulated
NM_001142269	GGCX	2677	1.2031	0.959631	2.87471	3.08918	1.17446	2.38E-12	6.21E-10	Up-regulated
NM_015154	MESDC2	23184	5.41018	6.06701	15.1009	14.6192	1.27029	4.72E-28	5.19E-25	Up-regulated
NM_001328615	HSD3B1	3283	6.60148	7.52487	21.324	22.582	1.41155	1.37E-21	7.93E-19	Up-regulated
NM_001293696	SEPT9	10801	0	0.016527	12.6545	9.95299	3.85441	2.73E-84	3.00E-80	Up-regulated