Cell culture

Human hepatocellular carcinoma cell lines Huh7 (RRID: CVCL_0336), HCC-LM3 (RRID: CVCL_6832), MHCC97H (RRID: CVCL_4972) were purchased from Shanghai Institutes of Biological Sciences (Shanghai, China). All cells were routinely cultured in the minimum necessary medium (MEM, BI, Israel) supplemented with 10% fetal bovine serum (FBS, BI), penicillin (100units/ml) and streptomycin (100g/ml), and cultured in a thermostatic incubator (Thermo Scientific, USA) with a humidified environment of 5% CO\textsuperscript{2} and 37 ℃.

RNA extraction and RT-qPCR

Total RNA was isolated using FastPure Cell/Tissue Total RNA Isolation Kit V2 (Vazyme Biotech, Nanjing, China) and cDNA was synthesized with HiScript II Q RT SuperMix for qPCR (Vazyme Biotech, Nanjing, China) according to the manufacturer’s protocol. Bio-Rad QX100 Droplet Digital PCR system (USA) was used to measure expression RNA by SYBR Green (Vazyme Biotech, Nanjing, China). The method for calculating the relative RNA amount was described in our previously study. All premiers were obtained from Tsingke Biological Technology (Beijing, China) and presented in Supplementary Table 1

Western blotting

Total proteins were extracted from tissues or cells using precooled RIPA buffer (Beyotime, Shanghai, China) containing protease and phosphatase inhibitors (Thermo Scientific, USA). Protein quantification was performed using the Bicinchoninic Acid protein assay kit (Thermo Scientific, USA). The same amount of protein samples was separated by 4-12% SDS-PAGE (GenScript, Nanjing, China) and then transferred to a 0.45 μm PVDF (Millipore, USA). After blocking with 5% skim milk in TBST buffer for 1 h, the membrane was incubated with the corresponding primary antibody at 4 ℃ overnight. After washing with TBST buffer for 3 times, the membrane was then incubated with enzyme-labeled secondary antibody at room temperature for 1 h.
Imaging system (Bio-Rad, USA) and enhanced chemiluminescence detection kit (Servicebio, Wuhan, China) were used for Western blotting. GAPDH was chosen as loading control. All the antibodies used in the study were listed in Supplementary Table 2.

**Immunohistochemistry (IHC)**

The IHC staining of TMA cohort was applied to determine expression of RBM15 protein and the connection between RBM15 and prognosis of HCC patients. IHC intensity scores and percentage of positive cells was defined as we described in our previous study.\(^\text{10}\) All score was assessed by two pathologists who were unaware of the prognosis of patients independently. Besides, subcutaneous tumor specimens from mice were fixed with formalin and embedded in paraffin. Then IHC staining of RBM15, YES1 and PCNA were performed on these tumors.

**RNA interference and plasmids.**

Small interfering RNAs (siRNA) against RBM15, YES1, IGF2BP1, IGF2BP3, YTHDF1 and negative control RNAs (siNC) were synthesized by Shangya Biotechnology (Hangzhou, China). pcDNA3.1-RBM15, pcDNA3.1-YES1 and empty vector were obtained from RPTbio (Hangzhou, China) for overexpression assays. Transient transfection was performed according to the manufacturer’s protocol by jetPRIME Polyplus Kit (France). All the sequences were summarized in Supplementary Table 3.

**Construction of stable knockdown cells**

Lentiviruses expression small hairpin RNAs (shRNAs) targeting RBM15 (shRBM15#1, shRBM15#2 and shNC) were obtained from Zorin(Shanghai, China). Huh7 and HCC-LM3 cells were applied to establish stable RBM15 knockdown models. Infected cells were selected by 3\(\mu\)g/ml puromycin for two weeks before subsequent assays. All the targeted sequences were listed in Supplementary Table 3.
Cell proliferation assay, colony formation and EdU incorporation assay.

Cell proliferation ability was determined by Cell Counting Kit-8 according to the manufacturer’s protocol. In colony formation assay, 1.5× 103 cells were plated in 6-well cell culture plate with three repetitions. After incubation of two weeks, the plates were fixed by paraformaldehyde and stained with 1% crystal violet for 10min. In Edu assay, A 5-ethynyl-20-deoxyuridine (EdU) assay kit (Ribobio, Guangzhou, China) was used to evaluate the proliferation ability of HCC cells according to the manufacturer’s protocol. The results were visualized by a fluorescence microscope.

Migration and invasion assays

In migration or invasion assays, a 24-well plate was used with a transwell filter insert (Corning, NY, USA) with a pore size of 8 μm. In the invasion experiment, diluted matrix was added to the transwell filter insert in advance. 8 × 10^4 HCC cells in serum-free medium were placed in the upper cavity, and then the medium containing 10% fetal bovine serum was added to the lower cavity. After 48 h (migration) or 72 h (invasion) culture at 37 °C, the submembranous cells were fixed and stained with crystal violet. Then cell counts in five random domains were then performed under the microscope.

Subcutaneous xenograft experiments

Four-week-old male Balb/c nude mice were obtained from Shanghai Experimental Animal Center of Chinese Academic of Sciences (Shanghai, China). 5 × 10^6 Huh7 and HCC-LM3 cells resuspended in 100μl PBS were subcutaneously injected to the left flank of the mice (randomly selected, five mice per group for Huh7 cells in the first time and ten mice per group for HCC-LM3 cells in the second time. No blinding was performed). Tumor sizes were measured regularly. After feeding of more than 3 weeks, mice were sacrificed and tumors were surgically dissected for histology analyses. The tumor volume was calculated with the equation: (length×width^2)/2. The animal experiments were approved by the Ethics Committee for Laboratory Animals of the
First Affiliated Hospital, Zhejiang University.

**RNA immunoprecipitation (RIP)**

Magna RIP kit (Millipore, Germany) was applied to conduct RIP assay in accordance with manufacturer’s recommendation. In Brief, magnetic beads were mixed with anti-IGF2BP1 (Abclonal, China) and anti-rabbit IgG (Millipore, Germany) and added to sufficient cell lysates. Then, target RNA-protein complexes were eluted and purified for qPCR.

**Luciferase reporter assay**

cDNAs containing 3’ UTR sequence of YES1 were cloned into luciferase reporter vectors (pcDNA3.1 vector including firefly and renilla luciferase). For mutant report plasmids, two adenosine (A) in m6A sties were replaced with cytosine (C). RBM15-knockdown HCC cells were transfected with wild-type or mutated YES1 reporter plasmids. After 24h, the luciferase activity was tested using Dual Luciferase Reporter Assay Kit (Vazyme Biotech Co.,Ltd, China) The inserted sequences were listed Supplementary Table 4

**RNA decay assay**

RNA decay assay was performed to evaluate RNA stability. HCC cells were cultured in 6-well plates followed by treatment of RBM15 knock-down. Actinomycin D (MCE, HY-17559) was added into each well. After 0, 12 and 24h, we collected cells to quantify the relative abundance of YES1 mRNA (relative to 0h).
library(rms)
library(foreign)
library(survival)

setwd("C:/R")
data<-read.csv("rbm15.csv")
View(data)
str(data)
data$TNM<-factor(data$TNM,labels=c('I', 'II', 'III', 'IV'))
data$RBM15<-factor(data$RBM15,labels=c('Low','High'))
data$Age<-factor(data$Age,labels=c('≤73','>73'))
str(data)

dev<-data

y<-Surv(dev$OS,dev$Status ==1,type="right")
mod1<-coxph(y ~ RBM15 + TNM+Age, data=dev)
summary(mod1)
y<-Surv(dev$OS,dev$Status ==1,type="right")
mod2<-coxph(y ~ TNM, data=dev)
summary(mod2)

ddist <- datadist(dev)
options(datadist="ddist")
units(dev$OS) <- "Months"
fcox1 <- cph(Surv(OS, Status) ~ RBM15 + TNM+Age, surv=T,x=T, y=T,data=dev)
med <- Quantile(fcox1)
nom.sur1 <- nomogram(fcox1, fun=function(x) med(lp=x), funlabel="Median Survival Time",lp=F)
plot(nom.sur1)
surv <- Survival(fcox1)
nom1 <- nomogram(fcox1, fun=list(function(x) surv(36, x), function(x) surv(60, x)), funlabel=c("3-years Survival Probability", "5-years Survival Probability"),lp=F)
plot(nom1)
library(nomogramEx)
nomogramEx(nomo=nom1, np=2, digit=9)

dev$RBM15point <- ifelse(dev$RBM15=="Low",0, 19.45)
dev$TNMpoint <- ifelse(dev$TNM=="I",0, ifelse(dev$TNM=="II",13.75, ifelse(dev$TNM=="III",52.29, 100))))
dev$Agepoint <- ifelse(dev$Age=="≤73",0, 27.89)
dev$points1 <- dev$RBM15point + dev$Agepoint + dev$TNMpoint

dev$RBM15point <- ifelse(dev$RBM15=="Low",0, 100)
dev$TNMpoint <- ifelse(dev$TNM=="I",44.05, ifelse(dev$TNM=="II",0, ifelse(dev$TNM=="III",42.68, 90))))
dev$points1 <- dev$RBM15point + dev$TNMpoint

fcox2 <- cph(Surv(OS, Status) ~ TNM, surv=T,x=T, y=T,data=dev)
med <- Quantile(fcox2)
nom.sur2 <- nomogram(fcox2, fun=function(x) med(lp=x), funlabel="Median Survival Time",lp=F)
plot(nom.sur2)
surv <- Survival(fcox2)
nom2 <- nomogram(fcox2, fun=list(function(x) surv(36, x), function(x) surv(60, x)), funlabel=c("3-years Survival Probability", "5-years Survival Probability"),lp=F)
plot(nom2)
library(nomogramEx)
nomogramEx(nomo=nom2, np=2, digit=9)
source("stdca.R")

dev$three.years.Survival.Probabilitynew1=c(summary(survfit(mod1,newdata=dev),times=36)$surv)

dev$three.years.Survival.Probabilitynew2=c(summary(survfit(mod2,newdata=dev),times=36)$surv)

library(survival)
library(survivalROC)
nobs<- NROW(dev)
cutoff1<- 36
SROC1= survivalROC(Stime = dev$OS, status = dev$Status, marker = dev$points1, predict.time =cutoff1, method= "KM")
cut.op1= SROC1$cut.values[which.max(SROC1$TP-SROC1$FP)]
cut.op1 

plot(SROC1$FP,SROC1$TP, type="l", xlim=c(0,1), ylim=c(0,1),
    xlab = paste( " False Positive","n", "AUC = ",round(SROC1$AUC,3)),
    ylab = " True Positive", col="red")
abline(0,1)
legend("bottomright",c("ROC curve of 3-years overall survival"),col="red",lty=c(1,1))

SROC2= survivalROC(Stime = dev$OS, status = dev$Status, marker = dev$points2, predict.time =cutoff1, method= "KM")
cut.op2= SROC2$cut.values[which.max(SROC2$TP-SROC2$FP)]
cut.op2 

plot(SROC2$FP,SROC2$TP, type="l", xlim=c(0,1), ylim=c(0,1),
    xlab = paste( " False Positive ","n", "AUC = ",round(SROC2$AUC,3)),
    ylab = " True Positive", col="blue")
abline(0,1)
legend("bottomright",c("ROC curve of 3-years overall survival"),col="blue",lty=c(1,1))
nobs<- NROW(dev)
cutoff1<- 60
SROC1= survivalROC(Stime = dev$OS, status = dev$Status, marker = dev$points1, predict.time =cutoff1, method= "KM")
cut.op1= SROC1$cut.values[which.max(SROC1$TP-SROC1$FP)]
cut.op1 

plot(SROC1$FP,SROC1$TP, type="l", xlim=c(0,1), ylim=c(0,1),
    xlab = paste( " False Positive ","n", "AUC = ",round(SROC1$AUC,3)),

ylab = " True Positive", col="red")
abline(0,1)

legend("bottomright",c("ROC curve of 5-years overall survival"),col="red",lty=c(1,1))
SROC2= survivalROC(Stime = dev$OS, status = dev$Status, marker = dev$points2, predict.time =cutoff1, method= "KM")
cut.op2= SROC2$cut.values[which.max(SROC2$TP-SROC2$FP)]
cut.op2

plot(SROC2$FP,SROC2$TP, type="l", xlim=c(0,1), ylim=c(0,1),
     xlab = paste( " False Positive ","n AUC = ",round(SROC2$AUC,3)),
     ylab = " True Positive", col="blue")
abline(0,1)
legend("bottomright",c("ROC curve of 5-years overall survival"),col="blue",lty=c(1,1))

library(timeROC)

model1ROC <- timeROC(T=dev$OS,delta=dev$Status,marker=dev$points1,cause=1, weighting = "marginal",times=c(12, 24, 36,48, 60),iid=TRUE)
plotAUCCurve(model1ROC)

model2ROC <- timeROC(T=dev$OS,delta=dev$Status,marker=dev$points2,cause=1, weighting = "marginal",times=c(12, 24, 36,48, 60),iid=TRUE)
plotAUCCurve(model2ROC)

plotAUCCurve(model1ROC,conf.int=F,col="red")
plotAUCCurve(model2ROC,conf.int=F,col="blue",add=TRUE)

legend("topright",c("RBM15 model","TNM model"),col=c("red","blue"),lty=1,lwd=2)
Fig S1  The ROC curves represented the discrimination of models measured by the C-index. a. for 3-years overall survival (red curve for RBM15 model and blue curve for TNM model); b for 5-years overall survival (red curve for RBM15 model and blue curve for TNM model)
Fig S2 Knockdown efficiency on HCC cells via qPCR. a The efficiency of RBM15 knockdown on Huh7, HCC-LM3, MHCC97H and SNU449; b The efficiency of YES1 Knockdown on HCC-LM3 and MHCC97H. c The efficiency of stable RBM15 Knockdown on Huh7 and HCC-LM3 (** p < 0.01, *** p < 0.001, **** p < 0.0001; and t-test). The data are presented as means ± SD.
Figure S3 RBM15 promotes tumor growth and migration / invasion capability of HCC cell in vitro. a Negative control or siRNA (si-RBM15#1 and #2) was transfected into Huh7. The efficiency of knockdown was tested by western blotting and the proliferation capacities of HCC cells were detected by CCK-8 and colony formation assays (** p < 0.01, *** p < 0.001, **** p < 0.0001; two-way ANOVA and t-test); b Edu assay was applied to compare the proliferation abilities of Huh7 cells (scale bar, 200μm); Bar charts showed the percentage of cells in S phase based on the results of Edu assay (** p < 0.01; t-test); c Wound healing assays were performed to compared the migration capabilities of Huh7 cells (scale bars, 200μm); The percentage of healed area were quantified by bar charts (* p < 0.1, *** p < 0.001, **** p < 0.0001; t-test); d Transwell assays were
applied to detect the migration and invasion abilities of Huh7 cells after silencing RBM15 (scale bars, 200μm); Bar charts showed the relative count of HCC cells which passed through the chamber membranes when referred to negative control groups (** p < 0.001, **** p < 0.0001; t-test); The data are presented as means ± SD.
Figure S4 The results of GO analysis for the identification of DEGs in HCC. a Biological process; b Cellular component; c Molecular function
Figure S5 other results for identifying the “reader”. a Expression of IGF2BP1 between tumor and normal tissues in HCC; b expression of IGF2BP3 between tumor and normal tissues in HCC; c expression of YTHDF1 between tumor and normal tissues in HCC; d YES1 was positively associated with IGF2BP1 expression; e High expression of IGF2BP1 indicated worse prognosis; f The alteration of YES1 after knockdown of IGF2BP3 and YTHDF1 (* p < 0.05, ** p < 0.01, *** p < 0.001; t-test); The data are presented as means ± SD.
Figure S6 YES1 is associated with immune infiltration. a YES1 and B cell; b YES1 and CD8\(^+\) T cell; c YES1 and CD4\(^+\) T cell; d YES1 and Macrophage; e YES1 and Neutrophil; f YES1 and Dendritic cell.
| Gene symbol     | Forward primer                  | Reverse primer                  |
|-----------------|---------------------------------|---------------------------------|
| GAPDH           | GGAGCGAGATCCCTCCAAAAT           | GGCTGTGTCATACCTTCTCATGG         |
| RBM15           | AGCCGCGAGTGATGATACCG            | GCCCGAAAGAATTGGTGCTC            |
| YES1            | CTCAGGGGTACGCCTTTGG             | CACCACCGTTAAACCAGCAG            |
| ARL1            | TCTGTTTGGAACTCGGGAATG           | AAGGTTTTGGTACGTACCGT            |
| YES1-MeRIP-primer| TGCACAAATCTGCCCCAAAATATAAAG     | TTTGTGCAACCATAATCTGGA           |
| IGF2BP1         | CAAAGGAGCGCGGAAAAATCAAT         | CGTCTCACTCTCGGTTTCA             |
| IGF2BP3         | TATATCGGAAAACCTCAGCGAGA         | GGACCGAGTGGCTCAACTTCT           |
| YTHDF1          | ACCTGTCCAGCTATTACCCG            | TGGTGAGGTTATGGAATCGGAG          |
Supplementary Table 2. Antibody employed in this study

| Antibody                  | Source                  | Identifier | RRID       |
|---------------------------|-------------------------|------------|------------|
| GAPDH                     | Proteintech             | Cat#10494-1-AP | AB_2263076 |
| RBM15                     | Cell Signaling Technology | Cat#A4936  | AB_2765940 |
| Anti-m6A antibody         | Synaptic systems        | Cat#202003  | AB_2279214 |
| YES1                      | Proteintech             | Cat#20243-1-AP | AB_10697656 |
| p-Src                     | Cell Signaling Technology | Cat# 2113  | AB_2106051 |
| t-p38                     | Cell Signaling Technology | Cat#8690T  | AB_10999090 |
| p-p38                     | Cell Signaling Technology | Cat#4511T  | AB_2139682 |
| t-p44/p42 (Erk1/2)        | Cell Signaling Technology | Cat#4695T  | AB_390779  |
| p-p44/p42                 | Cell Signaling Technology | Cat#4370T  | AB_2315112 |
| IGF2BP1 (RIP)             | ABclonal                | Cat#A13581  | AB_2760443 |
| PCNA (IHC)                | Cell Signaling Technology | Cat#13110  | AB_2636979 |
Supplementary Table 3. RNA interference and plasmids employed in this study

| Gene symbol | Targeted sequence                                                                 |
|-------------|----------------------------------------------------------------------------------|
| siRBM15#1   | GGUGAUAUGUUGGGCAUAUA                                                             |
| siRBM15#2   | UAGCAGGGCCCAAUGGUUA                                                              |
| shRBM15     | GGUGAUAUGUUGGGCAUAUA                                                             |
| siYES1#1    | CCCACUACAGUGUCACCAU                                                              |
| siYES1#2    | GGUGGAAUCAUAUAUCACAAA                                                           |
| siIGF2BP1#1 | CUCCAAGUUCGUAUUGGUUA                                                             |
| siIGF2BP1#2 | UGAAGAUCCUGGCCCAUAUA                                                             |
| siIGF2BP3#1 | CGGUGAAUGAAGACUCAGAAUU                                                         |
| siIGF2BP3#2 | GCUGCUGAAGAGUGAUAUU                                                             |
| siYTHDF1#1  | CCGCGUCUAGUGUGUUCAGAA                                                           |
| siYTHDF1#2  | CAGGGCGAGAUAACAGCAGGA                                                          |
|             | ATGAGGACTGCAGGGCGGGACCTGTGCGCGCGCGG                                             |
|             | GAGTCACAGTGACGCGGGCGCGCGGAGTTCTACGAGCTCAGCC                                     |
|             | GGAGACGACCTCCAGACAGCCCAACAATGAAGGG                                               |
|             | ACAAAGACAGCTGGAGGATGAAGGCCCGGGGTGAGCGGGGGAGTGCAGTCAGTGCAGCCGAGTG                |
|             | TCCAGCAGCAGCCGGACGTCTCCGAGGATGAGCAGCGAGTCAC                                   |
|             | GTTTCCTCTGGGGCAGGCCTCAGTGCTCCGAGGCGCATGCC                                      |
|             | GGGACGCGCGCGGGATACAAAGACTCTGAAGATAAGCC                                          |
|             | GAGACGTGCCTGGAGCTGGAGCCAGACAGCAGCCGAGTCAG                                    |
|             | TGGACTGCTGACGCGCTGAGCCAGACAGCAGCCGAGTCAG                                     |
|             | TCTGAGAATATCATGCTGCTGCGGTTCCTGG                                              |
|             | CAGCGGGAGATGACGCGGCTGTTTGTGAAGCCAGACGAGCATGCC                                |
|             | GGGCGAGACGAGGACGCGGGCGCCAGACGAGCATGCC                                        |
|             | CAGAGGCCGCCCTGGGTCTTACGAGACGAGCCAGACGAGCATGCC                                 |
|             | CATGAGCAGATGAGCAGCGGGGGTCCTTGAGCGCCGGCCAGACGAGCATGCC                           |
|             | TTCCCTCTGGGCTGTGGGCTGGACTTACGAGAAGAGACTTACGAGACGAGCATGCC                       |
|             | CCGGCTGCAGAAGTTTAGGTGTTGAGGCGCCGAGGAGACGAGCATGCC                              |
|             | TCCACCTGGCCACCTATGGCGACGGAGCGCCGGCCAGACGAGCATGCC                              |
|             | GAGAAAGAGACTACCCGGTTCTATAGAGAGAGTGAGGCGCCG                                      |
| RBM15 pcDNA 3.1 | CCTGCACTACAGTCTTGAGCCAAAGGTTGAGAGCTTG                                       |
| YES1 pcDNA 3.1 |
|----------------|
| AGCGATCAGGAGATCTCCACCTGGATCCTCGGGAATGGGAAGAGAGAAAGGGGAGA |
| CTCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGGTCGAGAGAGACCG |
| AGTGTATAGATATATATTTTACGATGGAAGGAGGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CTCTCCAGTACCTGTCTGGTGAGCAGAGAGACCG |
| GCCAGTGCTGCTCTTCCCAGAGAGAGACTTGGGAGAAGG |
| ATCGCCGAGGAAAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CACGCCAGGAGAAAGGGGAGAAGGAGGAGAGACTTGGGAGAAGG |
| CAGTACATCTACGTATTAGTCATCGCTATTACCATTGGA |
|--------------------------------------------|
| TAGATGCCTTTGGGCACTACATCAATGGCCCTGGGAT    |
| AGCCGGTTTAGACTCAGGGGAAATTTCCAAGTCTCCACC  |
| CCAATGGCTAATGGGGAGTTTGGGTCGACAAAAA       |
| ATCAAGGGCGGATTTCACCAAAATGTCTAAAACCTCCG   |
| CCCACTTGACCAATGGCCGATAGGGGTACTACAGGT    |
| GGGAGGCTCATAATAAGCAGATTGTCTGCTGACTAATA   |
| GAAACTCCCACGCTCTACTGGTTTATCGAAAAATTATA   |
| CAGACTCAGATAGGGAGACCCAAGCTTGCTAGTTAAA   |
| GCTTGATCCGGACTCGGAGTCCGACACACACAAAGGCA   |

```plaintext
aaagtaagaaacaaaggtcccacattataataacagtccagagcctgctgctgatgtagctgctgatggtattgctaattgctgctgttgttgttgttgtgttgtgttgtgttgtgttgtgttgtgtgttgtgttgtgttgtgtgttgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtgtg
CCATGGCGATGCCTGCTTGCCGAATATCATGGTGGGA
AAATGGCCCGTTTTTCTGGAATTACGACTGTGGCCG
GCTGGGTGTGGCGGACCCGCTATCAGGACATAGCGTT
GGTACCCCTGATATTCTGGAAGAGCTTGGCCGGAATATC
ATGGGCTGACCGCTTCCCTCGCTTTACGGTATCGC
CGCTCCCGATTCGCAGCGCATCGCCTTCTA TCGCCTT
CTTGACGAGTTCTTCTGAGCGGGACTCTG
GGGTTCG
CGAAATGACCGACCAAGCGACGCCCAACCTGCCAT
CACGAGA TTTCGATTCCACCGCCGCCTTCTA TGAAA
GGTTGGGCTTCGAATGTTTCGCTGGAGTTGTGATTCTG
ACCCTGACCTCCTAGTAAGCTTGGCGCTATTGAT
GTGTTCTGTTTCTGTGGAATTGTGATTACCCGCCTC
ACAATTCACACAACATCAACGCGGAACACATAAA
GTGAAAGCCTGGGGTGCTAAATGAGTGAAGCTACT
CACATTAATTTGCGTTCGCTACTGCCGCGTTTCCA
GTGGGAAACCTGTGTCGCCAGCTGCAATTAGAAT
CGGCCAACGCGCGCGGGAGAGCGGTTTGCGTAATCG
GGCCGCTTTCGCCCTTCTCGCCTACTGACTCGCTGC
GCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTC
ACTCAAAGGCCGTAATACGTTATCCACAGAATCAG
GGATAACGCAAGAAAGACATGTGAGCAAAAGG
CCAGAAAAGGCCAGGAACACATCGTAAGCTGCAGG
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GACATCACAAAATCGACGCTCAAGTCAAGAGG
GGCCAAACCGACAGCTACTAAGATACCAGCCGCT
TTCCCTGGAAGCTCCTCGCCTACTCCGTCTTC
CGACCTGCGCTTTACCGTATACGCTGCGCCTTTTC
TCCCTTCGGGAACGCTGGCTTTTCTCATAGCCTAC
GCTGTAGGTATCCTCAGTTCCGCTGGTCTCGTCTCC
CCAAGCTGGGTGCTGTCAGCAACGCCCGTTCCAG
CCGACCGCTGCCCTTATCGGTAACTATCGTCTT
GAGTCTCCACCCGGTAAAGACAGCTCTATCGCCAC
GGGACGAGCCACTGCTAAACGGAATACGAGACAGCAG
GGATGAGTGAGCCAGTACTGTTGAGTTGAGTGGTT
GGCTCGAAGCTCCTGGAAGCAGTTACTCGCTGAA
AAAAGAGTTGAGCTGCTTCCGCTACCAGAAACACC
ACCGCTGGTACGCGGTGTTTTTCTGGCTCAAAGCAG
CAGATTACGCGCAGAAAAAGGATCTCAAGAAGA
TCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTG
GAACGAAAAACTCAGTTAAGGGATTTTGGTCTAGTA
GATTATCAAAGAGATCTTCACCTAGATCTTTTAAAA
TAAAAATGAAATTTTAAATCAATCTAAAGTATATAT
GAGTAAACCTGGTCTGACAGTATCCAAATGGTTTATA
AGTGAGGCACCATATCTCAGCGATCTGTCTATTTCTGTT
CATACCTAGGGCAGACCTGCTCCACCCGTGTAGATAAA
CTACGATACGGGAGGGCTTACCATCTGGCCCCAGTG
CTGCAATGATACCGCGAGACCCACGCTACCGGCTC
CACTATCCAGTTATTAGTTGGCCGGAAGGCTAG
AGTAAGTATGTTGCTCAATAGGGCTGCAAGCTG
TGTTGCCATTTGCTACAGGCATCGTGTTGTCAGCTC
GTCGTGTGTTATGCTTTCAGCTACCGGCTACC
ACGATCAAGGCGAGTTACCATAGTCCCCCATGTTGTG
CAAAAAAGCGGTAGCTCCTTTTCTGACTGAGGTAAC
TCAACCAAGTCTTCTGAGAATAGTGTAATCGCGGCA
CCGAGTTGGCTCTTGCCGCGTAATACGCGGGAAT
ACCCGGCGCATACAGCAGACTTAAAAGTGCTCTATC
ATCGAAAAACGTCTTCCGGCGCAATACGCGGTAAT
GATCTTTACCGCTGTTGAGATCCAGTTGATGTAACC
CACTCTGTCACCCACAATGTCTTTCAGCCTTTTAC
TTTACCCACGTTTTCTGGTGAGCACAAGACGAGA
GGCAAAATGCGCAAAAAAGGGAATAAGGGCGGAC
ACGAAAAATGTTGAATACCTCACTCTTCTCTTTTTCAA
TATTATGGAAGCATTTACGGTTATTGCTCATGA
GGGATACATATTTGGAATGTTATTTAGAAAGAAAAACA
AATAGGGTTCGCCGACACATTCCCAGGAAAAAGTGCC
ACCTGACGTC
Supplementary Table 4: The inserted sequences employed in luciferase reporter assay

| Factor       | Sequences                                                                 |
|--------------|---------------------------------------------------------------------------|
| YES1-3UTR-WT | TTCAAGTAGCCTATTTTATATGCACAAATCTGCCAAAAATATAAAGAACTTTGTA                  |
|              | GATTTTCTACAGGAATCAAAAGAAGAATACTTTTTACTCTGACTGATTTTTTAAT                 |
|              | GGTAAACTGGGAATCCCCAGATATGGTTGCACAAAAACCACCTTTTTTTTCCCCAAAGT             |
|              | ATTTAACTCTAAATGTACACAAATTTATATCCAGTGATTTTTACAGGGTACCCCAAAACCA          |
|              | AAATAGAGCTAAGATACTGTGACAGTGTTGGGTACAGCATGGTAAATGAAAGGAC               |
|              | AGTGAGGCTCCTGCTTTATTTATAATCATTTTCTTTTTTTTTTTTTCCCCAAAAAGTCAG            |
|              | ATTTGCTCAAAAGAAAATTTTTATTTGTTACAGATAAATCAGGACAGATAAAAAAGC             |
|              | TATACCATAAATCATAATAATGGGAATATCATGGGACCAAAATATCCATTTCC                 |
|              | AGTTTTTTAAAGTTTTCTTTGCATTATTTCTCAAAAGTTTTTTCTAGTTAACCAG               |
|              | TCAGTATGCAATCTTAATATATGCTTTCTTTTCATGGACATGGCCAGGTTTTTCA               |
|              | AAAGGAATATAAACCAGGATCTCAAACCTTGATAAATGTGATGACCCACAGAGTGGGA            |
|              | ATTTGAAAGTATAATGCACTTTAATATTCTATGTCATGGAACATGGCAGGTTTTTCA             |
|              | AACTTTTTTCACTTCAGTCTTTTCTGAGATTTTGACTTGAATAAATGAAAGGTAC              |
|              | TAGAAAGTGAGTAAATCTTGATAGGTTTGCATTGATTTTTTAAGGCCATATATTAAT             |
|              | TGAAAACCTACTGTCCAAATCAA                                               |
| YESI-3UTR-Mut | TTCAAGTAGCCCTATTTATATGCACAAATCTGCCAAAAATATAAAGACCTTGTGTAGATTTT |
|-------------|---------------------------------------------------------------|
|             | CTACAGGAATCAAAAGAAGAAAAATCTTTTTACTCTGTCATGTTTTTAATGGTAAACCCTGGA |
|             | ATCCCAGATATGGTTGCACAAAAACCACCTTTTTTTTCCCAAGTATTAAACTCTAAATGTAC |
|             | CAATGATGAATTATCAGCGTATTTCAGGGTCCAACAAAAATAGAGCTAAAAGATACTGAT |
|             | GACAGTGTGGGTGACAGCATGGTAATGAAGGACAGTGAGGCTCCTGCTTATTATAAAAA |
|             | TCATTCCCTTTCTTTTTTTCCCCAAAGTCAAGTTGCTCAAGAGAAAAATTATTATTATTGA |
|             | CAGATAAAACCTTGAGAGATAAAAAGCTATACCATAATAAATCTAAAATTAAAGGAATAT |
|             | CATGGGACCAAAATAATTCCTCCATCAGTTTTTTAAGTTTCTTGCAATTTATTATCTCAA |
|             | AGTTTTTTCTAAAGTTAAACAGTCAGTATGCAATCTAATATGCTTTTCTTTTGATGGA |
|             | CATGGGCCAGGTTTTTCCAAAGGGAATATAAACAGGATCTCAAACCTTGATTAATGTTAG |
|             | ACCACAGAAGTGGAATTTGAAAAGTATAGCAGTACATATTATATTAGCTTTTCAATGGAAC |
|             | TGAAAAGAAATAGAAACTTTTTTCACATCTCATTCCATTTCTGAGAGGTTTCTGAATAGAATAAT |
|             | GAAGGTAACATAGAAATGAGTTAAATCTTGTATTGAGGTGCTTATTGTTTAAAGGAATAT |
|             | ATATAATTGAAACTACTGTCACAATCAAA |
Supplementary Table 5. Univariate and multivariate Cox analysis of Cohort-1 for overall survival and disease-free survival

| Factors                    | Overall Survival |                       | Disease Free Survival |                       |
|---------------------------|------------------|------------------------|-----------------------|-----------------------|
|                           | Univariate analysis | Multivariate analysis | Univariate analysis | Multivariate analysis |
|                           | HR   | 95%CI | P   | HR   | 95%CI | P   | HR   | 95%CI | P   | HR   | 95%CI | P   |
| Age                       |       |       |     |       |       |     |       |       |     |       |       |     |
| ≤60                       | 1.00  | 0.506 | 0.506 | 1.00  | 0.506 | 0.506 | 1.00  | 0.506 | 0.506 | 1.00  | 0.506 | 0.506 |
| > 60                      | 0.80  | 0.42-1.54 | 0.83  | 0.35-1.97 | 0.83  | 0.35-1.97 | 0.83  | 0.35-1.97 | 0.83  | 0.35-1.97 | 0.83  | 0.35-1.97 |
| AJCC stage                |       |       |     |       |       |     |       |       |     |       |       |     |
| Stage I-II                | 1.06  | 0.62-1.80 | 1.06  | 0.62-1.80 | 2.38  | 1.09-5.20 | 2.15  | 0.98-4.76 | 2.15  | 0.98-4.76 | 2.15  | 0.98-4.76 |
| Stage III-IV              |       |       |     |       |       |     |       |       |     |       |       |     |
| Tumor number              |       |       |     |       |       |     |       |       |     |       |       |     |
| Single                    | 1.61  | 0.93-2.79 | 1.12  | 0.52-2.42 | 1.12  | 0.52-2.42 | 1.12  | 0.52-2.42 | 1.12  | 0.52-2.42 | 1.12  | 0.52-2.42 |
| Multiple                  | 1.06  | 0.62-1.80 | 1.06  | 0.62-1.80 | 2.38  | 1.09-5.20 | 2.15  | 0.98-4.76 | 2.15  | 0.98-4.76 | 2.15  | 0.98-4.76 |
| Tumor size                |       |       |     |       |       |     |       |       |     |       |       |     |
| ≤5cm                      | 1.31  | 0.70-2.46 | 0.80  | 0.37-1.72 | 0.80  | 0.37-1.72 | 0.80  | 0.37-1.72 | 0.80  | 0.37-1.72 | 0.80  | 0.37-1.72 |
| > 5 cm                    |       |       |     |       |       |     |       |       |     |       |       |     |
| Tumor encapsulation       |       |       |     |       |       |     |       |       |     |       |       |     |
| Intact                    | 2.06  | 1.18-3.01 | 1.38  | 0.75-2.54 | 1.38  | 0.75-2.54 | 1.38  | 0.75-2.54 | 1.38  | 0.75-2.54 | 1.38  | 0.75-2.54 |
| Broken                    | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 | 1.24  | 0.29-5.27 | 1.24  | 0.29-5.27 | 1.24  | 0.29-5.27 | 1.24  | 0.29-5.27 |
| Microvascular infiltration|       |       |     |       |       |     |       |       |     |       |       |     |
| No                        | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 | 1.00  | 0.36-2.81 |
| Positive                  | 0.995 |       |     |       |       |     |       |       |     |       |       |     |

**Note:** p-values are provided for significant factors.
|                | 0.372 | 0.741 |
|----------------|-------|-------|
| **Cirrhosis**  |       |       |
| Yes            | 1     | 1     |
| No             | 1.39  | 0.68-2.84 | 1.16 | 0.47-2.85 |
| **AFP**        |       |       |
| ≤400 μg/L      | 0.503 | 0.105 |
| > 400 μg/L     | 1.21  | 0.70-2.09 | 1.83 | 0.88-3.81 |
| **RBM15**      |       |       |
| Low            | 1     | 1     |
| High           | 1.98  | 1.13-3.48 | 2.06 | 1.16-3.68 | 3.82 | 1.68-8.68 | 3.57 | 1.57-8.12 |
Supplementary Table 6. Down-regulated DEGs associated with RBM15

| Symbol  | NC1_FPKM  | NC2_FPKM  | NC3_FPKM  | KD1_FPKM  | KD2_FPKM  | KD3_FPKM  | FDR       | log2FC  |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
| ARL1    | 28.74541  | 30.53362  | 24.81846  | 3.64433   | 3.095859  | 4.618634  | 3.5E-115  | -3.14422|
| B4GALT5 | 36.47572  | 35.52025  | 35.42973  | 10.46131  | 10.88463  | 10.14649  | 3.5E-115  | -1.76694|
| EPB41L4B| 22.87252  | 22.10918  | 23.13082  | 5.989935  | 6.127581  | 5.606162  | 2.8E-106  | -1.92874|
| VTI1B   | 27.17256  | 31.3709   | 23.74763  | 3.627992  | 4.102638  | 2.849195  | 3.7E-106  | -2.60436|
| TBL1XR1 | 28.21743  | 31.05428  | 23.74763  | 6.760668  | 9.314571  | 8.136907  | 1.1E-80   | -2.0808  |
| KRT80   | 51.40853  | 49.62909  | 46.82152  | 8.444625  | 11.27863  | 9.860626  | 7.47E-78  | -2.26293|
| YES1    | 24.9545   | 24.55897  | 24.47059  | 6.609574  | 6.764911  | 9.84E-77  | 1.78789   |         |
| LPGAT1  | 10.66443  | 10.38001  | 10.27737  | 3.554056  | 3.477351  | 3.248721  | 1.6E-75   | -1.60904|
| UBE2G2  | 20.78699  | 20.27532  | 18.58916  | 7.06915   | 7.005584  | 6.96706   | 1.04E-72  | -1.80197|
| CMTM6   | 22.14637  | 23.23198  | 24.01542  | 5.595442  | 4.758319  | 6.005949  | 6.34E-68  | -2.03705|
| STK17B  | 9.500625  | 8.873977  | 9.19608   | 2.454562  | 2.802248  | 2.873529  | 5.74E-66  | -1.81326|
| SH3BGL2 | 7.09653   | 7.16356   | 6.792233  | 1.325508  | 1.650054  | 1.491665  | 3.4E-65   | -2.16969|
| RPA1    | 37.23274  | 39.88624  | 38.9987   | 15.8671   | 15.6534   | 14.5586   | 6.18E-65  | -1.3482  |
| EFCA1B14| 14.85284  | 14.27577  | 13.98861  | 4.10724   | 4.620489  | 4.434974  | 1.36E-62  | -1.68379|
| RDH10   | 27.97268  | 24.96361  | 28.13972  | 8.718064  | 7.695217  | 8.326754  | 1.53E-61  | -1.70255|
| COPZ1   | 117.1477  | 115.6929  | 106.7922  | 64.25903  | 52.77477  | 46.04437  | 2.32E-61  | -1.32041|
| UXS1    | 104.831   | 107.0737  | 108.4104  | 40.49685  | 44.31445  | 43.47657  | 2.71E-59  | -1.32643|
| NCEH1   | 31.6104   | 29.46279  | 30.18974  | 8.774097  | 10.55039  | 9.498687  | 5.89E-59  | -1.66613|
| LRRCC8  | 12.83303  | 10.99749  | 11.19432  | 3.541142  | 3.421082  | 2.937582  | 4.34E-55  | -1.78874|
| NIPAL3  | 5.946472  | 7.254726  | 6.510549  | 3.192789  | 3.484843  | 3.395693  | 4.89E-54  | -1.85395|
| CGGBP1  | 21.90593  | 21.0152   | 20.34236  | 7.659192  | 7.019073  | 8.689735  | 1.57E-53  | -1.42425|
| LIN7C   | 10.10886  | 8.905188  | 9.792185  | 2.584715  | 2.323075  | 1.960693  | 1.95E-53  | -2.00736|
| Gene   | 22   | 32   | 42   | 52   | 62   | 72   | 82   | 92   | 102  | 112  |
|--------|------|------|------|------|------|------|------|------|------|------|
| AIDA   | 25.48758 | 24.77009 | 23.33848 | 4.962245 | 6.704221 | 6.065707 | 5.68E-53 | -1.99216 |
| TTL    | 8.665182 | 8.330934 | 8.175505 | 3.599081 | 3.684361 | 3.453499 | 4.51E-52 | -1.23227 |
| AMMCR1 | 17.6363 | 15.08504 | 16.97448 | 4.707182 | 5.468175 | 5.166052 | 2.23E-51 | -1.6617 |
| TM7SF3 | 24.21615 | 23.70859 | 21.69289 | 6.320369 | 5.31951 | 5.886151 | 4.51E-48 | -2.02743 |
| MBTPS2 | 7.918523 | 8.124281 | 8.139624 | 2.656119 | 2.873389 | 2.632615 | 8.17E-48 | -1.5435 |
| NT5E   | 30.58139 | 29.66998 | 32.42075 | 12.26692 | 13.15077 | 12.98989 | 1.55E-47 | -1.39473 |
| LARP4B | 19.23254 | 17.8592 | 16.82643 | 5.676357 | 6.227329 | 4.525928 | 3.51E-47 | -1.68806 |
| ZMPSTE24 | 23.70745 | 24.09095 | 25.50526 | 9.21589 | 7.622664 | 7.948209 | 3.56E-46 | -1.54292 |
| GPD2   | 13.24944 | 12.51312 | 12.58571 | 5.546091 | 5.726716 | 4.469391 | 8.4E-46 | -1.46687 |
| DNAJC22 | 24.31088 | 27.03758 | 25.0775 | 9.446737 | 6.598421 | 8.098181 | 1.22E-45 | -1.4651 |
| PBK    | 22.74305 | 23.21787 | 24.63073 | 7.105157 | 6.832409 | 7.795319 | 2.4E-44 | -1.56518 |
| ASF1A  | 21.72884 | 20.52573 | 21.3968 | 7.110408 | 6.453619 | 7.668694 | 4.14E-44 | -1.55801 |
| MRPL18 | 50.41539 | 48.88665 | 56.32006 | 16.81074 | 13.41591 | 14.53518 | 4.67E-44 | -1.75194 |
| PALLD  | 78.29222 | 72.57678 | 69.55036 | 29.14315 | 32.87326 | 29.83082 | 5.38E-44 | -1.26629 |
| MCM8   | 11.63453 | 17.57978 | 11.53906 | 4.746821 | 4.381496 | 3.855104 | 3.14E-43 | -1.42783 |
| ATL3   | 17.23831 | 18.44042 | 18.89965 | 8.268048 | 8.725532 | 7.88878 | 6E-43 | -1.183 |
| RANBP9 | 14.68298 | 15.11321 | 13.93107 | 5.738005 | 5.625168 | 5.637755 | 1.53E-42 | -1.35186 |
| SOS1   | 32.28664 | 27.68707 | 26.3257 | 9.384988 | 16.40633 | 9.117814 | 1.95E-42 | -1.54481 |
| FNDC3A | 5.124842 | 4.857385 | 4.522923 | 1.961323 | 1.357867 | 0.966089 | 3.75E-42 | -1.89334 |
| PPAT   | 16.53039 | 14.84487 | 15.46475 | 6.710206 | 7.244393 | 5.63161 | 4.89E-42 | -1.36815 |
| MYL12A | 195.6394 | 210.6262 | 233.1606 | 66.26916 | 78.53112 | 76.48377 | 2.15E-41 | -1.51154 |
| PTBP3  | 60.6395 | 54.49788 | 59.57019 | 11.71421 | 21.42881 | 17.28635 | 5.22E-41 | -1.65078 |
| SCML1  | 8.031746 | 7.146125 | 8.068526 | 1.327005 | 1.613765 | 0.943644 | 7.07E-41 | -2.36998 |
| CHML   | 17.04749 | 15.30676 | 17.02728 | 4.039838 | 6.045872 | 3.553244 | 7.1E-41 | -1.60454 |
| TMED7  | 16.11637 | 15.27174 | 15.19069 | 6.879817 | 6.633448 | 6.431461 | 3.37E-40 | -1.2217 |
| SURF6  | 13.80975 | 13.40221 | 13.37753 | 4.475162 | 5.345902 | 5.07243 | 6.46E-40 | -1.42818 |
| Gene          | 9.074417 | 9.712737 | 9.941089 | 3.484334 | 3.48224 | 3.361411 | 6.6E-40 | -1.43059 |
|---------------|----------|----------|----------|----------|----------|----------|---------|----------|
| NUP43         | 30.69527 | 33.46264 | 31.98316 | 11.98004 | 10.79524 | 12.33501 | 1.16E-39 | -1.41196 |
| GTF2A2        | 36.58762 | 34.80914 | 34.64353 | 16.86096 | 16.74454 | 16.33723 | 3.74E-38 | -1.11371 |
| SLC12A7       | 11.8228  | 11.18577 | 11.41897 | 4.773748 | 5.122908 | 4.418197 | 7.24E-38 | -1.26018 |
| RCOR1         | 82.00807 | 87.21892 | 77.50968 | 32.54011 | 27.95286 | 32.47719 | 1.1E-37  | -1.32186 |
| CACYBP        | 26.44424 | 26.07769 | 26.048   | 13.51605 | 13.34831 | 13.27592 | 5.18E-36 | 0.96777  |
| TMED10        | 4.635037 | 5.000998 | 4.578528 | 1.76365  | 1.85054  | 1.690503 | 6.88E-35 | -1.39919 |
| APPBP2        | 5.806025 | 6.794574 | 5.776958 | 2.216131 | 2.297171 | 2.298622 | 9.61E-35 | -1.40913 |
| WDR12         | 2.742919 | 2.783887 | 2.684989 | 0.05271  | 0.06483  | 0.049082 | 1.33E-34 | -3.62083 |
| Homo_sapiens_newGene_5798 | 2.7465758 | 6.903471 | 6.042484 | 2.064974 | 2.458197 | 2.026174 | 1.7E-34  | -1.60089 |
| SLC7A1        | 29.33656 | 30.40313 | 27.24112 | 12.2805  | 12.79827 | 12.73597 | 3.49E-34 | -1.20026 |
| ACAAl1        | 10.10417 | 10.50718 | 9.627896 | 3.840884 | 2.910047 | 2.161134 | 3.99E-34 | -1.48117 |
| SMAD2         | 38.65163 | 43.25494 | 39.07102 | 15.66163 | 15.35146 | 15.89301 | 6.32E-34 | -1.27551 |
| STARD3NL      | 8.968511 | 10.28763 | 10.0518  | 3.79377  | 3.454438 | 3.541422 | 1.3E-33  | -1.41267 |
| C4orf46       | 3.719056 | 3.221918 | 4.29573  | 0.873836  | 0.952433 | 0.946263 | 1.97E-33 | -1.82948 |
| TTC5          | 82.71386 | 90.13824 | 92.93935 | 20.52705 | 29.41912 | 26.40518 | 2.72E-33 | -1.75989 |
| MRPL3         | 6.729047 | 6.244533 | 5.750834 | 1.961233 | 1.954035 | 1.342043 | 3.25E-33 | -1.77465 |
| PANK3         | 7.772473 | 6.871818 | 6.818666 | 3.053184 | 2.162007 | 1.485315 | 7.55E-33 | -1.6357 |
| NCOA7         | 15.4949  | 20.03576 | 15.27968 | 5.414983 | 5.509087 | 5.500961 | 2.72E-31 | -1.56857 |
| TMEM64        | 49.46324 | 47.77955 | 51.04465 | 24.56561 | 26.72605 | 24.81564 | 3.17E-31 | -0.95367 |
| CYP4F11       | 30.2669  | 29.43946 | 27.90813 | 10.49195 | 14.70656 | 12.81231 | 5.47E-31 | -1.32115 |
| SLC25A32      | 6.593407 | 6.348631 | 6.546616 | 1.894361 | 1.998407 | 2.14283  | 6.44E-31 | -1.63555 |
| RBM24         | 29.42695 | 27.29655 | 27.55698 | 12.28576 | 12.7581  | 13.67312 | 9.57E-31 | -1.11786 |
| SRGN          | 55.80234 | 56.15007 | 61.30757 | 21.26296 | 21.80149 | 25.23936 | 1.24E-30 | -1.32213 |
| SEMA3C        | 18.34705 | 16.60185 | 17.31725 | 5.880544 | 6.696572 | 5.512563 | 4.03E-30 | -1.34926 |
| CDCA4         | 26.79758 | 27.18217 | 27.32498 | 10.42112 | 10.92754 | 12.38699 | 6.91E-30 | -1.2441  |
| Gene      | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  | Value9  | Value10 | Value11 | Value12 | Value13 | Value14 | Value15 | Value16 | Value17 |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| OSTM1     | 8.989867| 8.851957| 9.541959| 4.065916| 3.748229| 4.058576| 8.24E-30| -1.19534|
| SUN1      | 49.75098| 53.71259| 45.38528| 20.35826| 25.3843| 23.26214| 1.2E-29 | -1.21032|
| TCEAL1    | 22.11175| 17.2901 | 17.24595| 7.70697 | 6.961827| 6.337223| 6.95E-29| -1.42974|
| ARS1      | 7.348838| 5.964859| 6.523873| 2.144513| 2.71178 | 2.470695| 6.98E-29| -1.34894|
| TMEM167A  | 14.24825| 13.66037| 14.09811| 6.998728| 6.793293| 7.189332| 7.03E-29| -1.00393|
| MTMR4     | 5.731653| 4.894519| 5.503007| 1.814869| 2.3516  | 2.264308| 8.39E-29| -1.43407|
| SHC1      | 97.12461| 93.449  | 93.09438| 45.20124 | 50.37817| 49.78532| 8.69E-29| -0.96825|
| IPO5      | 27.9596 | 28.47363| 26.69692| 14.10638 | 14.38398| 13.41899| 9.26E-29| -1.00361|
| DYNLT3    | 10.4342 | 10.10166| 10.94862| 4.210216 | 4.196458| 4.144729| 3.32E-28| -1.34973|
| KPNA3     | 10.27929| 9.922277| 9.348353| 4.544899 | 4.589352| 3.973187| 3.86E-28| -1.17499|
| CENPK     | 13.22847| 12.93681| 12.24721| 3.132801 | 4.308562| 3.244181| 4.64E-28| -1.7839 |
| GABARAPL1 | 13.41808| 14.52679| 14.08764| 5.793927 | 5.609308| 6.471405| 5.57E-28| -1.40614|
| ACER3     | 3.095125| 3.188405| 3.042457| 1.403768 | 1.295152| 1.330003| 7.14E-28| -1.3477 |
| PGM2L1    | 1.449122| 1.328896| 1.333997| 0.359239 | 0.402301| 0.31839 | 9.34E-28| -1.81856|
| KDM1B     | 5.091975| 5.305512| 5.696611| 1.218872 | 1.500253| 1.266553| 1.1E-27 | -1.91829|
| BIRC3     | 8.9765 | 8.21479 | 7.650458| 3.381236 | 2.785023| 2.58549 | 1.28E-27 | -1.45502|
| RAB18     | 13.19586| 14.13112| 13.21509| 6.624243 | 6.725588| 6.835261| 1.97E-27| -1.00172|
| CLCN4     | 1.643039| 1.654243| 1.79818 | 0.270899 | 0.4082  | 0.391356| 2.03E-27 | -2.06716|
| MTX3      | 3.591093| 3.172221| 3.249399| 1.768451 | 1.783899| 1.190344| 2.23E-27 | -1.33964|
| ASAP2     | 7.576759| 6.907536| 6.578509| 2.225885 | 2.857077| 2.336651| 3.22E-27 | -1.46804|
| CBFB      | 20.41524| 20.35312| 18.85222| 6.890871 | 7.73454 | 5.471429| 5.46E-27 | -1.48557|
| SLC11A2   | 14.8244 | 15.25956| 16.38023| 9.914783 | 7.80862 | 8.190593| 5.82E-27 | -1.03795|
| TNFRSF10A | 16.94606| 14.52407| 14.41618| 5.272395 | 6.285357| 5.085163| 7.47E-27 | -1.42607|
| IMPAD1    | 22.51526| 20.65914| 20.43617| 10.25817 | 11.39743| 9.592266| 8.99E-27 | -1.04832|
| SLC20A1   | 55.8212 | 55.07697| 54.96985| 26.87999 | 30.34899| 29.25604| 1.09E-26 | -0.96649|
| RAB3B     | 7.284594| 6.492922| 6.418174| 2.728925 | 2.768727| 2.102386| 1.36E-26 | -1.37856|
| Gene   | Value1 | Value2 | Value3 | Value4 | Value5 | Value6 | Value7 | Value8 | Value9 | Value10 | Value11 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| SOWAHC | 11.66386 | 10.6426 | 10.98314 | 5.109266 | 5.291384 | 4.482429 | 1.64E-26 | -1.15281 |
| PTAR1  | 9.108173  | 7.624466 | 7.203566 | 3.483466 | 3.665979 | 2.645468 | 1.95E-26 | -1.50601 |
| NSUN2  | 51.37794  | 49.24675 | 42.11924 | 22.89124 | 21.47856 | 21.45992 | 2.09E-26 | -1.12781 |
| TAP2   | 8.814885  | 10.11751 | 10.47754 | 3.904184 | 4.404969 | 3.982852 | 2.27E-26 | -1.23753 |
| CNOT11 | 26.12259  | 27.8333  | 28.16505 | 15.0183  | 13.74295 | 13.89682 | 2.71E-26 | -0.95636 |
| MAPK6  | 16.57918  | 15.23276 | 16.12069 | 6.584673 | 7.957207 | 6.922993 | 3.76E-26 | -1.14934 |
| ANKMY2 | 18.18636  | 16.64084 | 16.22232 | 7.816237 | 7.953649 | 7.490295 | 7.98E-26 | -1.11684 |
| PLAGL2 | 8.303217  | 7.591846 | 7.420292 | 3.508458 | 3.456738 | 2.94041  | 8.52E-26 | -1.21892 |
| STARD4 | 3.589239  | 2.979835 | 3.068562 | 1.107762 | 1.11394  | 1.075178 | 8.57E-26 | -1.75611 |
| ZNF41  | 2.742916  | 2.202939 | 2.254151 | 1.535485 | 1.015293 | 0.76850  | 1.6E-25  | -2.39096 |
| MSMO1  | 43.53156  | 43.98046 | 38.38704 | 18.03536 | 19.423   | 18.73788 | 2.57E-25 | -1.17323 |
| GFM1   | 38.90868  | 39.58482 | 35.03025 | 17.95841 | 20.1794  | 18.07922 | 5.23E-25 | -0.96913 |
| WSB2   | 93.30106  | 93.42344 | 92.7495  | 54.04521 | 54.21297 | 55.0107  | 1.43E-24 | -0.83213 |
| TPMT   | 8.385954  | 8.67761  | 7.658602 | 3.309901 | 3.5033   | 3.0776   | 1.64E-24 | -1.28529 |
| KIF21A | 22.43393  | 21.97004 | 18.93271 | 9.444958 | 10.28541 | 9.583585 | 2.6E-24  | -1.12308 |
| INSIG1 | 13.26528  | 11.65511 | 13.39876 | 4.782569 | 5.991433 | 5.656058 | 2.91E-24 | -1.2622  |
| IMPA1  | 16.84089  | 17.93502 | 17.0366  | 8.359181 | 9.349678 | 7.762737 | 3.97E-24 | -1.13871 |
| NAA20  | 113.1942  | 118.4719 | 119.4946 | 73.59705 | 62.01468 | 67.05653 | 5.67E-24 | -0.85238 |
| GABPA  | 4.36247   | 3.969309 | 4.121811 | 1.549622 | 1.769725 | 1.437508 | 6.09E-24 | -1.34322 |
| SPIN4  | 4.943042  | 5.215259 | 4.169314 | 1.483756 | 1.691591 | 1.635987 | 7.42E-24 | -1.51285 |
| G3BP1  | 59.81687  | 42.79146 | 26.5865  | 31.49876 | 18.5914  | 18.62299 | 1.14E-23 | -0.93283 |
| SPRED1 | 11.82176  | 10.05951 | 10.62419 | 5.051626 | 5.355017 | 4.274687 | 1.51E-23 | -1.15663 |
| IL1RAP | 7.838084  | 7.712685 | 6.872734 | 2.590118 | 3.4911   | 2.977892 | 2.11E-23 | -1.37833 |
| CDC27  | 23.17664  | 19.82941 | 19.15695 | 12.0795  | 13.47602 | 10.59601 | 2.21E-23 | -0.94777 |
| CCND1  | 139.1134  | 136.2727 | 138.0125 | 69.15014 | 79.29709 | 76.2469  | 2.88E-23 | -0.88449 |
| NDFIP2 | 4.752372  | 5.558014 | 4.801637 | 1.321543 | 1.438177 | 1.430486 | 2.91E-23 | -1.6517  |
| Gene   | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| PRKACB | 11.19748| 9.775894| 10.81342| 4.395522| 4.879783| 4.668973| 3.04E-23| -1.22992|
| NCL    | 278.387 | 289.7608| 275.8538| 144.8015| 172.4992| 163.2467| 3.1E-23  | -0.88704|
| BET1   | 24.36208| 26.79758| 21.02708| 7.77715 | 6.868331| 9.062654| 4.35E-23 | -1.53088|
| INPP5F | 4.714703| 4.408676| 3.810432| 2.362571| 2.024554| 1.791155| 4.35E-23 | -1.28561|
| CDIPT  | 26.87911| 31.36225| 23.46855| 6.65445 | 4.412656| 7.625311| 4.77E-23 | -1.95254|
| MTRR   | 9.881795| 9.486517| 9.642146| 4.722337| 5.218885| 4.955717| 6.01E-23 | -1.1017 |
| BAG2   | 10.10868| 10.34493| 10.65415| 5.598313| 5.205192| 5.66578 | 8.39E-23 | -0.9199 |
| UHMK1  | 24.10898| 21.93385| 20.66206| 10.33561| 11.17314| 8.904852| 1.19E-22 | -1.12184|
| ADGRG6 | 3.664738| 3.006914| 3.101842| 1.222898| 1.079796| 0.881604| 2.1E-22  | -1.61039|
| MFSD1  | 18.9713 | 26.57475| 22.33842| 8.254621| 10.08968| 9.010436| 5.34E-22 | -1.41323|
| RYK    | 14.76074| 16.95537| 16.90864| 7.341099| 8.517076| 6.805195| 6.24E-22 | -1.13356|
| SSR3   | 37.21162| 44.6404 | 43.06923| 18.10707| 19.90166| 21.83652| 7.8E-22  | -1.01395|
| RAPGEF2| 11.48605| 13.31991| 10.75643| 4.532859| 5.706817| 4.865592| 1.1E-21  | -1.23916|
| LOXL2  | 27.89292| 25.58984| 29.52561| 12.59791| 14.46004| 14.03016| 1.72E-21 | -1.03254|
| FEM1C  | 7.935014| 7.961368| 7.306895| 2.619575| 3.536672| 2.649478| 1.81E-21 | -1.35509|
| CYP24A1| 21.99578| 20.30965| 21.8947  | 12.02216| 11.02736| 11.17119| 1.83E-21 | -0.90103|
| SLC7A11| 41.54996| 36.24771| 32.96609| 14.80072| 15.72407| 10.91259| 6.24E-22 | -1.3905 |
| SCML2  | 2.574931| 2.630419| 2.117033| 0.63662 | 0.951523| 0.784737| 2.18E-21 | -1.75764|
| NOC3L  | 10.10806| 9.711715| 10.00207| 5.151358| 5.017905| 4.744949| 2.41E-21 | -1.02706|
| TMEM123 | 119.6228| 112.8223| 114.6146| 73.11109| 72.84435| 67.91801| 3.81E-21 | -0.71416|
| ATL2   | 26.27011| 29.13751| 23.48508| 11.6993 | 10.83639| 10.14523| 3.91E-21 | -1.16567|
| CPOX   | 37.30756| 36.60058| 37.27827| 22.85481| 21.34954| 20.62861| 4.05E-21 | -0.7907 |
| SREBF2 | 18.78513| 18.03993| 17.7576 | 9.65824 | 10.38486| 10.37111| 4.45E-21 | -0.84388|
| SGPL1  | 7.333767| 6.444955| 6.999157| 3.106386| 3.577725| 3.432783| 4.81E-21 | -1.13041|
| NUP58  | 7.715537| 8.040838| 7.269484| 2.317415| 3.212612| 2.764125| 5.38E-21 | -1.36547|
| KBTBD2 | 17.01362| 16.12193| 17.19275| 8.915002| 8.931198| 7.547903| 6.26E-21 | -0.99034|
| Gene   | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| FADS1  | 34.27963| 35.258  | 36.30966| 21.51343| 21.60522| 21.32516| 7.53E-21| -0.74787|
| OXR1   | 12.12461| 11.59068| 15.57219| 6.087603| 6.8465  | 8.166373| 8.29E-21| -1.12167|
| DDX3Y  | 11.07223| 9.844075| 9.864278| 4.752701| 4.768159| 4.565199| 1.09E-20| -1.13555|
| CASD1  | 6.011863| 5.546245| 5.427166| 1.599069| 2.220747| 1.926185| 1.61E-20| -1.54525|
| NDP    | 1.600342| 2.209137| 2.697861| 0.118744| 0.09664 | 0.205278| 1.62E-20| -2.77262|
| THRAP3 | 25.65501| 24.79688| 24.79598| 14.79021| 15.46089| 14.07742| 1.75E-20| -0.77122|
| MFSD9  | 7.704881| 8.531549| 8.089143| 4.775223| 4.182095| 3.928963| 2.47E-20| -1.12429|
| PTP4A2 | 45.10903| 48.41587| 49.00073| 26.00409| 25.9025  | 27.67983| 2.66E-20| -0.84863|
| MED1   | 15.06588| 14.45025| 14.60835| 5.802045| 6.548816| 5.18337 | 1.75E-20| -1.3382 |
| ARL4C  | 11.07223| 9.844075| 9.864278| 4.752701| 4.768159| 4.565199| 1.09E-20| -1.13555|
| ARPP19 | 53.71417| 50.72828| 52.94299| 37.92917| 36.89229| 34.96872| 6.01E-20| -0.71759|
| CBX5   | 22.24585| 20.16635| 19.55238| 10.91144| 11.33261| 9.506923| 6.62E-20| -1.02439|
| FECH   | 10.96567| 12.68416| 10.73422| 5.359246| 5.830276| 5.277712| 8.92E-20| -1.0577 |
| LSM14B | 23.71999| 22.83346| 22.8761  | 12.90723| 13.12476| 12.74654| 1.11E-19| -0.81495|
| STRN   | 7.928499| 7.117821| 6.968051| 3.481186| 3.914494| 3.268039| 1.92E-19| -1.02602|
| NIPA1  | 5.569887| 4.763236| 4.647272| 1.366564| 1.091767| 1.425392| 2.87E-19| -1.81114|
| KBTBD11| 2.411434| 1.909177| 2.244223| 0.701707| 0.777002| 0.556155| 3.45E-19| -1.58495|
| YWHAZ  | 655.3565 | 635.5443 | 455.2493 | 431.0689 | 414.6036 | 397.5927 | 3.87E-19 | -0.74294|
| AGFG1  | 70.55584 | 66.51491 | 59.44682 | 38.19145 | 29.81644 | 15.98317 | 4.29E-19 | -0.71384|
| DEGS1  | 42.89526 | 44.75615 | 44.76272 | 25.76421 | 27.22587 | 24.62784 | 5.27E-19 | -0.77912|
| TNPO1  | 44.15944 | 37.81254 | 37.9994  | 23.35851 | 25.55563 | 19.69523 | 5.81E-19 | -0.83618|
| EXOC6B | 5.811896 | 5.028815 | 4.801325 | 1.684841 | 2.324273 | 1.915243 | 6.51E-19 | -1.32997|
| MCL1   | 93.2441  | 86.46058 | 88.22351 | 49.39501 | 43.41928 | 40.63908 | 7.91E-19 | -0.95927|
| DYNC1L2 | 15.82476 | 15.22778 | 15.18177 | 9.052386 | 9.54248  | 8.555409 | 8.92E-19 | -0.81463|
| CCNA2  | 26.83374 | 28.99108 | 28.39015 | 16.04403 | 16.37053 | 16.5548  | 9.91E-19 | -0.78935|
| RPE    | 22.16522 | 20.95941 | 20.20835 | 11.66675 | 10.90943 | 10.43862 | 1.06E-18 | -1.01866|
| Gene     | Value1   | Value2   | Value3   | Value4   | Value5   | Value6   |
|----------|----------|----------|----------|----------|----------|----------|
| SPCS3    | 24.23807 | 24.51232 | 25.9616  | 13.68107 | 14.73635 | 14.75982 |
| CIPC     | 2.265748 | 2.502096 | 2.060084 | 0.699914 | 0.495584 | 0.653944 |
| MTMR6    | 2.766779 | 2.83773  | 2.828365 | 1.049333 | 1.27452  | 1.120099 |
| SPOPL    | 2.804689 | 3.438055 | 2.476344 | 1.241171 | 1.509421 | 1.255682 |
| CCDC6    | 14.56431 | 13.15987 | 13.03625 | 6.905591 | 7.544363 | 6.145671 |
| DUSP5    | 44.79121 | 41.96184 | 42.9837  | 21.36766 | 24.39772 | 24.60231 |
| HEATR3   | 8.537539 | 8.090407 | 8.657671 | 4.543245 | 4.447668 | 4.336493 |
| CHMP3    | 30.07757 | 31.48601 | 28.80084 | 16.24634 | 17.62192 | 17.55134 |
| GARS     | 72.08261 | 75.52407 | 70.79706 | 45.51598 | 42.47635 | 44.8303  |
| ACSL4    | 26.65087 | 23.13815 | 23.91711 | 14.95645 | 13.81764 | 13.09186 |
| ATP6V1C1 | 36.99153 | 36.6022  | 36.91336 | 34.42245 | 30.45066 | 29.6539  |
| RBM15    | 9.025878 | 7.925065 | 6.814704 | 3.427954 | 2.838424 | 2.67792  |
| WEE1     | 9.163701 | 14.56589 | 13.75213 | 3.811411 | 3.990032 | 4.376202 |
| AGO2     | 16.35505 | 13.94398 | 13.94083 | 7.056006 | 8.507078 | 6.849019 |
| ACAT2    | 21.70306 | 22.02354 | 21.87402 | 12.5341  | 12.67861 | 13.46653 |
| HIF1A    | 76.83529 | 70.47671 | 69.58522 | 36.58319 | 42.17984 | 32.97167 |
| TRIM44   | 10.83646 | 10.30052 | 9.668257 | 5.532959 | 6.2437  | 5.453698 |
| FAM136A  | 55.73652 | 56.41453 | 57.3703  | 29.79557 | 31.40548 | 34.24843 |
| LNPEP    | 3.726953 | 3.513608 | 3.300715 | 1.249776 | 1.619048 | 1.026977 |
| EI24     | 67.0332  | 73.93672 | 77.27892 | 44.81265 | 45.63562 | 46.06135 |
| FMNL2    | 10.89688 | 9.250035 | 8.716004 | 4.69085  | 4.80507 | 4.102136 |
| EEF2K    | 7.449889 | 6.452866 | 6.665805 | 3.837879 | 4.109549 | 3.618809 |
| Homo_sapiens_newGene_16497 | 4.606889 | 4.413771 | 5.969942 | 1.647341 | 1.90668 | 1.744482 |
| CPEB4    | 2.396564 | 2.606552 | 2.312761 | 0.936398 | 1.652871 | 0.832327 |
| SLC5A3   | 3.555299 | 2.952891 | 3.024264 | 1.247619 | 1.207809 | 0.791129 |
| HMGCS1   | 19.82673 | 22.19371 | 21.64977 | 11.10676 | 12.47705 | 11.36339 |
| Gene   | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  | Value9  |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| ZNF367 | 13.31506| 13.9844 | 14.7864 | 7.273821| 8.178779| 7.218453| 1.41E-16| -0.89125|
| SUCLA2 | 12.5955 | 12.12384| 11.74449| 5.375322| 5.067763| 6.009795| 1.64E-16| -1.23871|
| RPL23A | 363.8268| 388.2195| 380.262 | 231.5468| 213.1132| 239.8081| 1.8E-16  | -0.72203|
| ARL6IP6| 11.14733| 10.44345| 10.43118| 5.05542 | 4.896258| 5.757678| 1.82E-16 | -1.02605|
| RPAP1  | 7.3845  | 6.715033| 8.22637 | 4.205421| 3.633325| 1.95E-16 | -0.94312|
| F3     | 23.37973| 20.42126| 21.5886 | 6.964597| 9.847327| 9.359399| 1.97E-16 | -1.26652|
| CMAS   | 46.62217| 47.5994 | 51.13067| 25.78902| 26.81649| 28.77567| 2E-16   | -0.84691|
| RM1    | 11.37784| 9.376592| 8.97182 | 4.512714| 3.603985| 4.043521| 2.11E-16| -1.28064|
| UBA5   | 10.8663 | 11.52649| 10.9596 | 4.788308| 7.539801| 5.649494| 3.5E-16  | -1.00624|
| GBP1   | 5.965701| 5.596421| 5.70093 | 2.675035| 2.611281| 2.831291| 2.82E-16| -1.06599|
| YOD1   | 5.806047| 5.655834| 5.211443| 2.777705| 2.756347| 2.162854| 3.83E-16| -1.09146|
| ICK    | 6.324473| 6.055271| 5.772827| 3.079903| 3.212217| 2.53991 | 4.14E-16| -1.02437|
| EIF5A2 | 6.651932| 6.205779| 6.284606| 3.439471| 3.429292| 3.348607| 5.02E-16| -0.88243|
| IPO8   | 12.06407| 12.07273| 10.76796| 6.668486| 5.263856| 5.013671| 5.66E-16| -1.03897|
|        | 44082   |         |         |         |         |         |         |         |         |
| ENTPD7 | 7.332263| 6.010925| 6.540262| 2.088161| 2.943421| 2.182554| 8.44E-16| -1.39518|
| RAD51AP1| 31.42594| 23.38833| 25.75236| 13.22828| 11.07605| 14.01131| 1.02E-15| -0.97945|
| ZDHHC21| 0.631452| 0.523198| 0.490443| 0.115248| 0.130117| 0.125988| 1.17E-15| -1.86217|
| CNIH1  | 20.60832| 21.51056| 22.46148| 18.40413| 17.89039| 14.04872| 1.26E-15| -0.76527|
| SAMD5  | 8.678831| 7.626638| 8.155488| 3.559248| 4.192167| 2.914772| 1.58E-15| -1.16252|
| RDX    | 37.65006| 43.42393| 42.58406| 22.9322  | 24.81245| 20.96097 | 2.38E-15| -0.87478|
| DLGAP5 | 10.61486| 10.97102| 10.26757| 6.067578| 5.75058 | 5.200274| 2.63E-15| -0.88492|
| SORBS3 | 27.30915| 26.54208| 29.31085| 14.29817 | 11.53609| 14.32198 | 2.76E-15| -0.97968|
| BACH1  | 8.493102| 9.03717 | 7.307593| 4.426062| 4.650349| 3.658126| 3.35E-15| -1.03436|
| WDR44  | 16.3697 | 14.8689 | 15.43604| 9.057102| 9.374413| 8.154789| 3.52E-15| -0.80263|
| CKAP2  | 9.12677 | 8.741675| 9.671244| 4.823429| 4.256554| 3.643732| 3.71E-15| -1.10599|
| Gene     | Value1   | Value2   | Value3   | Value4   | Value5   | Value6   | Value7   | Value8   | Value9   |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| SQLE     | 50.98898 | 47.91178 | 44.45987 | 23.76758 | 22.7918  | 27.90547 | 4E-15    | -0.93881 |
| GFOD1    | 2.862937 | 2.481991 | 2.903987 | 1.120257 | 1.213916 | 1.591291 | 5.25E-15 | -1.04811 |
| AEN      | 37.10089 | 36.75949 | 34.90144 | 22.33849 | 23.46721 | 22.34596 | 5.35E-15 | -0.66253 |
| GNPNAT1  | 19.00389 | 20.18081 | 19.74256 | 10.55325 | 11.37053 | 11.30753 | 5.98E-15 | -0.752   |
| TMEM167B | 6.912259 | 7.039153 | 7.063794 | 3.774579 | 3.770813 | 3.147627 | 6.91E-15 | -0.96307 |
| ARMCX6   | 13.30957 | 15.34839 | 15.21913 | 7.654574 | 7.649048 | 7.283055 | 8.31E-15 | -0.94785 |
| ARNTL2   | 14.45347 | 14.68413 | 13.36949 | 6.589275 | 9.191108 | 7.866166 | 1.02E-14 | -0.96513 |
| GULP1    | 10.25835 | 11.00815 | 11.06925 | 5.060496 | 5.554861 | 5.455069 | 1.1E-14  | -0.9657  |
| IST1     | 30.52334 | 28.16011 | 23.73543 | 11.36104 | 11.61353 | 10.34614 | 1.12E-14 | -1.20657 |
| TRPM7    | 6.451991 | 6.301129 | 5.476909 | 3.006068 | 3.827423 | 2.910405 | 1.43E-14 | -0.93567 |
| PLSCR3   | 10.09458 | 9.821503 | 7.827215 | 4.654759 | 2.872148 | 3.382321 | 1.58E-14 | -1.36057 |
| CEP55    | 48.90282 | 50.01187 | 46.40598 | 25.66005 | 29.32371 | 29.54343 | 1.6E-14  | -0.7853  |
| STK38L   | 10.3976  | 9.805267 | 9.947583 | 5.739444 | 6.232678 | 5.998526 | 1.76E-14 | -0.82189 |
| HLTF     | 10.17434 | 10.43132 | 9.563752 | 5.198139 | 5.894264 | 5.564802 | 1.79E-14 | -0.88421 |
| PHTF2    | 24.89809 | 24.88267 | 21.79815 | 16.61914 | 15.77644 | 16.30132 | 2.15E-14 | -0.64873 |
| SAR1A    | 24.53507 | 23.23443 | 24.26388 | 14.12154 | 13.42295 | 15.50966 | 2.51E-14 | -0.77878 |
| NCF2     | 2.659327 | 2.470366 | 2.257126 | 0.082403 | 0.213897 | 0.517841 | 2.64E-14 | -2.28945 |
| RADX     | 6.882922 | 6.790021 | 6.377358 | 3.065615 | 3.64213 | 2.786542 | 2.92E-14 | -1.07285 |
| HK1      | 56.11864 | 52.92432 | 57.30827 | 33.854 | 37.37098 | 35.096 | 3.01E-14 | -0.66123 |
| TRAK2    | 5.135375 | 5.033579 | 5.331987 | 3.135163 | 2.987974 | 2.805375 | 3.08E-14 | -0.81915 |
| GLS      | 24.47036 | 22.85467 | 22.95781 | 14.84188 | 15.85395 | 15.11057 | 3.92E-14 | -0.62487 |
| TRIP13   | 22.13151 | 21.91917 | 23.27708 | 11.54863 | 13.2258 | 13.34422 | 4.48E-14 | -0.81948 |
| INIP     | 7.211404 | 9.517282 | 8.85678 | 4.194379 | 4.26897 | 4.087782 | 4.55E-14 | -0.87402 |
| MEST     | 16.10456 | 16.04321 | 16.18165 | 9.827129 | 10.08613 | 9.373134 | 4.92E-14 | -0.73266 |
| PRKAG2   | 9.131658 | 9.316425 | 10.79351 | 4.72394 | 5.639905 | 5.834415 | 5E-14    | -0.95598 |
| TOMM20   | 67.20547 | 70.59664 | 70.43481 | 47.55357 | 44.8702 | 46.65873 | 5.77E-14 | -0.59544 |
| Gene      | Value1   | Value2   | Value3   | Value4   | Value5   | Value6   | Value7   | Value8  |
|-----------|----------|----------|----------|----------|----------|----------|----------|--------|
| TMEM184C  | 17.63875 | 16.93259 | 17.22371 | 11.35374 | 10.59925 | 9.813076 | 5.85E-14 | -0.71496 |
| MIGA1     | 6.713398 | 6.627362 | 5.250706 | 2.90705  | 3.60607  | 2.680474 | 7.15E-14 | -1.0635 |
| PRKAA1    | 11.41797 | 11.50502 | 10.78999 | 5.974282 | 6.751081 | 5.146386 | 7.25E-14 | -0.94067 |
| TMEM65    | 7.18335  | 6.725716 | 7.016698 | 4.422152 | 4.410115 | 3.973945 | 7.73E-14 | -0.71612 |
| NR1D2     | 16.77191 | 17.13018 | 15.50977 | 9.719325 | 10.71407 | 9.618622 | 7.81E-14 | -0.72988 |
| DENND6A   | 7.417016 | 6.177359 | 6.32716  | 4.426109 | 4.148103 | 3.657603 | 8.58E-14 | -0.86062 |
| DNAJB1    | 65.06618 | 65.5985  | 67.3208  | 45.03189 | 44.42218 | 40.6795  | 8.6E-14  | -0.6166 |
| GTPBP2    | 7.119647 | 6.819847 | 7.090555 | 3.270126 | 3.181738 | 4.079252 | 1.04E-13 | -1.0432 |
| RAB2B     | 3.09146  | 3.115138 | 2.570623 | 1.059878 | 0.865841 | 0.999733 | 1.09E-13 | -1.4035 |
| GTF2A1    | 8.254318 | 7.514576 | 8.195298 | 4.602631 | 5.044914 | 4.673919 | 1.16E-13 | -0.73887 |
| RUFY2     | 6.389568 | 5.752575 | 4.930779 | 2.72725  | 2.59066  | 2.642966 | 1.2E-13  | -1.09442 |
| HMGN3     | 20.03348 | 20.77726 | 23.48129 | 10.0173  | 9.754955 | 10.88128 | 1.64E-13 | -1.04024 |
| FRS2      | 9.501539 | 11.44444 | 10.09513 | 3.880956 | 5.12377  | 3.854337 | 1.68E-13 | -1.06981 |
| OTUD4     | 16.95606 | 14.13736 | 13.42535 | 7.362926 | 8.642451 | 6.55514  | 2.3E-13  | -1.0068 |
| GNG12     | 17.41603 | 17.56238 | 17.15998 | 10.71003 | 11.71763 | 10.48114 | 2.6E-13  | -0.6733 |
| MTMR9     | 3.299303 | 2.465097 | 2.455044 | 1.276433 | 1.176106 | 1.150483 | 3.51E-13 | -1.06559 |
| CHFR      | 18.7826  | 19.49096 | 19.60222 | 10.58693 | 11.87202 | 11.72118 | 3.64E-13 | -0.7814 |
| MAN2A1    | 14.76396 | 11.96924 | 12.72323 | 6.696976 | 6.803632 | 5.083696 | 3.79E-13 | -1.05819 |
| CLOCK     | 6.615948 | 5.483184 | 4.833722 | 2.385078 | 3.126217 | 2.501648 | 4.16E-13 | -1.13711 |
| HSD17B4   | 16.88602 | 15.8896  | 21.17297 | 10.17075 | 9.876658 | 9.435896 | 4.17E-13 | -0.73575 |
| HPK3      | 13.34142 | 11.80737 | 11.55838 | 7.041966 | 6.978996 | 5.557452 | 6.53E-13 | -0.90181 |
| FAM126B   | 2.430783 | 1.823126 | 1.620177 | 0.590078 | 0.771707 | 0.452125 | 7.52E-13 | -1.45367 |
| SNX16     | 3.386069 | 3.133492 | 2.911372 | 1.156682 | 1.149191 | 1.415915 | 8.79E-13 | -1.41346 |
| ADIPOR1   | 42.93837 | 44.29485 | 43.983   | 27.92338 | 29.16892 | 24.77856 | 9.01E-13 | -0.69033 |
| CHMP2B    | 70.58084 | 79.33971 | 81.57708 | 43.51065 | 51.02797 | 46.96428 | 9.11E-13 | -0.84026 |
| ERCC6L    | 7.951437 | 7.058427 | 6.666328 | 3.848551 | 4.10389  | 3.535043 | 9.38E-13 | -0.90204 |
| Gene  | Value 1 | Value 2 | Value 3 | Value 4 | Value 5 | Standard Deviation |
|-------|---------|---------|---------|---------|---------|--------------------|
| GCC2  | 6.393803| 6.38629 | 6.41249 | 3.950153| 4.439037| 3.525884           |
| RAB1A | 71.59407 | 69.76597 | 60.20862 | 45.59993 | 39.68786 | 48.74541           |
| CISD1 | 13.52626 | 13.60797 | 13.7572 | 8.045673 | 7.037371 | 8.107063           |
| RC3H2 | 14.26861 | 12.18252 | 8.282001 | 7.521554 | 7.132274 | 6.498641           |
| PANX2 | 4.877983 | 5.569793 | 5.695592 | 2.378375 | 2.128975 | 2.49254            |
| RAB27A| 6.222607 | 6.211638 | 6.840766 | 3.455708 | 3.27017  | 3.216854           |
| THAP5 | 12.7885  | 11.88544 | 10.82448 | 5.898362 | 5.848984 | 5.643667           |
| MAPRE3| 20.9217  | 20.96057 | 17.01007 | 9.456418 | 9.105046 | 10.45798           |
| XPO1  | 67.01318 | 63.49806 | 56.67646 | 35.87082 | 37.27725 | 33.98922           |
| KLHL5 | 33.12888 | 28.15199 | 26.7409  | 20.53925 | 17.97177 | 16.34656           |
| PLCXD2| 4.330872 | 4.271847 | 3.498971 | 1.523661 | 2.044582 | 1.742864           |
| GBA2  | 19.67119 | 18.83308 | 18.91991 | 13.40644 | 12.98385 | 11.85359           |
| PARD6B| 13.65076 | 12.40973 | 12.91102 | 7.848026 | 7.994533 | 7.421515           |
| ERO1A | 9.687148 | 9.703666 | 10.06329 | 8.016826 | 8.603018 | 7.196596           |
| SMC2  | 10.7746  | 10.85374 | 10.56068 | 6.216256 | 6.803939 | 5.450583           |
| PTCH1 | 4.079058 | 5.085064 | 3.851122 | 1.79288  | 2.836701 | 1.598213           |
| SHCBP1| 24.27875 | 24.90097 | 24.6174  | 15.97412 | 17.01171 | 16.23468           |
| MRPS17| 17.70673 | 17.07312 | 17.47656 | 10.24392 | 9.477661 | 10.78488           |
| RAB27B| 13.82501 | 12.81213 | 12.90891 | 8.748221 | 8.180927 | 7.219507           |
| RGPD6 | 4.56442  | 4.625857 | 4.639326 | 2.559291 | 2.290737 | 2.077101           |
| SGPP1 | 5.917478 | 4.490981 | 4.576412 | 2.256473 | 2.288659 | 2.099186           |
| CCSAP | 3.393229 | 3.419591 | 3.428414 | 1.859235 | 1.954253 | 1.738079           |
| KLHL23| 1.805701 | 1.593877 | 2.144243 | 0.800727 | 0.626572 | 0.531481           |
| C1GALT1C1| 13.27914 | 14.84317 | 14.09754 | 7.947792 | 7.349044 | 8.003788           |
| MFSD6 | 2.824887 | 2.650981 | 2.614496 | 0.914518 | 1.276509 | 0.842706           |
| LSM11 | 1.81191  | 1.578429 | 1.813332 | 0.782836 | 0.807308 | 0.819006           |
| Gene        | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  | Value9  | Value10 | Value11 |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| CDC6        | 29.83413| 31.82767| 31.91443| 18.73549| 17.67968| 19.97907| 9.96E-12| -0.72248|
| RAB11FIP2   | 4.167715| 3.49985 | 3.417639| 1.328316| 1.906521| 1.386859| 1.06E-11| -1.19533|
| SLC19A2     | 6.59315 | 6.360991| 6.001145| 3.488715| 3.868033| 2.773787| 1.14E-11| -0.94232|
| FGF2        | 6.237356| 5.874445| 5.047178| 2.929284| 3.282708| 2.602343| 1.16E-11| -0.99639|
| ANAPC16     | 12.75846| 13.59927| 12.71404| 8.093117| 8.182948| 8.367302| 1.18E-11| -0.67454|
| SNX24       | 4.836359| 3.693586| 4.650316| 1.625248| 1.665535| 2.799391| 1.22E-11| -1.44879|
| C12orf4     | 10.56824| 9.739733| 9.667588| 4.55724 | 5.624994| 5.765092| 1.34E-11| -0.84236|
| RGPD8       | 3.550859| 3.360179| 2.837991| 1.33243 | 2.0163  | 1.134494| 1.45E-11| -1.04745|
| RCAN1       | 15.23863| 14.5758 | 11.92251| 6.893516| 7.25179 | 7.339698| 1.47E-11| -0.91049|
| VDR         | 6.041012| 5.696419| 5.161799| 1.573372| 2.795959| 2.328482| 1.55E-11| -1.096  |
| SMIM13      | 4.481725| 4.329517| 4.18933 | 2.422983| 1.883112| 1.708157| 1.56E-11| -1.07222|
| ELMSAN1     | 11.35328| 10.95906| 9.904436| 6.12056 | 6.660741| 5.559598| 1.67E-11| -0.73689|
| BHLHB9      | 3.238935| 3.374683| 3.254836| 1.457981| 1.669095| 1.699145| 1.69E-11| -0.99856|
| ARHGGEF10   | 5.844513| 5.180374| 5.917323| 2.860811| 3.330633| 3.346007| 1.76E-11| -0.84145|
| EPHA2       | 51.71989| 43.66747| 45.67346| 25.91855| 30.17494| 27.87429| 1.88E-11| -0.74939|
| NUP188      | 27.89024| 24.43793| 23.55746| 14.10058| 16.27403| 14.77255| 1.99E-11| -0.75016|
| CARD19      | 27.28097| 29.8809 | 30.76416| 8.580099| 7.175841| 13.18709| 1.99E-11| -1.3363 |
| FAM198B     | 13.11818| 12.59412| 12.71541| 7.56751 | 7.884911| 6.057211| 2.02E-11| -0.81633|
| ZCCHC10     | 7.039029| 7.596799| 5.98032 | 3.477768| 2.188537| 1.602965| 2.19E-11| -1.48661|
| TAPI        | 7.339839| 7.420756| 8.056802| 4.046252| 4.239741| 4.447639| 2.58E-11| -0.83347|
| PURB        | 9.025339| 8.475496| 8.374699| 5.30374 | 5.690684| 5.743305| 2.8E-11  | -0.63697|
| HAT1        | 48.84898| 51.39066| 51.34627| 31.38014| 26.89838| 32.32214| 3.07E-11| -0.74307|
| SEC24D      | 8.494981| 8.432493| 8.77424 | 4.176253| 5.342668| 4.501257| 3.51E-11| -0.86265|
| PYURF       | 55.43224| 57.90345| 56.39559| 38.54265| 33.66727| 36.63901| 4.12E-11| -0.64876|
| ZDHHC17     | 6.180944| 4.898178| 5.125258| 3.379234| 3.880966| 3.13892 | 4.71E-11| -0.80717|
| PREP        | 11.12373| 10.71946| 11.40913| 6.379931| 4.632369| 7.93417 | 4.85E-11| -1.02162|
| Gene              | Homo_sapiens_newGene_4925 | Homo_sapiens_newGene_16135 | SNRPD3       | APOL6        | PFN2         | ZBTB33       | AP4E1        | RBPMS2       | GNA13        | Homo_sapiens_newGene_4925 | Homo_sapiens_newGene_16135 |
|-------------------|---------------------------|----------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------------|---------------------------|
|                   | 3.138613                  | 6.288061                   | 48.87669      | 2.651716     | 73.77328     | 14.00491     | 3.003888     | 7.342079     | 58.82754     | 3.138613                  | 6.288061                   |
|                   | 2.478959                  | 61.16106                   | 65.19426      | 2.415776     | 77.11352     | 11.99122     | 2.473489     | 9.843316     | 54.98437     | 2.478959                  | 61.16106                   |
|                   | 2.131828                  | 58.61087                   | 62.83256      | 2.323042     | 76.01695     | 10.9872      | 2.375972     | 8.378478     | 53.40198     | 2.131828                  | 58.61087                   |
|                   | 0.83472                   | 35.68161                   | 31.76618      | 1.245072     | 46.2541      | 7.092353     | 1.86534      | 2.372323     | 34.64964     | 0.83472                   | 35.68161                   |
|                   | 0.382604                  | 42.2288                    | 28.05584      | 1.43622      | 50.946       | 7.292213     | 1.89987      | 3.0366       | 39.01143     | 0.382604                  | 42.2288                    |
|                   | 0.26454                   | 39.26199                   | 31.33653      | 1.087921     | 48.48445     | 6.770395     | 1.095606     | 3.781612     | 32.8903      | 0.26454                   | 39.26199                   |
|                   | 0.978755                  | 7.36E-11                   | 5.64E-11      | 5.38E-11     | 5.38E-11     | 5.28E-11     | 5.38E-11     | 5.38E-11     | 5.58E-11     | 5.36E-11                   | 7.36E-11                   |
|                   | 3.21309                   | 7.26E-11                   | 6.65E-11      | 5.87E-11     | 5.87E-11     | 5.87E-11     | 5.87E-11     | 5.87E-11     | 5.87E-11     | 6.65E-11                   | 7.26E-11                   |
|                   | 0.919537                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 3.119537                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
|                   | 0.94E-11                  | 7.33E-11                   | 0.94E-11      | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11     | 0.94E-11                   | 0.94E-11                   |
| Gene   | Value1   | Value2   | Value3   | Value4   | Value5   | Value6   |
|--------|----------|----------|----------|----------|----------|----------|
| RAD1   | 8.49785  | 6.400993 | 6.200901 | 6.628508 | 6.260266 | 2.230433 |
| CLIC4  | 21.99539 | 21.27961 | 22.0923  | 14.59685 | 14.05015 | 11.77424 |
| LPIN1  | 2.245588 | 1.925706 | 1.852425 | 0.908318 | 1.058488 | 1.018367 |
| LLRC59 | 102.5718 | 106.0634 | 109.4681 | 62.66976 | 70.57056 | 73.32314 |
| RGPD5  | 3.759609 | 4.224288 | 3.983339 | 2.73006  | 1.595774 | 2.309284 |
| SLC43A3| 5.906282 | 6.229545 | 5.462065 | 1.972729 | 2.382826 | 2.993865 |
| ANLN   | 72.66121 | 65.90334 | 66.9992  | 44.94278 | 46.1034  | 39.53627 |
| AREL1  | 6.879568 | 6.630849 | 7.190785 | 3.418638 | 4.030425 | 3.267234 |
| ZSCAN25| 14.23848 | 10.63966 | 11.11799 | 7.431986 | 8.149695 | 7.941595 |
| MPST   | 23.90412 | 29.52179 | 27.96863 | 12.99731 | 7.816951 | 12.28224 |
| CYTH4  | 3.175506 | 1.989826 | 2.498714 | 0.84998  | 0.910229 | 0.969657 |
| DPY19L4| 11.40593 | 9.526063 | 11.5193  | 7.494471 | 6.207951 | 4.385621 |
| FAM3C  | 28.07145 | 27.02363 | 25.31987 | 14.17328 | 15.52677 | 17.54748 |
| UBA3H3B| 28.90571 | 26.30843 | 27.22947 | 14.22931 | 18.46521 | 15.8695  |
| SLC16A6| 4.38271  | 3.504933 | 3.206278 | 1.757175 | 1.773936 | 1.905121 |
| CCNH   | 17.31402 | 15.36931 | 14.78209 | 8.753974 | 9.586015 | 9.94904  |
| RASSF8 | 5.197741 | 4.419874 | 6.315344 | 2.992074 | 2.923313 | 4.106702 |
| LEPROT1| 12.42852 | 11.64056 | 12.1491  | 8.564748 | 7.601353 | 8.041526 |
| NFU1   | 17.92232 | 18.45881 | 20.62011 | 6.487596 | 8.394645 | 10.2107  |
| PIK3C2A| 15.5336  | 13.49208 | 12.83607 | 7.723339 | 8.0109   | 5.570572 |
| MPV17  | 28.11762 | 32.3186  | 32.47694 | 15.80627 | 12.58889 | 16.81756 |
| HAUS6  | 4.986204 | 4.604542 | 4.11638  | 2.216249 | 2.731826 | 2.015705 |
| ABT1   | 10.26331 | 10.27898 | 10.18031 | 6.334494 | 6.166654 | 6.732177 |
| EOOGT  | 6.046958 | 4.926733 | 5.867849 | 3.008654 | 3.317833 | 2.620379 |
| SLC25A30| 1.642449 | 1.590182 | 1.40967  | 0.586483 | 0.482519 | 0.388027 |
| C5orf51| 5.316044 | 4.885446 | 5.009355 | 3.140126 | 2.843904 | 2.398362 |
| Gene   | 44085  | 1.22729 | 1.13082 | 0.85343 | 1.05184 | 0.80757 | 1.17779 | 0.868784 | -0.8126 |
|--------|--------|---------|---------|---------|---------|---------|---------|-----------|--------|
| RAB8B  | 6.531288 | 8.295492 | 6.705046 | 3.300155 | 4.259683 | 5.091741 | 7.5E-10 | -0.89225 |
| DUSP2  | 5.366708 | 6.601095 | 7.20129 | 2.966496 | 2.28502 | 2.726433 | 8.15E-10 | -1.17779 |
| CYP51A1| 35.09091 | 34.02932 | 31.38301 | 18.85356 | 22.67843 | 21.2554 | 8.85E-10 | -0.651484 |
| CHST11 | 8.718656 | 8.429015 | 8.22692 | 4.195742 | 5.767102 | 4.820464 | 8.65E-10 | -0.80757 |
| SMAD5  | 7.001749 | 10.59787 | 5.276434 | 3.516596 | 3.513333 | 2.293811 | 9.23E-10 | -1.05184 |
| SGK3   | 1.855036 | 1.873548 | 1.893181 | 0.910724 | 0.850084 | 0.816029 | 9.5E-10 | -1.14973 |
| PLS1   | 44.87174 | 36.8241 | 33.86551 | 25.24786 | 33.80709 | 22.22182 | 9.97E-10 | -0.67654 |
| Homo_sapiens_newGene_4442 | 1.195289 | 0.923825 | 0.898452 | 0.441748 | 0.357161 | 0.289897 | 1.01E-09 | -1.33115 |
| RNFT1  | 5.008274 | 4.432368 | 5.421854 | 2.079328 | 2.261719 | 2.19144 | 1.06E-09 | -1.20582 |
| RPS6KA3| 19.93001 | 19.18748 | 18.48315 | 13.11337 | 14.36972 | 16.41514 | 1.09E-09 | -0.73985 |
| MICB   | 9.683811 | 8.953062 | 8.072781 | 4.940791 | 5.292447 | 4.851388 | 1.13E-09 | -0.81407 |
| TRAF5  | 4.160428 | 4.066768 | 3.604469 | 1.787209 | 2.260621 | 1.939911 | 1.16E-09 | -0.95184 |
| SELENOT| 39.58638 | 24.745 | 23.87453 | 22.37345 | 13.3873 | 14.50108 | 1.23E-09 | -0.95162 |
| RAB23  | 3.911829 | 4.248953 | 4.018784 | 2.842623 | 2.513815 | 2.252886 | 1.33E-09 | -0.76394 |
| PLEKHA3| 18.62842 | 17.12943 | 17.41408 | 9.394447 | 8.930441 | 8.731203 | 1.33E-09 | -1.35115 |
| PIK3R3 | 2.587276 | 2.124303 | 1.690822 | 1.305056 | 1.640206 | 1.232692 | 1.62E-09 | -0.70303 |
| EBP    | 1.842302 | 1.995384 | 2.012308 | 1.683037 | 0.953905 | 0.79516 | 1.81E-09 | -0.9839 |
| PLOD2  | 59.45148 | 58.21781 | 56.70958 | 30.7049 | 38.14616 | 49.9541 | 1.98E-09 | -0.76054 |
| AK3    | 74.22201 | 67.54207 | 74.24063 | 39.58079 | 52.5668 | 45.41496 | 2.37E-09 | -0.66493 |
| FOXN2  | 5.1118 | 4.107674 | 5.358437 | 1.693084 | 2.467514 | 1.965162 | 2.75E-09 | -1.13082 |
| KLHL2  | 7.192623 | 6.466347 | 6.008573 | 3.617443 | 4.353521 | 3.167091 | 3E-09 | -0.85343 |
| CCNG1  | 8.330121 | 6.254451 | 6.672258 | 3.960738 | 3.91429 | 3.7719 | 3.43E-09 | -0.86367 |
| PLSCR4 | 14.87387 | 23.51591 | 22.82989 | 8.501652 | 6.502466 | 10.12061 | 3.91E-09 | -1.22729 |
| DUSP6  | 1.630323 | 2.415274 | 1.789239 | 0.387722 | 0.895193 | 0.361014 | 4.67E-09 | -1.62052 |
| NT5DC3 | 23.6085 | 20.64878 | 22.96007 | 21.34382 | 15.23633 | 16.75689 | 5.06E-09 | -0.62811 |
| Gene   | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| ACKR3  | 36.87105| 37.95029| 36.67825| 13.44824| 20.8354 | 20.69069| 5.29E-09| -0.97815|
| SLC39A8| 2.616396| 2.786258| 2.704596| 1.024824| 1.396602| 1.140935| 5.31E-09| -1.10245|
| SH2B3  | 19.8396 | 17.8255 | 17.6292 | 10.23231| 12.58278| 10.70078| 5.33E-09| -0.71027|
| JAG1   | 77.62176| 68.72722| 71.97927| 44.29493| 52.40308| 42.99747| 5.5E-09 | -0.64109|
| GSPT1  | 102.14  | 47.32067| 52.57575| 29.77623| 32.71471| 22.4762 | 5.94E-09 | -0.62829|
| MYBL1  | 7.670222| 5.868893| 5.127059| 3.139787| 3.196681| 2.974603| 6.02E-09| -1.15696|
| AKIRIN1 | 21.72487| 20.8689 | 21.00577| 12.09222| 11.95219| 8.161904| 6.46E-09| -0.90369|
| DCUN1D1| 6.283023| 6.043633| 6.32288 | 4.236383| 4.846825| 7.300312| 6.66E-09| -0.59778|
| NUP153 | 20.93873| 17.55902| 17.27495| 10.81096| 11.83247| 8.62629 | 6.77E-09| -0.83061|
| SPRTN  | 6.174165| 6.259628| 6.341007| 3.739565| 4.096248| 3.839907| 6.95E-09| -0.6861 |
| SSH2   | 11.81766| 11.90409| 11.40928| 11.3101  | 11.66577| 7.08E-09| -0.67848|
| DNAJC24| 3.704049| 3.159374| 3.05521 | 1.941409| 2.222412| 1.351298| 8.47E-09| -1.09538|
| AKNA   | 11.62933| 10.66697| 9.302357| 6.551438| 6.285542| 5.280402| 9.38E-09| -0.59595|
| LSM5   | 14.97052| 15.29382| 15.36079| 9.736553| 9.319748| 8.18E-08| -0.6181 |
| VPS13C | 8.816837| 8.60556 | 8.44732 | 4.97009 | 4.917571| 5.30036 | 1.16E-08| -0.73563|
| KRAS   | 1.438135| 1.24167 | 1.12987 | 0.59231 | 0.591527| 0.585337| 1.17E-08| -1.0972 |
| RFK    | 14.97052| 15.29382| 15.36079| 9.736553| 9.319748| 8.18E-08| -0.6181 |
| SLC37A1| 8.413612| 8.596269| 9.186411| 4.64811 | 5.715517| 6.366717| 1.21E-08| -0.71721|
| SNX13  | 6.973898| 5.970138| 6.498463| 4.357006| 4.666211| 4.561711| 1.23E-08| -0.63972|
| NHLRC2 | 3.357125| 2.971671| 2.781974| 1.858569| 1.946528| 1.778848| 1.32E-08| -0.70431|
| MCTS1  | 4.858996| 57.63082| 53.95218| 32.51991 | 27.64231| 34.16933| 1.32E-08| -0.75578|
| STAM2  | 4.841128| 4.460336| 4.582228| 2.995722| 3.047707| 2.90159 | 1.38E-08| -0.6376 |
| GTF2E1 | 8.638707| 9.044168| 8.577883| 5.499206| 5.82032 | 5.234557| 1.64E-08| -0.64266|
| PRKCI  | 13.37829| 12.46668| 12.45304| 8.870935| 8.30972 | 7.081921| 1.68E-08| -0.66187|
| Gene      | LIF     | GPATCH11 | SLC25A33 | SLC39A10 | CACNB3 | E2F2 | NAB1 | GNE      | RASSF6 | XPO4 | PDK1 | CDCP1 | CDC7     | CDKAL1 | ITGA2 | AP1G1   | EXTL3 | TLR4 | ZNF106 | KATNAL1 | CMC1 | CDKN3 | AKT3 | ACOX2 | CLN8 | N6AMT1 |
|-----------|---------|----------|----------|----------|--------|------|------|----------|--------|------|------|-------|----------|---------|-------|---------|--------|------|--------|------|-------|------|--------|
|           | 8.750734| 9.604715 | 6.751038 | 8.893613 | 10.66505| 4.228106| 11.03896| 19.00715 | 2.861672| 2.779401| 3.45566| 2.284791 | 7.434969| 3.036783| 11.63314| 11.85162| 7.638021| 2.167057| 5.367668| 1.779561| 12.39647| 33.98914| 0.67059| 0.80541| 8.421257| 2.904657 |
|           | 8.070372| 9.970986 | 6.825573 | 9.075126 | 9.66505 | 3.947171 | 10.77618| 19.28079 | 3.554666| 2.779082| 3.345892 | 2.204998 | 1.330575 | 3.501205 | 11.41369 | 15.45554 | 6.743568 | 1.914316 | 5.128021 | 1.39428 | 15.04097 | 35.16254 | 0.588865 | 0.816521 | 7.703117 | 4.175813 |
| Gene     | Value   | Value   | Value   | Value   | Value   | Value   | Value   | Value   |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| RPS6KA5  | 0.162859| 0.125876| 0.316106| 0.194261| 0.030752| 0.121479| 6.14E-08| -1.52846|
| ZMAT3    | 3.173801| 2.970487| 2.350965| 0.906848| 1.40111 | 0.728117| 6.14E-08| -1.30439|
| PHF6     | 18.13407| 18.3066 | 17.34105| 12.67562| 12.5163 | 11.28932| 6.16E-08| -0.60114|
| PRKCH    | 0.570709| 0.40451 | 0.764762| 0.101352| 0.049875| 0.161173| 6.59E-08| -1.82514|
| ADAMTS1  | 2.722146| 2.607849| 2.341195| 1.029481| 1.349089| 0.914464| 6.62E-08| -1.17698|
| CLCN5    | 4.116919| 4.466888| 4.398046| 1.898159| 2.309375| 1.654666| 7.8E-08  | -0.94419|
| MMD      | 13.67338| 13.78937| 15.63424| 10.69242| 8.63008 | 8.741108| 8.35E-08| -0.61894|
| CHKA     | 28.62913| 32.34533| 31.89088| 22.15233| 21.01592| 20.39203| 9.18E-08| -0.71728|
| POLR2M   | 6.677891| 6.432548| 6.978505| 4.730066| 4.606255| 4.26341 | 1.12E-07| -0.62665|
| TANGO2   | 13.88004| 16.02649| 15.57923| 9.782885| 5.642712| 7.453827| 1.16E-07| -0.9867 |
| NXT2     | 7.771702| 7.713079| 9.207983| 4.144367| 4.675056| 5.190834| 1.17E-07| -0.78131|
| THBS1    | 54.27384| 45.95338| 44.96297| 29.11533| 34.34945| 26.96359| 1.21E-07| -0.66104|
| GNPTAB   | 7.301964| 7.234548| 6.356992| 4.527867| 5.091915| 4.773515| 1.23E-07| -0.62431|
| ZNF740   | 6.134509| 5.096099| 5.470755| 3.654089| 3.76404 | 3.517242| 1.23E-07| -0.61483|
| SHOC2    | 9.032475| 9.041368| 8.152577| 6.07666 | 4.946543| 4.710787| 1.26E-07| -0.72575|
| TXNDC16  | 1.569643| 0.816624| 1.07897 | 0.255509| 0.163775| 0.339527| 1.34E-07| -1.5047 |
| PLEKHB2  | 25.90655| 24.71373| 23.08337| 16.03837| 15.72134| 13.56735| 1.36E-07| -0.65093|
| FOX3     | 8.740203| 7.737643| 7.466384| 5.348148| 4.601373| 2.238152| 1.41E-07| -1.12126|
| CCNE1    | 13.52983| 12.8402 | 11.98877| 7.745707| 6.632103| 7.168484| 1.46E-07| -0.7479 |
| CNNM3    | 7.233498| 6.648169| 6.357797| 4.18103 | 4.517895| 4.082765| 1.52E-07| -0.66174|
| ADAMTS12 | 9.162875| 7.843975| 9.612967| 4.911541| 5.415758| 8.769975 | 1.64E-07| -0.77679|
| SAMD9L   | 4.4761 | 4.417044| 4.052305| 1.374483| 2.779688| 1.54842 | 1.72E-07| -1.07088|
| CSF2     | 4.162037| 2.957087| 3.743353| 0.533932| 0.718849| 1.18978 | 2E-07    | -1.60233|
| PHF5A    | 18.41731| 22.69574| 21.40085| 12.37548| 10.56727| 12.79777| 2.12E-07| -0.78686|
| MYD88    | 8.922725| 22.80884| 16.00481| 7.720352| 9.856077| 5.138662| 2.52E-07| -1.1547 |
| EREG     | 37.94881| 32.85989| 32.31736| 19.30501| 24.6478 | 19.05936 | 2.54E-07| -0.70489|
| Gene                      | Value1 | Value2 | Value3 | Value4 | Value5 | Value6 | Value7 | Value8 | Value9 | Value10 |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| FAM45A                   | 9.831961 | 11.89525 | 10.35659 | 6.189843 | 5.461279 | 6.087736 | 2.55E-07 | -0.75508 |
| GJB3                     | 3.831028 | 3.160616 | 4.497537 | 1.561588 | 1.971153 | 1.622298 | 2.57E-07 | -1.08043 |
| GNPDA2                   | 6.634644 | 6.14784 | 7.700007 | 2.129417 | 3.0495 | 2.055516 | 2.58E-07 | -1.06849 |
| PURA                     | 1.300963 | 1.281956 | 1.268147 | 0.849913 | 0.7139 | 0.712024 | 2.64E-07 | -0.74629 |
| HINT3                    | 7.513506 | 6.903093 | 8.066645 | 4.126766 | 4.66653 | 4.868912 | 2.83E-07 | -0.70985 |
| TAF9B                    | 22.9314 | 23.22648 | 20.38127 | 13.50989 | 16.04524 | 13.79787 | 2.84E-07 | -0.62124 |
| MTLN                     | 9.366121 | 10.17164 | 12.15302 | 3.018504 | 3.502387 | 4.684615 | 2.99E-07 | -1.30552 |
| MAP2K1                   | 14.90139 | 13.25637 | 15.32635 | 9.700137 | 8.737886 | 9.990098 | 3.07E-07 | -0.61056 |
| SGCE                     | 30.06618 | 32.2019 | 29.39883 | 21.01873 | 17.04353 | 21.62961 | 3.07E-07 | -0.64147 |
| PAQR3                    | 5.383681 | 6.347871 | 5.170033 | 3.379609 | 3.844701 | 3.850048 | 3.2E-07 | -0.60277 |
| NBPF1                    | 11.44851 | 11.1708 | 10.51385 | 6.781472 | 8.163083 | 6.531359 | 3.26E-07 | -0.62845 |
| KCTD9                    | 14.67655 | 15.09944 | 14.1584 | 8.678709 | 10.62218 | 8.955538 | 3.33E-07 | -0.63122 |
| CD109                    | 23.28436 | 20.82414 | 18.78643 | 12.83142 | 14.67053 | 11.06558 | 3.35E-07 | -0.70052 |
| GPR63                    | 0.446926 | 0.399193 | 0.403512 | 0.055522 | 0.137104 | 0.092831 | 3.59E-07 | -1.58381 |
| CHAC2                    | 11.33979 | 13.13126 | 13.83018 | 7.349502 | 7.861984 | 7.473604 | 3.9E-07 | -0.74307 |
| MTO1                     | 4.186256 | 3.156824 | 4.07586 | 1.800636 | 1.383352 | 1.375936 | 3.92E-07 | -0.6568 |
| Homo_sapiens_newGene_8824 | 4.914978 | 5.083949 | 6.156433 | 2.251354 | 3.394024 | 3.056903 | 3.97E-07 | -0.75783 |
| TMEM209                  | 11.03024 | 9.827477 | 9.955591 | 7.534494 | 7.113181 | 5.815192 | 3.97E-07 | -0.61104 |
| NXPE3                    | 10.66264 | 11.03469 | 10.43356 | 7.496312 | 7.85387 | 6.09273 | 4.01E-07 | -0.59498 |
| Homo_sapiens_newGene_15905 | 15.70266 | 13.50813 | 14.72127 | 8.052309 | 9.477821 | 7.704727 | 4.32E-07 | -0.89992 |
| NFKB1                    | 15.76284 | 14.79301 | 14.82543 | 10.35347 | 11.44336 | 9.813779 | 4.57E-07 | -0.5901 |
| STK4                     | 11.98185 | 9.670863 | 9.402933 | 5.447261 | 7.516917 | 4.593569 | 5.15E-07 | -0.80557 |
| PRKCE                    | 4.093276 | 3.008569 | 3.117667 | 3.624609 | 4.111583 | 3.044822 | 5.41E-07 | -0.85482 |
| RBM12B                   | 8.453647 | 10.26311 | 9.480205 | 6.334516 | 6.002987 | 6.560266 | 5.67E-07 | -0.63883 |
| MEGF6                    | 10.16289 | 8.425575 | 9.700062 | 6.250656 | 6.068682 | 7.270393 | 5.77E-07 | -0.63046 |
| NR2C2                    | 11.46684 | 10.21922 | 11.01233 | 7.545329 | 7.164199 | 4.834906 | 5.98E-07 | -0.76647 |
| Gene   | Value 1  | Value 2  | Value 3  | Value 4  | Value 5  | Value 6  | Value 7  | Value 8  | Value 9  |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| VPS54  | 9.585845| 10.20425| 9.393446| 6.139178| 6.730785| 4.522032| 6.44E-07| -0.73781|
| MMACHC | 1.484899| 1.238706| 1.383442| 0.756545| 0.501015| 0.584312| 7.07E-07| -1.05779|
| LEPROT | 7.085268| 8.253179| 7.514245| 5.026296| 5.187923| 3.933614| 7.41E-07| -0.71251|
| HSPA14 | 6.215364| 6.871466| 6.40956  | 3.439809| 4.556717| 3.68962  | 7.51E-07| -0.74715|
| TARBP1 | 5.50581 | 5.632321| 5.089588| 3.734124| 3.687425| 3.182854| 8.56E-07| -0.61551|
| PKDCC  | 8.428137| 9.748361| 9.794673| 5.936878| 6.121266| 5.980016| 9.79E-07| -0.63158|
| TFEC   | 1.196926| 0.866007| 0.868371| 0.35647 | 0.406819| 0.294531| 9.86E-07| -1.15884|
| FMR1   | 13.68557 | 14.0785 | 11.94142 | 9.176918| 8.607093| 8.575409| 1.02E-06| -0.69241|
| SMIM10L1| 5.741904| 6.028619| 5.971978| 3.650151| 3.641346| 4.230752| 1.04E-06| -0.62119|
| SNRNP200| 51.00565 | 44.41552 | 44.23484 | 30.85512| 34.4765  | 27.00001 | 1.05E-06| -0.6007 |
| C21orf91| 0.916681 | 0.902297| 0.936668| 0.30071 | 0.370188| 0.631757| 1.1E-06  | -1.13968|
| RFX7   | 2.881485| 2.907574| 2.346861| 1.253465| 1.716533| 1.019081| 1.11E-06| -0.95641|
| ANKRD13C| 9.122205| 8.744542| 7.704031| 5.246443| 5.882224| 5.727045| 1.12E-06| -0.59971|
| IFNLR1 | 4.249788| 3.303122| 3.340047| 1.968265| 1.946938| 2.273115| 1.12E-06| -0.75914|
| PARG   | 6.926411| 5.707673| 5.837011| 4.185904| 3.363598| 2.560903| 1.15E-06| -0.77713|
| IFI16  | 18.62326| 15.72028| 14.57762 | 12.16556| 10.1831 | 9.923886| 1.27E-06| -0.58566|
| NUAK1  | 5.362793| 4.459359| 4.179868| 2.994116| 3.213965| 2.68655 | 1.42E-06| -0.69106|
| FBLIM1 | 42.81343 | 38.03413 | 27.94021 | 17.42113 | 21.68514 | 16.29387 | 1.45E-06 | -0.93593|
| SCOC   | 15.52026 | 15.86084 | 17.22104 | 11.60534 | 10.01823 | 11.15952 | 1.49E-06 | -0.58734|
| MOSPD2 | 2.660584| 2.778441| 2.895431| 1.690031| 0.991522| 1.078099| 1.54E-06| -0.88243|
| TMEM170B| 0.140407| 0.211358| 0.246235| 0.020406| 0.048807| 0.019823| 1.6E-06 | -1.65748|
| CDKN1A | 37.47391 | 41.19334 | 40.24906 | 18.63858 | 10.97194 | 22.86386 | 1.63E-06 | -1.09078|
| SIRT1  | 7.202048| 6.248649| 7.742095| 4.440461| 4.646708| 4.542672| 1.69E-06| -0.63182|
| MICA   | 12.61371 | 15.42779 | 13.7317 | 9.463308 | 8.596439 | 9.78775 | 1.7E-06 | -0.63109|
| KBTBD8 | 1.721732| 1.12859 | 1.298727 | 0.790954 | 0.854797 | 1.01416 | 1.73E-06 | -1.45009|
| MBLAC2 | 1.040259| 1.2048 | 0.870225 | 0.354124 | 0.580186 | 0.303585 | 1.82E-06 | -1.28446|
| Gene          | Value1 | Value2 | Value3 | Value4 | Value5 | Value6 | p-value  |
|--------------|--------|--------|--------|--------|--------|--------|----------|
| RNF2         | 10.14679 | 9.462961 | 9.778449 | 5.148902 | 7.323887 | 7.198584 | 1.98E-06 | -0.61638 |
| PDZD8        | 10.0613 | 8.666489 | 8.875453 | 6.567632 | 6.121122 | 4.950451 | 1.99E-06 | -0.64456 |
| ORMDL1       | 15.8281 | 20.98814 | 21.81534 | 12.43166 | 11.8035 | 11.43515 | 2.4E-06 | -0.73202 |
| CAPN7        | 14.1112 | 12.14193 | 13.85358 | 10.01432 | 9.042862 | 7.211285 | 2.41E-06 | -0.64446 |
| FAM214B      | 7.282105 | 3.916576 | 6.887179 | 2.398178 | 2.201944 | 2.736978 | 2.51E-06 | -1.05777 |
| STYK1        | 3.465897 | 5.185616 | 4.069313 | 1.388607 | 1.92615 | 1.76353 | 2.55E-06 | -0.96005 |
| MSH2         | 22.91405 | 24.17934 | 20.98814 | 12.43166 | 11.8035 | 11.43515 | 2.55E-06 | -0.5918  |
| Homo_sapiens_newGene_19628 | 8.062128 | 9.016675 | 9.016402 | 5.329724 | 5.711824 | 5.901639 | 2.56E-06 | -0.60933 |
| PRSS23       | 105.376 | 106.9665 | 53.63103 | 26.54605 | 24.52118 | 23.64111 | 2.57E-06 | -1.58641 |
| VPS37C       | 13.43029 | 11.18688 | 11.01361 | 8.183329 | 7.629319 | 7.752896 | 2.74E-06 | -0.60522 |
| HSPA4L       | 3.395056 | 3.002157 | 3.340195 | 2.318032 | 2.242106 | 1.93345 | 2.82E-06 | -0.58886 |
| C10orf88     | 2.8416 | 2.739298 | 2.711339 | 1.527241 | 1.555954 | 1.285901 | 2.84E-06 | -0.87664 |
| TMED5        | 26.57946 | 19.18457 | 25.51244 | 17.02798 | 16.43363 | 15.7829 | 2.93E-06 | -0.67382 |
| PARPBP       | 10.21827 | 10.17502 | 6.434793 | 3.836311 | 5.377029 | 3.812187 | 2.96E-06 | -0.95861 |
| ZFAND1       | 23.2906 | 18.15287 | 22.37938 | 14.63964 | 15.58595 | 13.56393 | 3E-06   | -0.67056 |
| GM2A         | 6.948194 | 7.22762 | 6.509035 | 4.214588 | 3.896831 | 4.823338 | 3.03E-06 | -0.64754 |
| ANXA3        | 12.39595 | 14.72752 | 11.66592 | 6.251152 | 7.346245 | 8.228148 | 3.03E-06 | -0.79428 |
| GLIPR1       | 25.50912 | 25.3842 | 21.05506 | 9.572038 | 13.37435 | 13.16532 | 3.18E-06 | -0.74787 |
| LGR4         | 21.07696 | 18.98124 | 19.15499 | 13.14914 | 6.755781 | 9.670446 | 3.27E-06 | -0.93867 |
| PCDHB6       | 2.617905 | 3.28878 | 2.821635 | 1.548066 | 1.673115 | 1.470203 | 3.29E-06 | -0.84097 |
| C12orf29     | 25.53444 | 33.57689 | 31.53741 | 20.94862 | 24.92577 | 25.16939 | 3.31E-06 | -0.59064 |
| ELF2         | 7.83706 | 6.690193 | 6.43191 | 2.801804 | 4.388967 | 3.816587 | 3.71E-06 | -0.88976 |
| SMAP2        | 10.87778 | 9.617873 | 12.19715 | 6.500119 | 7.101263 | 7.236336 | 3.99E-06 | -0.64415 |
| CLDND1       | 22.4621 | 21.7212 | 24.19016 | 13.82283 | 14.07143 | 12.38589 | 4.18E-06 | -0.63852 |
| SEC11A       | 40.53966 | 46.11952 | 41.5657 | 23.33262 | 33.16394 | 22.53218 | 4.28E-06 | -0.69794 |
| PTBP2        | 3.117279 | 3.656828 | 2.259649 | 0.754564 | 0.667669 | 0.613493 | 4.55E-06 | -1.13461 |
| Gene Name          | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  |
|-------------------|--------|--------|--------|--------|--------|--------|--------|
| CLDN2             | 11.6865| 10.7809| 13.1713| 8.57201| 7.23171| 6.97920| 4.8E-06|
| B3GALT5           | 5.457934| 4.844935| 4.762276| 2.75071| 3.671277| 2.76868| 5.03E-06|
| TRIM23            | 1.986217| 2.007234| 2.51064| 1.067224| 1.399767| 0.935757| 5.5E-06|
| RCOR3             | 13.01282| 9.282194| 11.51961| 8.338077| 9.620973| 7.961753| 5.68E-06|
| BMP2K             | 4.819869| 4.558577| 4.688273| 2.549698| 3.639615| 2.484993| 5.84E-06|
| HSD17B7           | 6.48611| 6.265319| 5.459189| 3.36751| 2.927751| 3.419616| 5.9E-06|
| HECTD1            | 10.89251| 12.46659| 11.51961| 8.338077| 9.620973| 7.961753| 5.68E-06|
| SAMD4A            | 4.336813| 3.796455| 3.615644| 2.272518| 1.399767| 0.935757| 5.68E-06|
| TMTC4             | 1.450458| 1.397594| 1.316477| 0.704621| 0.535795| 0.594686| 6.9E-06|
| JADE1             | 7.274846| 6.242167| 6.740386| 3.977529| 4.91485| 3.558123| 7.27E-06|
| Homo_sapiens_newGene_16208 | 3.518017| 3.081655| 2.772133| 1.705005| 2.428523| 1.510896| 7.34E-06|
| PARP12            | 8.65571| 8.905799| 8.310686| 4.93299| 5.728525| 6.44303| 7.9E-06|
| BTBD7             | 5.94494| 6.008066| 4.692883| 3.939357| 4.474501| 4.108951| 8.6E-06|
| SERPINB9          | 2.385211| 2.466167| 2.37946| 1.451812| 1.47007| 1.506894| 9.48E-06|
| MOB1B             | 4.018845| 3.007016| 2.873105| 1.966816| 2.116881| 2.133583| 9.63E-06|
| APIS2             | 6.579173| 7.67026| 6.175859| 4.191779| 5.076483| 4.251195| 9.85E-06|
| JAZF1             | 3.482534| 2.819633| 3.292113| 1.981764| 1.422855| 1.763464| 1E-05|
| HMG2A             | 53.54275| 46.82759| 37.68269| 20.63979| 32.109| 27.14536| 1.02E-05|
| MMP1              | 8.022429| 9.048779| 8.591561| 6.069894| 5.192417| 5.102455| 1.02E-05|
| BRIP1             | 5.202629| 4.61297| 4.17186| 2.428893| 3.282541| 2.033482| 1.02E-05|
| FYCO1             | 4.098398| 4.645455| 4.381827| 3.131026| 2.76524| 2.46802| 1.06E-05|
| LRRC8B            | 2.730061| 2.547804| 2.677654| 1.45421| 1.944654| 1.668722| 1.06E-05|
| AMPD3             | 9.139956| 10.56486| 7.210524| 5.869171| 5.94961| 4.410438| 1.07E-05|
| KRIT1             | 10.61038| 10.61264| 8.001034| 2.815825| 3.972217| 3.599584| 1.09E-05|
| FAM174B           | 8.315361| 7.421566| 8.676318| 5.095992| 5.252469| 6.004533| 1.18E-05|
| GLMN              | 5.615041| 5.663918| 5.040708| 2.07448| 2.320844| 3.428343| 1.22E-05|
| Protein | Value 1 | Value 2 | Value 3 | Value 4 | Value 5 | Value 6 |
|---------|---------|---------|---------|---------|---------|---------|
| RUFY3   | 10.33901 | 9.446926 | 9.946834 | 7.000274 | 6.083643 | 7.613704 |
| PLAUR   | 23.74264 | 23.04948 | 23.52314 | 12.33597 | 14.21225 | 18.60441 |
| BRWD3   | 2.755342 | 2.482335 | 2.315043 | 1.636261 | 1.713157 | 1.225569 |
| KDR     | 3.931452 | 3.75319  | 3.817787 | 1.683737 | 2.703847 | 1.846872 |
| ARL15   | 0.954526 | 0.989972 | 1.257923 | 0.787398 | 0.37344  | 0.38498  |
| WDR7    | 1.758074 | 1.301153 | 1.618922 | 0.401435 | 0.860446 | 0.635992 |
| GCOM1   | 1.059266 | 0.646807 | 0.98377  | 0.286569 | 0.259801 | 0.964204 |
| KSLH4   | 7.542326 | 7.721651 | 7.540153 | 3.933893 | 5.700908 | 4.49838  |
| STC2    | 17.90388 | 18.00385 | 17.20269 | 8.990715 | 13.07792 | 11.61922 |
| GID4    | 5.045911 | 6.223976 | 5.870878 | 4.052565 | 3.861823 | 3.861823 |
| ZIC2    | 2.779116 | 2.85501  | 2.652352 | 1.561013 | 1.745203 | 1.58196  |
| ZDHHC23 | 2.300509 | 1.562199 | 2.114913 | 1.007925 | 1.022859 | 1.101254 |
| DDX3X   | 115.4731 | 60.01699 | 101.5731 | 48.21988 | 49.62802 | 49.56242 |
| OLFM2   | 7.877043 | 7.94923  | 6.761544 | 4.1616   | 4.791705 | 1.7E-05  |
| GPR180  | 1.50471 | 1.345118 | 1.536858 | 1.000832 | 0.838812 | 0.737157 |
| CAMKK1  | 10.87685 | 9.71429  | 9.601073 | 5.393031 | 7.032992 | 6.892794 |
| ZBTB41  | 4.66561  | 4.074577 | 4.272697 | 2.842557 | 3.142236 | 2.256246 |
| SUSD6   | 2.602264 | 2.704648 | 2.994721 | 1.782134 | 1.871919 | 1.476972 |
| GAS2L3  | 4.031784 | 3.399017 | 4.16899  | 2.043322 | 2.530951 | 1.959726 |
| NIN     | 3.916449 | 3.833026 | 3.610151 | 2.29546  | 2.920322 | 2.289078 |
| SPATA5  | 1.621001 | 1.327852 | 1.26244  | 0.868949 | 0.827166 | 0.785313 |
| ZNF488  | 2.131472 | 2.421535 | 2.32102  | 1.418073 | 1.294756 | 1.291821 |
| TPK1    | 2.512079 | 1.716285 | 2.136225 | 0.986953 | 1.791791 | 1.218047 |
| CSNK2A1 | 14.7067  | 15.78415 | 28.67501 | 12.54353 | 10.1087  | 7.523177 |
| RNF19A  | 9.510724 | 9.298426 | 8.414932 | 5.437108 | 6.564069 | 4.950738 |
| CABYR   | 14.81404 | 16.03434 | 13.55306 | 9.797982 | 9.478358 | 10.1084  |
| Gene                        | Homo_sapiens_newGene_2494 | Homo_sapiens_newGene_3857 | CENPQ | COL4A2 | LGR5 | FIGN | LIPG | SLC25A20 | TRIM35 | SECISBP2L | KRTAP2-3 | B4GAT1 | KCTD6   | ERCC4 | ASB4    | FGD6   | ARID3B   | TRIM35 | SLC25A20 | LIPG | COL4A2 | CENPQ | CLIC3 | Homo_sapiens_newGene_3857 | Homo_sapiens_newGene_16827 | PEX3 | DUSP9 | MAP3K7 | SEC14L1 |
|-----------------------------|---------------------------|---------------------------|-------|-------|------|------|------|---------|--------|-----------|----------|--------|---------|--------|---------|--------|---------|--------|--------|---------|---------|------------------|------------------|------|------|-------|--------|
|                            | 2.900005                  | 2.110137                  | 2.924113 | 1.097869 | 1.06177 | 0.722403 | 3.01E-05 | -1.09875 | 28.53556 | 26.29008 | 26.95053 | 15.44237 | 17.84815 | 20.24649 | 3.11E-05 | -0.60415 | 4.692706 | 4.720672 | 3.686655 | 2.91899 | 2.835557 | 2.354319 | 3.21E-05 | -0.65022 | 7.489851 | 6.60453 | 6.529711 | 4.308767 | 4.130068 | 4.752057 | 3.24E-05 | -0.60579 | 8.632206 | 6.839279 | 7.563092 | 1.867151 | 3.690796 | 3.734411 | 3.41E-05 | -1.11025 | 5.718373 | 5.547373 | 5.76782 | 3.926909 | 3.295611 | 3.608076 | 3.45E-05 | -0.64121 | 5.206977 | 4.22617 | 5.428839 | 2.516645 | 3.097547 | 2.75461 | 3.49E-05 | -0.78956 | 3.624141 | 3.199724 | 3.332967 | 2.119269 | 2.523968 | 2.045465 | 3.6E-05 | -0.5937 | 3.663327 | 3.186885 | 2.734283 | 1.169434 | 1.817135 | 1.742018 | 3.64E-05 | -0.79655 | 7.043692 | 7.244057 | 5.813357 | 4.644799 | 4.630703 | 3.46129 | 3.68E-05 | -0.63745 | 2.72771 | 2.212015 | 2.113979 | 1.370993 | 1.456475 | 1.26384 | 3.92E-05 | -0.75182 | 7.647156 | 8.307081 | 8.040123 | 5.162715 | 6.127264 | 5.373466 | 4.01E-05 | -0.6048 | 7.832706 | 7.803111 | 8.130949 | 4.279636 | 5.430205 | 5.071965 | 4.03E-05 | -0.69104 | 2.382795 | 1.842811 | 2.111398 | 0.235501 | 1.103549 | 1.412701 | 4.15E-05 | -1.12523 | 1.475553 | 1.787454 | 1.454854 | 1.362905 | 0.987784 | 0.769194 | 4.29E-05 | -0.74408 | 3.394567 | 4.515885 | 3.865254 | 1.470004 | 0.83151 | 1.747239 | 4.42E-05 | -1.22079 | 1.295128 | 1.249352 | 1.740802 | 0.928446 | 0.702335 | 0.679071 | 4.57E-05 | -0.83892 | 1.380778 | 1.551264 | 1.516291 | 0.997355 | 0.929731 | 1.003984 | 4.98E-05 | -0.68096 | 6.69797 | 7.547703 | 6.547004 | 4.201548 | 4.807887 | 3.971128 | 5.1E-05 | -0.6619 | 5.89292 | 5.550517 | 6.990193 | 2.652058 | 2.462161 | 3.704369 | 5.41E-05 | -0.95157 | 2.610745 | 2.230065 | 1.537798 | 1.33241 | 1.101145 | 0.949401 | 5.46E-05 | -0.91128 | 1.568212 | 2.00547 | 2.239282 | 0.386649 | 0.856684 | 0.903358 | 5.47E-05 | -1.17179 | 11.46666 | 15.17072 | 11.15147 | 6.826303 | 8.962378 | 7.988989 | 5.67E-05 | -0.62674 | 3.685347 | 3.513433 | 3.563032 | 1.704494 | 2.061512 | 2.339001 | 6.09E-05 | -0.7705 | 10.14609 | 7.406905 | 10.70256 | 5.483682 | 5.978009 | 5.338677 | 6.29E-05 | -0.69228 | 42.35573 | 36.98973 | 38.36213 | 15.34432 | 26.44474 | 21.36891 | 6.73E-05 | -0.86026 |
| Gene                      | Value 1 | Value 2 | Value 3 | Value 4 | Value 5 | Value 6 |
|---------------------------|---------|---------|---------|---------|---------|---------|
| ABHD13                    | 1.150842| 1.383621| 1.22431 | 0.797174| 0.63463 | 0.580651| 6.75E-05 | -0.83891 |
| SPRYD7                    | 5.774659| 5.637672| 6.236777| 2.908293| 3.903572| 3.971723| 7.24E-05 | -0.68597 |
| FAM234B                   | 2.442026| 2.516822| 2.045604| 1.531344| 1.422674| 1.418603| 7.47E-05 | -0.66092 |
| KIAA0586                  | 3.244228| 3.910432| 4.301388| 3.225243| 2.293912| 1.989661| 7.5E-05  | -0.6484 |
| Homo_sapiens_newGene_9227 | 14.73351| 16.40599| 18.99164| 10.09584| 9.240817| 9.151646| 7.7E-05  | -0.77152 |
| HOOK1                     | 0.472009| 0.408474| 0.512041| 0.216626| 0.173443| 0.116361| 8.01E-05 | -1.1673 |
| Homo_sapiens_newGene_15489| 0.769745| 0.786453| 1.215192| 0.156261| 0.140074| 0.235932| 8.06E-05 | -1.4105 |
| CCNE2                     | 9.47261 | 8.884505| 7.388038| 4.097821| 6.161351| 5.539341| 8.78E-05 | -0.6248 |
| ME2                       | 17.08845| 10.3742 | 18.75435 | 4.010609| 5.96088 | 4.166261| 8.93E-05 | -0.7302 |
| Homo_sapiens_newGene_8846 | 1.842427| 1.291785| 1.684608| 0.924407| 0.843488| 0.929217| 9.19E-05 | -0.7876 |
| HIPK2                     | 28.12949| 26.68002| 24.40971| 17.98368| 20.04389| 12.97896| 9.43E-05 | -0.6232 |
| TMEM168                   | 5.158591| 7.082632| 7.864803| 3.718307| 3.317253| 2.891897| 9.76E-05 | -0.8109 |
| BNIP2                     | 4.596211| 4.611108| 10.21917| 3.79807 | 2.861847| 3.341101| 0.000106| -0.6851 |
| XK                        | 0.419635| 0.380683| 0.300515| 0.141588| 0.112646| 0.115866| 0.000106| -1.1269 |
| MTIF3                     | 7.986232| 9.869259| 9.142763| 5.650946| 5.280592| 5.45449 | 0.000113| -0.6566 |
| MINDY2                    | 1.176176| 1.185715| 1.233188| 0.623322| 0.695934| 0.332369| 0.000113| -1.0830 |
| TMEM182                   | 3.984185| 5.266492| 3.577687| 2.821687| 2.140055| 2.245176| 0.000118| -0.6536 |
| IRAK4                     | 7.07284 | 4.756589| 7.701523| 6.773022| 5.044531| 5.156716| 0.000122| -0.6503 |
| Homo_sapiens_newGene_12702| 2.490626| 2.422151| 2.562981| 1.659913| 1.630069| 1.497931| 0.000123| -0.6318 |
| Homo_sapiens_newGene_12578| 1.082623| 1.155349| 1.000053| 0.508154| 1.122951| 0.361008| 0.000128| -1.0979 |
| CMTM4                     | 9.863272| 7.382687| 7.619529| 5.889945| 5.295698| 5.459092| 0.000131| -0.6032 |
| PIKFYVE                   | 3.915636| 3.747665| 3.047715| 2.413212| 2.47364 | 2.093407| 0.000132| -0.7982 |
| CFL2                      | 34.86176| 39.03884 | 18.2021 | 9.572545| 12.192  | 24.12473 | 0.000133| -0.8936 |
| Homo_sapiens_newGene_8453 | 1.740656| 1.876195| 2.115223| 0.735472| 0.961425| 0.650807| 0.000151| -0.9809 |
| Homo_sapiens_newGene_17275| 3.015354| 3.251053| 3.966307| 1.854574| 2.006478| 2.529689| 0.00016 | -0.7904 |
| SACS                      | 3.783437| 2.986347| 2.72967 | 1.787416| 2.32779 | 1.576892| 0.000168| -0.6977 |
| Gene Name                  | 2.650801 | 2.278139 | 2.29191 | 1.185607 | 1.582042 | 0.705333 | 0.000173 | -0.93956 |
|---------------------------|----------|----------|---------|----------|----------|----------|----------|----------|
| MEF2C                     |          |          |         |          |          |          |          |          |
| USF3                      | 2.225349 | 2.243524 | 1.824861| 1.649411 | 1.281118 | 0.801102 | 0.000186 | -0.75757 |
| KLHDC2                    | 11.2983  | 11.21371 | 10.98415| 2.335485 | 8.489676 | 7.031697 | 0.00019  | -0.62752 |
| LAMC2                     | 11.74904 | 10.04461 | 10.74729| 5.310519 | 7.858552 | 7.406005 | 0.000194 | -0.64407 |
| CYR61                     | 13.12535 | 12.05594 | 11.90386| 5.241487 | 8.778604 | 7.675845 | 0.000203 | -0.73233 |
| SYTL5                     | 1.606234 | 2.002085 | 1.570138| 1.124733 | 0.667916 | 0.864291 | 0.000203 | -0.87384 |
| Homo_sapiens_newGene_9169 | 1.44163  | 1.4218   | 1.066474| 0.764055 | 0.649401 | 0.816273 | 0.000223 | -0.81182 |
| MPZL3                     | 0.955378 | 1.067411 | 1.029527| 0.455692 | 0.40456  | 0.224234 | 0.000225 | -1.05362 |
| SMPD2                     | 9.131996 | 10.01033 | 10.41222 | 6.980497 | 5.234353 | 6.21538  | 0.00023  | -0.63453 |
| COPS7A                    | 46.64922 | 51.94595 | 27.08964| 23.36959 | 22.80231 | 25.80391 | 0.000243 | -0.78066 |
| FGF5                      | 0.243745 | 0.21879  | 0.222803| 0.049676 | 0.056889 | 0.021113 | 0.000245 | -1.33526 |
| WDR41                     | 4.789701 | 6.105491 | 6.213394| 3.981853 | 3.561652 | 4.312072 | 0.000288 | -0.68236 |
| FAM200B                   | 3.79686  | 4.048278 | 3.948369| 2.374556 | 2.45505  | 2.476976 | 0.000303 | -0.64799 |
| MANSC1                    | 4.953033 | 3.999381 | 3.39915 | 3.427642 | 2.183911 | 2.231094 | 0.000303 | -0.79424 |
| LMCD1                     | 34.75598 | 37.50883 | 37.67125 | 8.937755 | 31.76779 | 31.72223 | 0.000309 | -0.64544 |
| GPR160                    | 1.547512 | 1.834101 | 1.631194| 0.825895 | 0.713501 | 0.894741 | 0.000313 | -0.9146  |
| Homo_sapiens_newGene_100  | 5.025861 | 4.527966 | 4.431538| 2.626101 | 3.906426 | 2.736674 | 0.00033  | -0.74289 |
| IL7R                      | 5.037349 | 4.020629 | 3.54413 | 2.563111 | 2.87876  | 3.006989 | 0.000331 | -0.67372 |
| SPDEF                     | 5.002212 | 4.943944 | 5.467262 | 3.645264 | 2.926568 | 3.291391 | 0.000336 | -0.62606 |
| SKIL                      | 11.36568 | 8.516377 | 9.554148 | 4.899399 | 5.357357 | 7.316911 | 0.000337 | -0.73323 |
| LYSMD2                    | 4.563041 | 4.072227 | 3.280002 | 2.323344 | 1.786528 | 2.361111 | 0.000342 | -0.80652 |
| PRKAG1                    | 25.19664 | 27.21557 | 26.31018 | 15.19201 | 22.04372 | 14.98691 | 0.000361 | -0.60281 |
| GPR137C                   | 0.707722 | 0.618554 | 0.624312 | 0.368619 | 0.185802 | 0.193885 | 0.000388 | -1.08859 |
| MDM1                      | 3.290866 | 3.544907 | 3.114458 | 2.707729 | 2.181855 | 2.091358 | 0.000412 | -0.62945 |
| Homo_sapiens_newGene_18542| 3.710249 | 3.364962 | 4.609682 | 1.471527 | 1.461339 | 2.427213 | 0.000416 | -0.97568 |
| CDV3                      | 43.52198 | 78.35367 | 76.90977 | 24.10394 | 31.0022  | 33.84092 | 0.000421 | -1.12165 |
| Gene Name                        | Homo_sapiens_newGene_16980 | Homo_sapiens_newGene_11399 | Homo_sapiens_newGene_19903 | Homo_sapiens_newGene_13226 | Homo_sapiens_newGene_17135 | Homo_sapiens_newGene_14051 |
|---------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| P2RY1                           | 2.598484                    | 2.243752                    | 2.902936                    | 1.580193                    | 2.757204                    | 2.818861                    |
| CACNA1I                         | 0.213603                    | 0.20612                     | 8.893772                    | 4.979819                    | 4.940364                    | 4.989395                    |
| RB1                             | 1.966343                    | 2.243752                    | 2.902936                    | 4.781693                    | 2.940364                    | 2.591156                    |
| CLCN3                           | 12.53655                    | 12.54383                    | 12.53655                    | 12.54383                    | 12.53655                    | 12.54383                    |
| DIPK1A                          | 5.57204                     | 5.57204                     | 5.57204                     | 5.57204                     | 5.57204                     | 5.57204                     |
| CMPK1                           | 47.92205                    | 47.92205                    | 47.92205                    | 47.92205                    | 47.92205                    | 47.92205                    |
| COPS8                           | 7.545383                    | 7.545383                    | 7.545383                    | 7.545383                    | 7.545383                    | 7.545383                    |
| TAF5                            | 2.13839                     | 2.13839                     | 2.13839                     | 2.13839                     | 2.13839                     | 2.13839                     |
| MB21D2                          | 4.979819                    | 4.979819                    | 4.979819                    | 4.979819                    | 4.979819                    | 4.979819                    |
| ZFYV1                           | 3.395071                    | 3.395071                    | 3.395071                    | 3.395071                    | 3.395071                    | 3.395071                    |
| TP53INP1                        | 1.580193                    | 1.580193                    | 1.580193                    | 1.580193                    | 1.580193                    | 1.580193                    |
| NFKB2                          | 2.940364                    | 2.940364                    | 2.940364                    | 2.940364                    | 2.940364                    | 2.940364                    |
| ASB9                            | 4.698311                    | 4.698311                    | 4.698311                    | 4.698311                    | 4.698311                    | 4.698311                    |
| RAB28                           | 7.413746                    | 7.413746                    | 7.413746                    | 7.413746                    | 7.413746                    | 7.413746                    |
| Homo_sapiens_newGene_14051      | 2.818861                    | 2.818861                    | 2.818861                    | 2.818861                    | 2.818861                    | 2.818861                    |
| COX11                           | 42.37619                    | 42.37619                    | 42.37619                    | 42.37619                    | 42.37619                    | 42.37619                    |

**Note:** The table above lists gene names and their corresponding expression levels.
| Genes                |        |        |         |         |         |         |         |         |
|----------------------|--------|--------|---------|---------|---------|---------|---------|---------|
| CHIC1                | 9.076178 | 7.532756 | 7.867629 | 5.58692 | 3.602416 | 4.487496 | 0.000814 | -0.8187 |
| SLC10A7              | 2.028228 | 2.594711 | 2.684783 | 1.926923 | 1.068753 | 0.794431 | 0.000816 | -0.80107 |
| HMGCR                | 16.5069  | 14.09296 | 14.77233 | 9.021549 | 12.55303 | 8.919785 | 0.000821 | -0.5992 |
| PFKFB4               | 2.384261 | 1.845467 | 1.351516 | 1.029897  | 0.361395 | 0.696658 | 0.000917 | -1.0378 |
| MFSD2A               | 3.817554 | 2.929864 | 3.360341 | 1.68604  | 1.029897 | 0.696658 | 0.000952 | -0.708  |
| C16orf87             | 5.763619 | 5.380885 | 6.387978 | 3.710232 | 4.266215 | 4.332073 | 0.000985 | -0.61751|
| FMN2                 | 0.911106 | 0.815386 | 0.75463  | 0.54991  | 0.361395 | 0.696658 | 0.000986 | -0.84205|
| BEND6                | 2.324583 | 2.39842  | 2.061242 | 1.78402  | 1.78402  | 1.295409 | 0.001013 | -0.69409|
| PARP9                | 4.547189 | 4.66651  | 4.807304 | 3.17813  | 3.146272 | 2.258354 | 0.001135 | -0.66544|
| YIPF5                | 10.32119 | 10.78678 | 10.74981 | 7.099135 | 6.712959 | 3.594267 | 0.001187 | -0.77776|
| ARL6                 | 1.385421 | 1.371893 | 1.139938 | 0.840975 | 0.625606 | 0.924565 | 0.001206 | -0.73101|
| TLDC2                | 2.951453 | 3.018793 | 3.348482 | 1.303669 | 1.755096 | 2.129372 | 0.001334 | -0.77734|
| Homo_sapiens_newGene_18157 | 1.943382 | 1.432361 | 1.629166 | 0.88483  | 1.140884 | 0.254102 | 0.001349 | -1.14196|
| HSPB6                | 1.213359 | 1.239312 | 0.609235 | 0.151158 | 0.414451 | 0.208195 | 0.001361 | -1.18719|
| Homo_sapiens_newGene_16414 | 1.686787 | 1.541676 | 1.843067 | 0.959412 | 1.14256  | 0.806888 | 0.001367 | -0.79989|
| ZBTB20               | 6.947205 | 5.080212 | 4.261765 | 4.063944 | 4.121516 | 2.776556 | 0.001377 | -0.64861|
| FAM241B              | 3.330268 | 4.464322 | 5.020137 | 2.399425 | 1.697807 | 2.398626 | 0.001543 | -0.84506|
| DIXDC1               | 1.63589  | 1.365879 | 1.255851 | 0.933585 | 0.757004 | 0.708385 | 0.001577 | -0.63878|
| FUT11                | 2.711235 | 3.241327 | 2.647483 | 1.647815 | 1.948699 | 1.623464 | 0.001624 | -0.6763 |
| ASB3                 | 4.958206 | 5.978518 | 4.001578 | 3.178694 | 2.862237 | 3.46213  | 0.001632 | -0.6471 |
| CACNA2D4             | 0.667358 | 0.824113 | 0.843103 | 0.409167 | 0.425396 | 0.21056  | 0.001744 | -0.8835 |
| POMK                 | 5.378973 | 2.879235 | 2.754001 | 1.197846 | 2.036263 | 0.731901 | 0.001762 | -1.06081|
| F8A3                 | 1.644137 | 4.331861 | 2.716994 | 1.492515 | 0.276116 | 0.481419 | 0.001863 | -1.15918|
| TLR6                 | 3.584819 | 4.208206 | 2.922797 | 2.446754 | 2.012676 | 1.393408 | 0.001873 | -0.99276|
| DDHD2                | 4.378878 | 4.145189 | 4.069481 | 2.811997 | 2.739038 | 2.878735 | 0.001925 | -0.61843|

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| Gene                  | Fold Change 1 | Fold Change 2 | Fold Change 3 | Fold Change 4 | Fold Change 5 | Fold Change 6 | Fold Change 7 | Fold Change 8 | Fold Change 9 | Fold Change 10 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| MECP2                 | 20.40112      | 16.93138      | 10.31343      | 12.5604       | 28.66882      | 17.37929      | 0.002083      | -0.62645      |               |                |
| ERAP2                 | 4.461188      | 3.684026      | 4.752633      | 3.172047      | 3.627136      | 3.610182      | 0.002169      | -0.64178      |               |                |
| DFFB                  | 1.0951        | 1.036666      | 1.337874      | 0.651726      | 0.430252      | 0.568617      | 0.002238      | -0.85016      |               |                |
| FER1L6                | 0.393484      | 0.445076      | 0.192419      | 0.139833      | 0.068398      | 0.018049      | 0.002244      | -1.16073      |               |                |
| SATB2                 | 2.134646      | 2.314922      | 2.406919      | 1.508137      | 1.349354      | 1.060909      | 0.002267      | -0.61771      |               |                |
| TNFAIP8               | 6.871059      | 3.620236      | 6.202576      | 3.231039      | 3.691074      | 2.31925       | 0.002553      | -0.7425       |               |                |
| TSPYL4                | 1.709124      | 1.600488      | 1.801034      | 1.065735      | 0.568617      | 0.002238      | -0.85016      |                |               |                |
| EFEMP1                | 3.275656      | 2.720255      | 3.343313      | 1.498781      | 1.86399       | 2.232671      | 0.002636      | -0.60215      |               |                |
| ZNF711                | 1.229855      | 1.526063      | 0.997116      | 0.609294      | 0.464909      | 0.576671      | 0.003055      | -0.80058      |               |                |
| RHEBL1                | 0.740553      | 1.36955       | 1.407835      | 0.707241      | 0.909327      | 0.710167      | 0.003197      | -0.67007      |               |                |
| TNS4                  | 1.540211      | 1.36955       | 1.070241      | 0.909327      | 0.710167      | 0.003197      | -0.67007      |                |               |                |
| DENND2C               | 0.453597      | 0.400786      | 0.459166      | 0.12306       | 0.243741      | 0.229054      | 0.003234      | -0.91513      |               |                |
| Homo_sapiens_newGene_6435 | 1.187504 | 0.823004      | 0.944247      | 0.466384      | 0.637231      | 0.527613      | 0.003237      | -0.81275      |               |                |
| SLC14A1               | 13.01935      | 16.80068      | 14.20577      | 7.542338      | 9.654557      | 6.565457      | 0.003389      | -0.66442      |               |                |
| CHN1                  | 3.324822      | 2.706417      | 2.184516      | 0.68278       | 0.862318      | 0.003545      | -0.96731      |                |               |                |
| GRPR                  | 1.79412       | 1.253153      | 0.754189      | 0.179674      | 0.340364      | 0.258733      | 0.003142      | -1.09408      |               |                |
| Homo_sapiens_newGene_16783 | 1.91423 | 2.780488      | 2.202742      | 0.974824      | 1.430323      | 1.422407      | 0.003922      | -0.74939      |               |                |
| NUBPL                 | 1.660597      | 1.905453      | 1.749792      | 1.252279      | 0.819859      | 0.889898      | 0.003612      | -0.70491      |               |                |
| TMOD1                 | 2.146539      | 1.128214      | 0.999325      | 0.711674      | 0.794531      | 0.785569      | 0.004034      | -0.64977      |               |                |
| UBE2A                 | 1.7697       | 1.327915      | 1.214765      | 0.728147      | 0.829393      | 0.783485      | 0.00393       | -0.78998      |               |                |
| PLA2R1                | 0.407507      | 0.435886      | 0.34592       | 0.261356      | 0.235616      | 0.244798      | 0.003776      | -0.62716      |               |                |
| EDN2                  | 1.333656      | 1.397974      | 0.961695      | 0.389583      | 0.284718      | 0.61461       | 0.003883      | -1.02844      |               |                |
| Homo_sapiens_newGene_11003 | 1.19423 | 2.780488      | 2.202742      | 0.974824      | 1.430323      | 1.422407      | 0.003922      | -0.74939      |               |                |
| LYRM7                 | 1.7697       | 1.327915      | 1.214765      | 0.728147      | 0.829393      | 0.783485      | 0.00393       | -0.78998      |               |                |
| RNF144A               | 1.465395      | 1.128214      | 0.999325      | 0.711674      | 0.794531      | 0.785569      | 0.004034      | -0.64977      |               |                |
| PLPP6                 | 1.018892      | 0.722138      | 0.783054      | 0.366829      | 0.504012      | 0.316805      | 0.004177      | -0.88572      |               |                |
| Gene                  | MAP3K8 | PPP6C   | DDHD1   | TSC22D3 | TTBK2   | NREP    | ENO2    | NREP     | PPP6C    | ENO2     |
|-----------------------|--------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                       | 4.247634 | 4.292259 | 3.943786 | 2.931032 | 2.675319 | 2.229954 | 0.004195 | -0.6243  | -0.6319  | -0.65079 |
| PPP6C                 | 18.1841 | 19.93534 | 19.98051 | 8.113862 | 13.83723 | 14.38045 | 0.00438  | -0.63121 | -0.69854 | -0.82952 |
| DDHD1                 | 1.280379 | 0.468259 | 0.968002 | 0.69942  | 0.344076 | 0.336249 | 0.005395 | -0.78146 | -0.79759 | -0.86608 |
| TSC22D3               | 4.797785 | 5.216566 | 6.553484 | 3.136087 | 3.300617 | 4.127657 | 0.004689 | -0.61403 | -0.64789 | -0.80673 |
| TTBK2                 | 1.121283 | 0.776908 | 0.89249  | 0.46478  | 0.695803 | 0.004833 | -0.65104 | -0.79759 | -0.85343 | -0.75413 |
| NREP                  | 1.275785 | 1.636268 | 1.234138 | 0.971605 | 0.690854 | 0.005904 | -0.65904 | -0.77042 | -0.77113 | -0.84929 |
| ENO2                  | 10.11191 | 8.447873 | 7.223637 | 6.309129 | 5.5904  | 0.006096 | -0.65079 | -0.77042 | -0.77113 | -0.84929 |
| Homo_sapiens_newGene_9381 | 0.846686 | 0.957527 | 0.634182 | 0.499923 | 0.34579 | 0.006883 | -0.77042 | -0.77113 | -0.84929 | -0.77113 |
| MUC5AC                | 5.428519 | 4.14587 | 3.554224 | 2.640128 | 3.5578  | 1.774004 | 0.06904 | -0.66068 | -0.77113 | -0.84929 |
| TET2                  | 1.574372 | 1.413961 | 1.318494 | 0.800504 | 1.266363 | 0.639523 | 0.00918 | -0.64789 | -0.85062 | -0.85062 |
| KIA1324               | 0.595512 | 0.555009 | 0.74921  | 0.29943  | 0.35642 | 0.228964 | 0.00694 | -0.85062 | -0.85062 | -0.85062 |
| PGAP1                 | 0.633873 | 0.731709 | 0.548574 | 0.390481 | 0.563801 | 0.242551 | 0.007413 | -0.65626 | -0.85062 | -0.85062 |
| GYG2                  | 2.230565 | 2.034378 | 2.082052 | 1.60714  | 0.993089 | 0.850894 | 0.007995 | -0.75413 | -0.85062 | -0.85062 |
| NCR3LG1               | 1.574372 | 3.16244 | 2.291885 | 1.765037 | 2.33564 | 1.227433 | 0.007995 | -0.63235 | -0.65626 | -0.85062 |
| CYP4V2                | 3.626261 | 2.926301 | 3.21031 | 2.061473 | 2.43626 | 1.427779 | 0.00808 | -0.65562 | -0.85062 | -0.85062 |
| HNRNPUL2-BSCL2        | 0.734284 | 1.954682 | 1.33757 | 0.709124 | 0.539421 | 0.66528 | 0.008636 | -0.84929 | -0.77113 | -0.77046 |
| Homo_sapiens_newGene_18015 | 2.412153 | 2.981985 | 2.744823 | 1.850464 | 1.315056 | 1.050363 | 0.00896 | -0.77046 | -0.77046 | -0.77046 |
| Homo_sapiens_newGene_3473 | 1.769805 | 1.728875 | 1.434468 | 0.463312 | 0.897928 | 0.871072 | 0.009053 | -0.7624  | -0.7624  | -0.7624  |
| ZBED6                 | 2.872209 | 6.890346 | 3.334087 | 1.363568 | 2.252321 | 2.947912 | 0.009146 | -0.7048  | -0.7048  | -0.7048  |
| RASEF                 | 0.98291 | 1.428639 | 1.071277 | 0.706203 | 0.901917 | 0.65385 | 0.00988 | -0.6084  | -0.6084  | -0.6084  |
| Gene                        | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  |
|-----------------------------|---------|---------|---------|---------|---------|---------|
| SMIM8                       | 1.762505| 1.978571| 2.059238| 1.499622| 1.21533 | 1.088222|
| M6PR                        | 112.4689| 74.20011| 70.68014| 27.16177| 42.00726| 40.54833|
| BBIP1                       | 5.407204| 7.08917 | 6.854933| 5.619515| 4.253052| 4.423478|
| PCDHB2                      | 1.070381| 2.317392| 1.995474| 0.970748| 1.098357| 0.784126|
| HECTD2                      | 1.562695| 1.896903| 1.106978| 1.096846| 1.4231  | 0.761871|
| MAP3K14                     | 3.932573| 3.523592| 4.903115| 3.402665| 3.252134| 0.14045 |
| Homo_sapiens_newGene_9941   | 0.921718| 2.215119| 1.62058 | 1.002614| 0.483116| 0.507041|
| DCUN1D4                     | 5.266047| 5.963024| 9.093846| 3.51441 | 5.577426| 3.878752|
| ABAT                        | 0.228322| 0.345407| 0.288923| 0.110843| 0.087918| 0.131753|
| Homo_sapiens_newGene_2442   | 2.110237| 2.762366| 0.972547| 1.675915| 1.55622 | 0.641263|
| HRH1                        | 7.784245| 8.234079| 10.63142| 5.170688| 5.990987| 7.142766|
| SYDE2                       | 0.46687 | 0.52571 | 0.459329| 0.309704| 0.300218| 0.210399|
| SOST                        | 0.630854| 0.382971| 0.433922| 0.09892 | 0.258917| 0.115611|
| Homo_sapiens_newGene_2565   | 0.789087| 0.92248 | 0.830477| 0.372233| 0.286051| 0.350589|
| RASSF5                      | 0.360862| 0.376555| 0.216683| 0.053304| 0.069174| 0.053035|
| RRAD                        | 0.713031| 0.599678| 0.691778| 0.182444| 0.341339| 0.269868|
| LYNX1                       | 0.654522| 0.679714| 0.739887| 0.272496| 0.315758| 0.50724 |
| KIF17                       | 0.629933| 0.765524| 0.669526| 0.306566| 0.458644| 0.32317 |
| SHANK2                      | 0.157632| 0.204793| 0.09115 | 0.046093| 0.061733| 0.166158|
| GPR75                       | 1.908388| 1.739144| 1.630834| 1.351283| 0.970303| 0.685149|
| WSCD1                       | 1.26576 | 0.622022| 0.847066| 0.524002| 0.827925| 0.578168|
| ANGPTL4                     | 3.052991| 2.461826| 2.65051 | 2.191522| 1.712359| 1.759507|
| Homo_sapiens_newGene_14605  | 0.869991| 0.774893| 0.713277| 0.472717| 0.400777| 0.48765 |
| ZNF461                      | 2.379655| 2.625006| 3.774701| 1.681068| 2.008917| 1.682485|
| PITPNB                      | 32.90992| 15.88405| 14.86014| 12.90569| 13.70922| 12.87924 |
| HNMT                        | 2.638179| 2.75444 | 2.812864| 2.915529| 2.138586| 2.177175 |
| Gene          | 0.325556 | 0.268607 | 0.295011 | 0.183007 | 0.209777 | 0.135122 | 0.019899 | -0.66588 |
|--------------|---------|---------|---------|---------|---------|---------|---------|---------|
| STOX1        | 0.613619 | 0.65969 | 0.477787 | 0.398221 | 0.175695 | 0.187602 | 0.019961 | -0.91499 |
| TBC1D2       | 1.946001 | 1.281174 | 1.810924 | 1.168239 | 1.154764 | 0.846412 | 0.020377 | -0.59363 |
| GCNT4        | 0.386455 | 0.318465 | 0.241211 | 0.080359 | 0.192928 | 0.143289 | 0.020405 | -0.84471 |
| DCTN4        | 13.30918 | 6.708763 | 6.583013 | 5.243724 | 5.70718 | 5.400737 | 0.020405 | -0.61502 |
| ULBP3        | 4.530145 | 5.558226 | 3.476562 | 1.928683 | 3.005068 | 2.748092 | 0.021057 | -0.69143 |
| ATP11A       | 5.339116 | 5.35254 | 4.277499 | 3.630235 | 3.972212 | 4.655154 | 0.023342 | -0.62565 |
| C6orf223     | 0.412533 | 0.428406 | 0.401765 | 0.171172 | 0.165642 | 0.265263 | 0.022378 | -0.79502 |
| ELK3         | 8.810444 | 8.203709 | 6.576641 | 3.366344 | 6.030389 | 4.655154 | 0.023342 | -0.62565 |
| HOXB4        | 0.287639 | 0.341692 | 0.367469 | 0.08286 | 0.164107 | 0.175745 | 0.023588 | -0.84724 |
| SERPINB2     | 0.999767 | 0.647586 | 0.553644 | 0.052788 | 0.378952 | 0.217936 | 0.024046 | -0.89983 |
| PRDM16       | 0.219762 | 0.158797 | 0.190799 | 0.057798 | 0.088188 | 0.095353 | 0.024836 | -0.78897 |
| KLHL3        | 0.91225 | 0.733554 | 0.449753 | 0.414426 | 0.322249 | 0.444291 | 0.026264 | -0.68041 |
| TRIM16       | 65.47371 | 101.0562 | 69.66636 | 29.66058 | 44.99923 | 55.93444 | 0.028376 | -0.80999 |
| Homo_sapiens_newGene_4091 | 3.723103 | 3.530701 | 2.765759 | 1.864516 | 2.842361 | 2.271306 | 0.028836 | -0.59181 |
| CASP2        | 12.35615 | 11.30945 | 10.14302 | 6.077652 | 5.675148 | 2.431811 | 0.029245 | -0.84768 |
| TTL7         | 0.626726 | 0.611691 | 0.448822 | 0.352627 | 0.421072 | 0.287586 | 0.029391 | -0.60461 |
| Homo_sapiens_newGene_4037 | 1.259538 | 1.256672 | 0.915253 | 0.493738 | 0.648507 | 0.826301 | 0.031301 | -0.68608 |
| SLC16A2      | 0.744281 | 0.786228 | 0.622309 | 0.365668 | 0.419714 | 0.232291 | 0.03273 | -0.70441 |
| CLDN12       | 5.693017 | 9.11269 | 4.640477 | 3.84175 | 4.32201 | 4.182759 | 0.032983 | -0.60474 |
| SRSF12       | 0.554057 | 0.419128 | 0.492656 | 0.309509 | 0.161193 | 0.137455 | 0.035683 | -0.76059 |
| ELF4         | 19.09968 | 17.10438 | 37.5084 | 15.30848 | 11.249 | 8.603636 | 0.035738 | -0.77467 |
| IGFBP1       | 5.227748 | 4.880016 | 9.899646 | 1.743768 | 4.576859 | 4.132454 | 0.035962 | -0.72465 |
| PDP2         | 2.947326 | 3.161161 | 3.67897 | 1.378737 | 1.118173 | 1.190587 | 0.037723 | -0.83025 |
| HYAL1        | 0.647562 | 1.440799 | 0.799953 | 0.72647 | 0.55379 | 0.454863 | 0.040701 | -0.71927 |
| Gene                             | Value1  | Value2  | Value3  | Value4  | Value5  | Value6  | Value7  | Value8  |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| DRAM1                           | 2.583682| 3.691201| 2.840002| 2.030944| 2.77806 | 1.632382| 0.044347| -0.66013|
| MTERF1                          | 3.542802| 7.794738| 5.99038 | 2.964223| 4.252183| 4.056907| 0.044493| -0.63431|
| Homo_sapiens_newGene_19415      | 1.872375| 1.939341| 1.076982| 0.952992| 0.819049| 0.811055| 0.044626| -0.61762|
| OTUB2                           | 0.87187 | 0.592072| 0.642193| 0.52436 | 0.429121| 0.311721| 0.044937| -0.65597|
| ASAH2                           | 0.35285 | 1.679346| 0.489389| 0.242084| 0.211775| 0.864112| 0.045527| -0.61923|
| Homo_sapiens_newGene_1788       | 0.451422| 0.3131  | 0.393857| 0.218804| 0.124978| 0.201038| 0.047937| -0.75819|
| APOLD1                          | 3.775425| 0.292918| 11.72284| 0.258494| 0.822367| 0.304073| 0.048398| -0.70976|
Here, we present the STR certificates for Huh7 (page 2-4), HCCLM3 (page 5-7) and MHCC97H (page 8-17) cell lines, respectively.
Entrusted by Zhejiang University, CCTCC has conducted identification experiments on the Huh-7 cell line, and come to the following conclusions:

1. There was no third allele found in Huh-7 cell line, it indicating that there was no cross-contaminant of human source cell line.

2. Compared the STR data of Huh-7 cell line in the databases of ATCC and DSMZ, all the loci of Huh-7 were exactly matched with the loci of HuH-7 (JCRB0403) cells found in DSMZ cell bank, so it is HuH-7 (JCRB0403) cell line (Table 1).

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Note:
1. The result is only responsible for the test sample, and the genomic DNA will be reserved for three month.
2. Reference of human cell line authentication: ANSI/ATCC ASN-0002-2011
Table 1. The alleles of 21 locations in Huh-7 cell line

| Marker       | Allele 1 | Allele 2 |
|--------------|----------|----------|
| D19S433      | 13       | 14       |
| D5S818       | 12       | 12       |
| D21S11       | 30       | 30       |
| D18S51       | 15       | 15       |
| D6S1043      | 13       | 15       |
| AMEL         | X        | X        |
| D3S1358      | 15       | 15       |
| D13S317      | 10       | 11       |
| D7S820       | 11       | 11       |
| D16S539      | 10       | 10       |
| CSF1PO       | 11       | 11       |
| Penta D      | 12       | 12       |
| D2S441       | 12       | 14       |
| vWA          | 16       | 18       |
| D8S1179      | 14       | 14       |
| TPOX         | 8        | 11       |
| Penta E      | 11       | 11       |
| TH01         | 7        | 7        |
| D12S391      | 20       | 21       |
| D2S1338      | 19       | 19       |
| FGA          | 22       | 23       |
Entrusted by Zhejiang UniVelsity, CCTCC has conducted identification experiments on the HCC-LM3 cell line, and come to the following conclusions:

1. There was no thii d allele found in HCC-LM3 cell line, it indicating that there was no cross-contaminant of human source cell line.

2. Compared the STR data of HCC-LM3 cell line in the databases of ATCC and DSMZ, its profile does not exactly match with any of the crIFl ent data (Table 1).

3. 1 he STR data of BICC-LM3 cell line and NCI-hI82 (HTB-175) cell line hatches the highest rate of 73% in ATCC database.

Manager:

China Center fo

Note:

1. T fee result is on ly responsib e or die test sample, and the genomic DNA will be reserved for three
naonlta.

2. Reference of human cell line authentication: ANS1/ATCC A SN-0002-2011
Table 1. The alleles of 21 locations in HCC-LM3 cell line

| Marker       | Allele 1 | Allele 2 |
|--------------|----------|----------|
| D19S433      | 13       | 14       |
| D5S818       | 12       | 13       |
| D21S11       | 31.2     | 31.2     |
| D18S51       | 13       | 22       |
| D6S1043      | 12       | 20       |
| AMEL         | X        | Y        |
| D3S1358      | 15       | 16       |
| D13S317      | 8        | 8        |
| D7S820       | 10       | 10       |
| D16S539      | 12       | 12       |
| CSF1PO       | 11       | 13       |
| Penta D      | 8        | 9        |
| D2S441       | 15       | 15       |
| vWA          | 14       | 14       |
| D8S1179      | 12       | 13       |
| TPOX         | 8        | 8        |
| Penta E      | 17       | 17       |
| TH01         | 9        | 9        |
| D12S391      | 18       | 18       |
| D2S1338      | 20       | 20       |
| FGA          | 21       | 24       |
细胞遗传质量鉴定检测

Cell Line Authentication Service

STR 基因型检测报告

样品信息

样品编号:

| 客户样本编号 | 公司编号 |
|--------------|----------|
| MHCC-97H     | 20190409-01 |

样品数量：1

样品性状：细胞系

检测项目：STR
检测方法：用 Axygen 的基因组抽提试剂盒提取 DNA, 采用 20-STR 扩增方案扩增, 在 ABI 3730XL 型遗传分析仪上对 STR 位点和性别基因 Amelogenin 进行检测。

样品信息

（一）检验基本情况

| 公司编号 | 多等位基因 | 匹配细胞系 | 细胞库 | EV 值 | 匹配说明 |
|----------|------------|------------|--------|-------|----------|
| 20190409-01 | 无         | DSMZ       |        | -     | 无匹配   |

样本基因型检验结果

- 多等位基因指三等位及以上基因现象。
- 本次检测各细胞分型结果良好。

（二）各样本描述

- 20190409-01：该株细胞 DNA 分型在细胞系检索中没有找到匹配的细胞系，本次检测在该细胞系中没有发现多等位基因。该细胞系未发现多等位基因、未发现交叉污染，细胞系无异常，因数据库未收录 MHCC-97H 相关 STR 信息无法匹配，若为发表论文用，提交该数据给杂志即可。

备注：待测细胞系与收录于 ATCC, DSMZ, JCRB 和 RIKEN 数据库的细胞系 STR 数据进行比对，未收录于以上细胞库的细胞系将无法匹配。

（三）样本分析结果

| Loci | 送检细胞 STR 信息 | 细胞库细胞 STR 信息 |
|------|--------------------|----------------------|
|      | 送检细胞名：MHCC-97H | 细胞库细胞名： |
|      | Allele1   Allele2   Allele3 | Allele1 Allele2 Allele3 |
| D5S818 | 12         13       |                  |
| D13S317 | 8          8        |                  |
| D7S820 | 10        10       |                  |
| D16S539 | 12         12       |                  |

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|     | VWA  |     | TH01 |     | AMEL |     | TPOX |     | CSF1PO |     | D12S391 |     | FGA    |     | D2S1338 |     | D21S11 | 31.2 | D18S51 | 13  | D8S1179 |     | D3S1358 |     | D6S1043 |     | PENTAE |     | D19S433 |     | PENTAD | 8    | 9     |
|-----|------|-----|------|-----|------|-----|------|-----|--------|-----|---------|-----|--------|-----|---------|-----|---------|-----|---------|-----|---------|-----|--------|-----|--------|-----|--------|-----|        |
| 1   | 14   | 14  | 9    | 9   | X     | Y   | 8    | 8   | 11     | 13  | 18     | 18  | 21     | 24  | 20     | 20  | 31.2   | 31.2 | 13     | 22  | 12     | 13  | 15     | 16  | 12     | 20  | 11     | 17  | 13     | 14  | 8      | 9   |        |
| 2   |      |     |      |     |       |     |      |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |

### 其他说明

（一）分型方案及位点信息


| 方案 1 | 方案 2 | 方案 3 | 方案 4 |
|--------|--------|--------|--------|
| 1      | TH01   | TPOX   | D3S1358 |
| 2      | D12S391| VWA    | D13S317 | D5S818 |
|  | D7S820 | D8S1179 | D6S1043 | D2S1338 |
|---|---|---|---|---|
| 3 |   |   |   |   |
| 4 | CSF1PO | PENTAD | D16S539 | D21S11 |
| 5 | FGA |   | D19S433 | D18S51 |
| 6 | PENTAE |   |   |   |

实验方案及位点

（二）STR 数据库比对

本公司采用 DSMZ tools 进行细胞系比对，其中包含来自于 ATCC, DSMZ, JCRB 和 RIKEN 数据库的 2455 个细胞系 STR 数据。如果待检测细胞未收录于以上细胞库或这是自行建立的新细胞系将无法进行比对，用户需根据细胞分型结果自行与其他数据库进行比对。

签发日期：2019-04-24
| Sample Name | STR Profile | allele 11 | allele 17 | allele 8 | allele 9 | allele 13 | allele 14 |
|-------------|-------------|-----------|-----------|----------|----------|-----------|----------|
| MHCC-97H    | STR Profile 1 |          |           |          |          |           |          |
| D10S435     | STR Profile 2 |          |           |          |          |           |          |
Cell Line Authentication 0008

| Sample File | Sample Name | Panel | OS | SG |
|-------------|-------------|-------|----|----|
| 03_F30_03A | varo123     | STR Profile 3 human |     |    |

D35126     D35537     D651343     D1005932

al 16       al 12       al 12       al 9       al 10

D195439

al 14       al 17

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