

# Project Bioinformatic Resources

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## Introduction

The following analysis focus on RNA-seq count data extracted from different cancer datasets from the Cancer Genome Atlas (TCGA). From the original TCGA data 50 cases (tumor samples) and 50 controls (normal samples) were randomly selected.

## Analysis

The packages needed for the analysis are the following:

```
library(sessioninfo)
library(tidyverse)
library(biomaRt)
library(MotifDb)  # large collection of motifs across different species
library(seqLogo)
library(PWMErich)
library(PWMErich.Hsapiens.background)
library(GEOquery)
library(oligo)
library(pd.hg.u133.plus.2)
library(hgu133plus2.db)
library(genefilter)
library(limma)
library(pheatmap)
library(stringr)
library(GenomicFeatures)  # to build object with specific information such as genomic coordinates
library(ggplot2)
library(edgeR)  # designed to perform Differential Expression Analysis from RNA-Seq data
library(fgsea)  # computation of enrichment scores and other statistics
library(org.Hs.eg.db)  # database annotation human specific transcript from Ensembl
library(clusterProfiler)  # uses Fisher test, explore gene list of interest against a reference
library(enrichplot)  # build enrich map
library(ggnewscale)
library(DOSE)
library(pathview)  # contains cartoons of pathways and we project on them our genes of interest
```

## Task 1: Load data

In particular, we consider data coming from **Lung adenocarcinoma**.

```
load("./RData/Lung_adenocarcinoma.RData")
```

After loading the data, the following three data-frames are available:

- `raw_counts_df` which contains the raw RNA-seq counts;
- `c_anno_df`, which contains sample name and condition (case and control);
- `r_anno_df`, which contains the ENSEMBL genes ids, the length of the genes and the genes symbols.

## Task 2: Filter protein coding genes

To extract only protein coding genes from `raw_counts_df` and `r_anno_df`, we use the `biomaRt` package.

First, we retrieve the information about the protein coding genes from Ensembl.

```
database <- useMart("ensembl")
datasetHuman <- useDataset("hsapiens_gene_ensembl", mart = database)
query <- getBM(attributes = c("ensembl_gene_id", "external_gene_name", "gene_biotype"),
  filters = c("ensembl_gene_id", values = r_anno_df$ensembl_gene_id, mart = datasetHuman)

query_protein_coding <- query[which(query$gene_biotype == "protein_coding"), ]
```

Then, we filter the data frames containing the raw counts and the annotation to keep only the protein coding genes.

```
indexes_r_anno_df <- which(r_anno_df$ensembl_gene_id %in% query_protein_coding$ensembl_gene_id)
r_anno_df_protein_coding <- r_anno_df[indexes_r_anno_df, ]

indexes_raw_counts_df <- which(rownames(raw_counts_df) %in% query_protein_coding$ensembl_gene_id)
raw_counts_df_protein_coding <- raw_counts_df[indexes_raw_counts_df, ]
```

## Task 3: Differential expression analysis

To perform the differential expression analysis, we will use the `edgeR` package.

It is important to remove genes with low signal that will have low statistical power. Since, we want to focus on the transcripts we can use to perform the analysis, we can filter raw counts data using a threshold of raw count  $> 20$  in at least 5 replicates.

```
# count threshold
count_thr <- 20

# number of replicates with more counts than the count threshold
repl_thr <- 5

filter_vec <- apply(raw_counts_df_protein_coding, 1, # go through all count matrices by rows
  function(y) max(by(y, c_anno_df$condition, function(x) sum(x>=count_thr))))
# groups the values on each condition and sum all the values above the count
```

Then, we filter the previously updated data frames.



```
long_counts_df <- gather(as.data.frame(filter_counts_df), key = "sample", value = "read_number")

ggplot(data = long_counts_df, aes(sample, read_number + 1)) + geom_boxplot(colour = "deeppink4",
  fill = "deeppink4", alpha = 0.7) + theme_bw() + scale_y_log10()
```

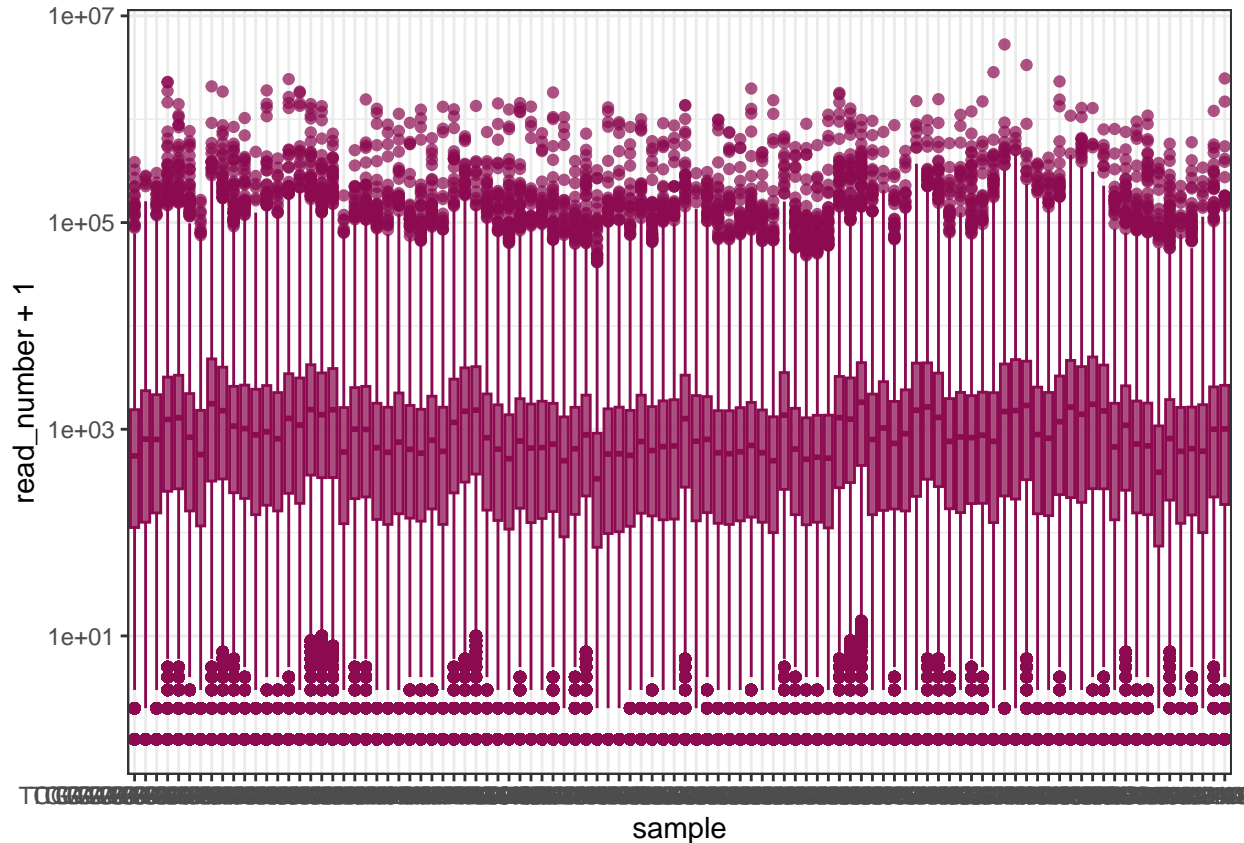


Figure 2: Boxplot of gene counts before normalization.

As we can see from the plots, there is a significant variability across samples in term of library sizes (reads per million). We have to take into account this aspect because the expected size of each count is the product of the relative abundance of that gene in that sample but also of the library size.

As we can see from the boxplot, we need to normalize our data before testing for differential expression. Normalization can be obtained using different methodologies. Among them, TMM (the default method) is a method that consider in the normalization also variables related to the library size.

To perform the DEG analysis, we first need to create a `DGRLIST` object containing information about counts, annotation, samples and genes. To do that, we use the function `DGRLIST` to create the input for the following normalization step. This object contains information about counts, samples and genes.

The normalization intra- and inter-sample is done using the function `calcNormFactors` and specifying `method = "TMM"`, which is the weighted trimmed mean of M-values approach.

```
edge_c <- DGELIST(counts = filter_counts_df, group = c_anno_df$condition, samples = c_anno_df,
  genes = filter_anno_df)

# computing norm factors for TMM normalization
edge_n <- calcNormFactors(edge_c, method = "TMM")
```

Then, we create a cpm table containing the normalized expression values for each transcript expressed as counts per million (CPM).

```
# create a cpm table (normalized expression values)  
cpm_table <- as.data.frame(round(cpm(edge_n), 2))
```

To see the effect of the normalization, we look at the boxplot distribution of gene expression signals after normalization.

```
# look at the boxplot distribution of gene expression signals after  
# normalization  
long_cpm_df <- gather(cpm_table, key = "sample", value = "CPM")  
  
ggplot(data = long_cpm_df, aes(sample, CPM + 1)) + geom_boxplot(colour = "olivedrab",  
  fill = "olivedrab", alpha = 0.7) + theme_bw() + scale_y_log10()
```

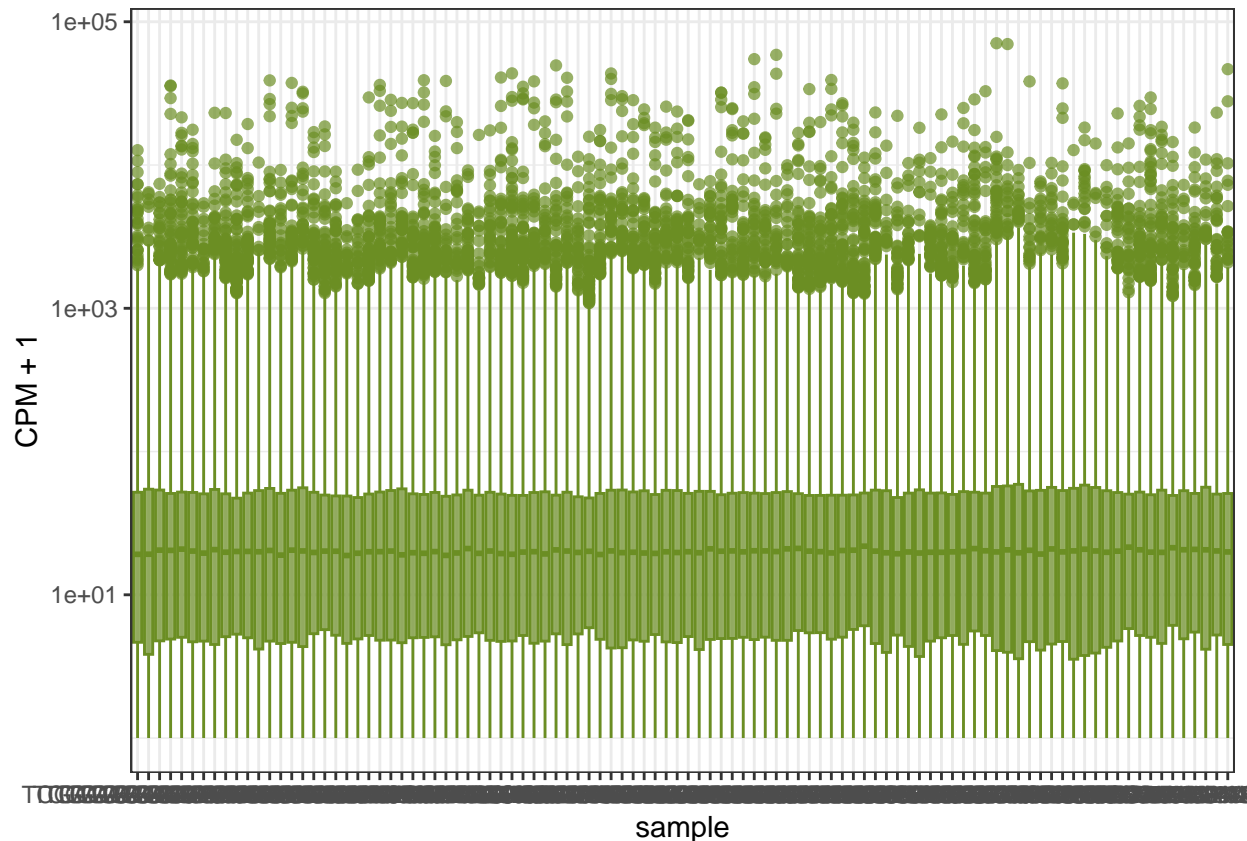


Figure 3: Boxplot distribution of gene expression signals after normalization.

We notice that, with respect to the previous boxplot, after the normalization, the distributions are comparable. That means that now our data is ready to be tested for DE analysis.

We define the experimental design matrix, later needed to calculate the dispersion and fit. This matrix is based on the experimental design, so we define the conditions we want to test (case VS control).

```
design <- model.matrix(~0 + group, data = edge_n$samples)
colnames(design) <- levels(edge_n$samples$group)
rownames(design) <- edge_n$samples$sample
```

Once we normalized the data and the design, we proceed by calculating the dispersion fit.

```
# calculate dispersion and fit with edgeR (necessary for differential
# expression analysis)
edge_d <- estimateDisp(edge_n, design)
edge_f <- glmQLFit(edge_d, design)
```

The `estimateDisp` function tries to estimate the variability at different levels: in the data, inter sample and intra sample. The over dispersion of counts across the samples can be modeled as a Poisson distribution, which can be approximated using a negative binomial distribution by using `glmQLFit` function.

We define the contrasts (conditions to be compared).

```
contro <- makeContrasts("control-case", levels = design)
```

We performed a test through function `glmQLFTest` to determine which genes are differentially expressed. Then, we selected genes based on a 0.01 p-value cutoff and ordered them based on the log2 fold change.

```
# fit the model with generalized linear models
edge_t <- glmQLFTest(edge_f, contrast = contro)
DEGs <- as.data.frame(topTags(edge_t, n = 20000, p.value = 0.01, sort.by = "logFC"))
```

Then, we improve the selection, considering not only the p-value, but also the average expression of the genes (logCPM). We used the logFC value to assign genes to different classes:

- up-regulated genes if  $\log FC > 1.5$
- down-regulated genes if  $\log FC < -1.5$
- not significant genes (unchanged) otherwise.

```
DEGs$class <- "="
DEGs$class[which(DEGs$logCPM > 1 & DEGs$logFC > 1.5 & DEGs$FDR < 0.25)] = "+" # upregulated genes
DEGs$class[which(DEGs$logCPM > 1 & DEGs$logFC < (-1.5) & DEGs$FDR < 0.25)] = "-" # downregulated genes
DEGs <- DEGs[order(DEGs$logFC, decreasing = T), ]
```

```
head(DEGs)
```

##	ensembl_gene_id	external_gene_name	length	logFC	logCPM	
##	ENSG00000179914	ENSG00000179914	ITLN1	8640	6.684901	5.8661078
##	ENSG00000108576	ENSG00000108576	SLC6A4	41683	6.084705	6.6338451
##	ENSG00000180440	ENSG00000180440	SERTM1	23819	5.663190	3.2093449
##	ENSG00000108342	ENSG00000108342	CSF3	2452	5.588520	5.2512424
##	ENSG00000034971	ENSG00000034971	MYOC	17271	5.397462	1.5811486
##	ENSG00000178084	ENSG00000178084	HTR3C	7626	5.325742	0.5517057
##	F	PValue	FDR	class		
##	ENSG00000179914	75.57703	6.388727e-14	4.459213e-13	+	
##	ENSG00000108576	122.16543	3.992071e-19	7.518401e-18	+	

```
## ENSG00000180440 181.47838 2.383659e-24 1.325115e-22 +
## ENSG00000108342 90.91727 8.943402e-16 8.552128e-15 +
## ENSG00000034971 170.30732 1.866103e-23 8.293843e-22 +
## ENSG00000178084 120.55392 5.781068e-19 1.046585e-17 =
```

```
table(DEGs$class) # 1193-, 877+, 14949=
```

```
##
##      -      +      =
## 1199  884  9258
```

From the results, we saw that 1193 genes are down-regulated, 877 genes are up-regulated and 14949 genes have no changes in their regulation.

We then create the volcano plot.

```
input_df <- DEGs
xlabel <- "log2 FC case vs control"
ylabel <- "-log10 p-value"

par(fig = c(0, 1, 0, 1), mar = c(4, 4, 1, 2), mgp = c(2, 0.75, 0))
plot(input_df$logFC, -log(input_df$PValue, base = 10), xlab = xlabel, ylab = ylabel,
     col = ifelse(input_df$class == "=", "grey70", "olivedrab4"), pch = 20, frame.plot = TRUE,
     cex = 0.8, main = "Volcano plot")
abline(v = 0, lty = 2, col = "grey20")
```

We also report the heatmap of only up and down-regulated genes.

```
# only up and down regulated genes
cols <- c(ifelse(c_anno_df$condition == "case", "chartreuse4", "burlywood3"))
pal <- c("blue", "white", "red")
pal <- colorRampPalette(pal)(100)
heatmap(as.matrix(cpm_table[which(rownames(cpm_table) %in% DEGs$ensembl_gene_id[which(DEGs$class !=
    "=")]), ]), ColSideColors = cols, cexCol = 0.5, margins = c(4, 4), col = pal,
    cexRow = 0.2)
```

To simplify the later analysis, we save the list of differentially expressed genes in a text file.

```
up_DEGs <- DEGs[which(DEGs$class == "+"), ]
down_DEGs <- DEGs[which(DEGs$class == "-"), ]

write.table(up_DEGs, file = "up_DEGs.txt", row.names = F, col.names = T, sep = "\t",
    quote = F)
write.table(down_DEGs, file = "down_DEGs.txt", row.names = F, col.names = T, sep = "\t",
    quote = F)
write.table(DEGs, file = "DEGs.txt", row.names = F, col.names = T, sep = "\t", quote = F)
```

## Task 4: Gene set enrichment analysis

To perform the gene set enrichment analysis, we will use the `clusterProfiler` package.

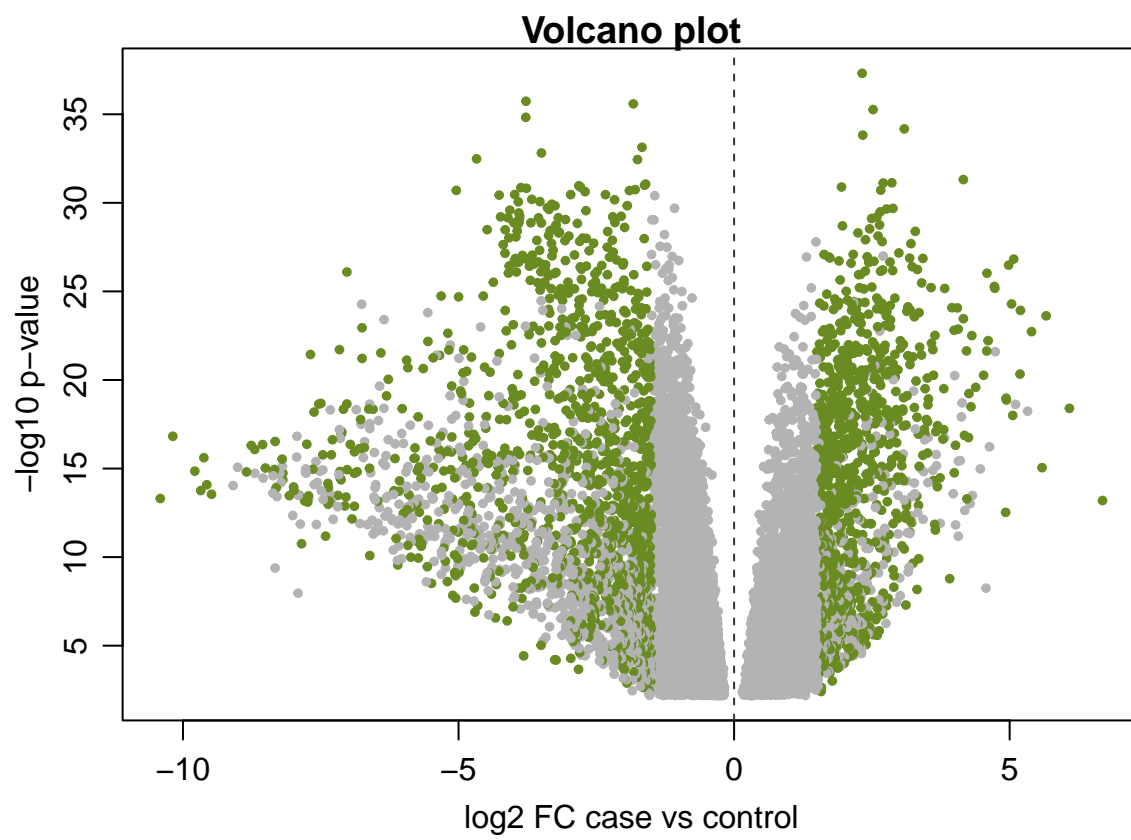
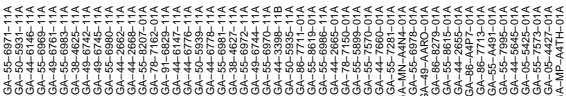


Figure 4: Volcano plot





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```
DEGs <- read.table("DEGs.txt", header = T, sep = "\t", as.is = T)
table(DEGs$class)
```

```
##
##      -      +      =
## 1199   884  9258
```

We use the biomaRt package to retrieve the `entrezgene_id` for all the genes in the DEGs dataset.

```
ensembl <- useEnsembl(biomaRt = "ensembl", dataset = "hsapiens_gene_ensembl")
convert <- getBM(attributes = c("ensembl_gene_id", "entrezgene_id"), filters = c("ensembl_gene_id"),
  values = DEGs$ensembl_gene_id, mart = ensembl)

DEGs <- merge(DEGs, convert, by.x = "ensembl_gene_id", by.y = "ensembl_gene_id") # include the new info
DEGs <- DEGs[which(!is.na(DEGs$entrezgene_id)), ]
DEGs <- DEGs[-which(duplicated(DEGs$entrezgene_id)), ]
```

We removed all the NA and duplicates in the dataset DEGs.

We created new lists for the down and up-regulated genes.

```
# list of up-regulated genes
upDEGs <- DEGs %>%
  filter(class == "+")
# list of down-regulated genes
downDEGs <- DEGs %>%
  filter(class == "-")
```

## Performing enrichment analysis for GO biological process

```
# biological process up regulated genes
ego_BP_up <- enrichGO(gene = upDEGs$external_gene_name, OrgDb = org.Hs.eg.db, keyType = "SYMBOL",
  ont = "BP", pAdjustMethod = "BH", pvalueCutoff = 0.05, qvalueCutoff = 0.05)
```

```
# biological process down regulated genes
ego_BP_down <- enrichGO(gene = downDEGs$external_gene_name, OrgDb = org.Hs.eg.db,
  keyType = "SYMBOL", ont = "BP", pAdjustMethod = "BH", pvalueCutoff = 0.05, qvalueCutoff = 0.05)
```

```
barplot(ego_BP_up, showCategory = 10)
```

Both the first two biological processes are related to the microtubules, which might be explained by the fact that tumour cells have a high growth rate thus the cytoskeleton is assembled over and over again. We also notice that angiogenesis is among the most enriched biological processes as we expected. In fact, angiogenesis is particularly important in tumorigenesis to allow the growth of the tumour tissue, providing nutrients to cells.

```
barplot(ego_BP_down, showCategory = 10)
```

We would expect most of these biological processes to be enriched in the up-regulated genes since tumour cells tend to replicate more than normal cells. A possible explanation is that tumour cells genes accumulate numerous mutations usually ending up in loss of function or downregulation. These mutations might occur on transcription factors binding sites or RNA binding sites, reducing their expression.

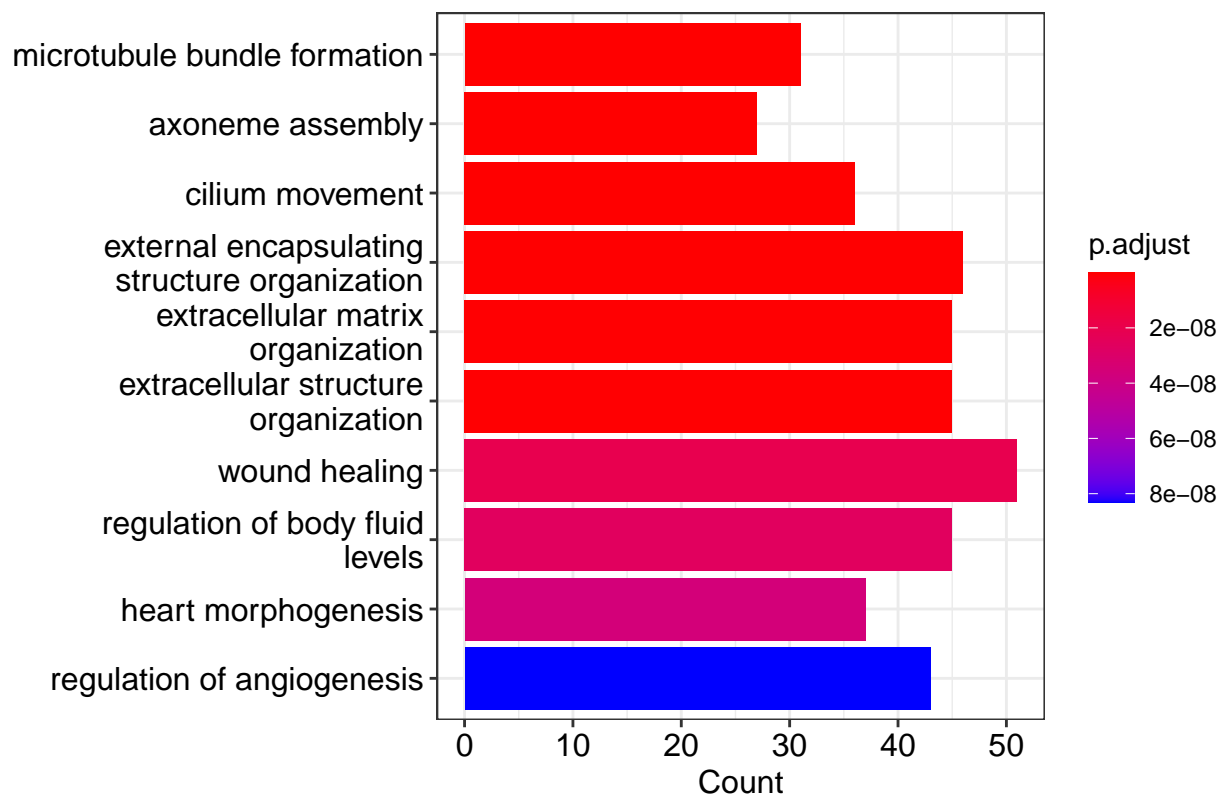


Figure 6: Biological process up regulated genes

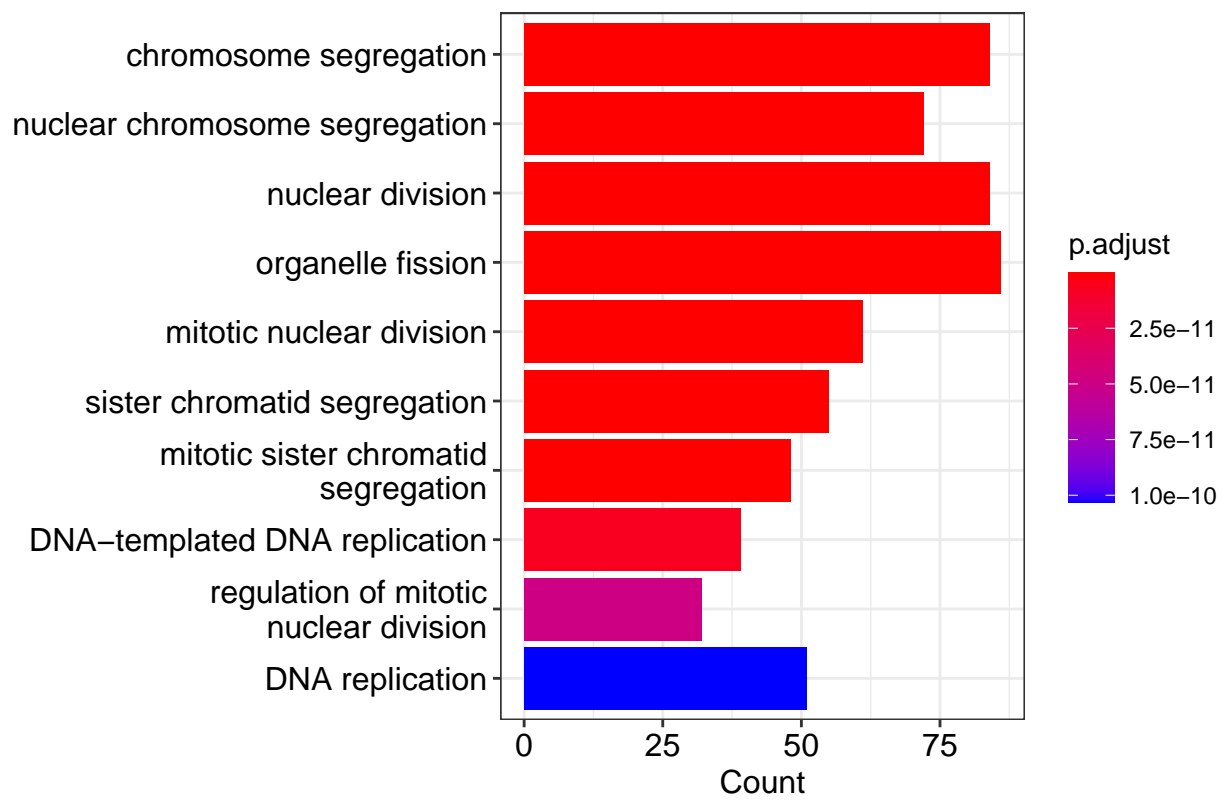


Figure 7: Biological process down regulated genes

## Performing enrichment analysis for GO molecular function

```
# molecular function up regulated genes
ego_MF_up <- enrichGO(gene = upDEGs$external_gene_name, OrgDb = org.Hs.eg.db, keyType = "SYMBOL",
  ont = "MF", pAdjustMethod = "BH", pvalueCutoff = 0.05, qvalueCutoff = 0.05)

# molecular function down regulated genes
ego_MF_down <- enrichGO(gene = downDEGs$external_gene_name, OrgDb = org.Hs.eg.db,
  keyType = "SYMBOL", ont = "MF", pAdjustMethod = "BH", pvalueCutoff = 0.05, qvalueCutoff = 0.05)

barplot(ego_MF_up, showCategory = 10)
```

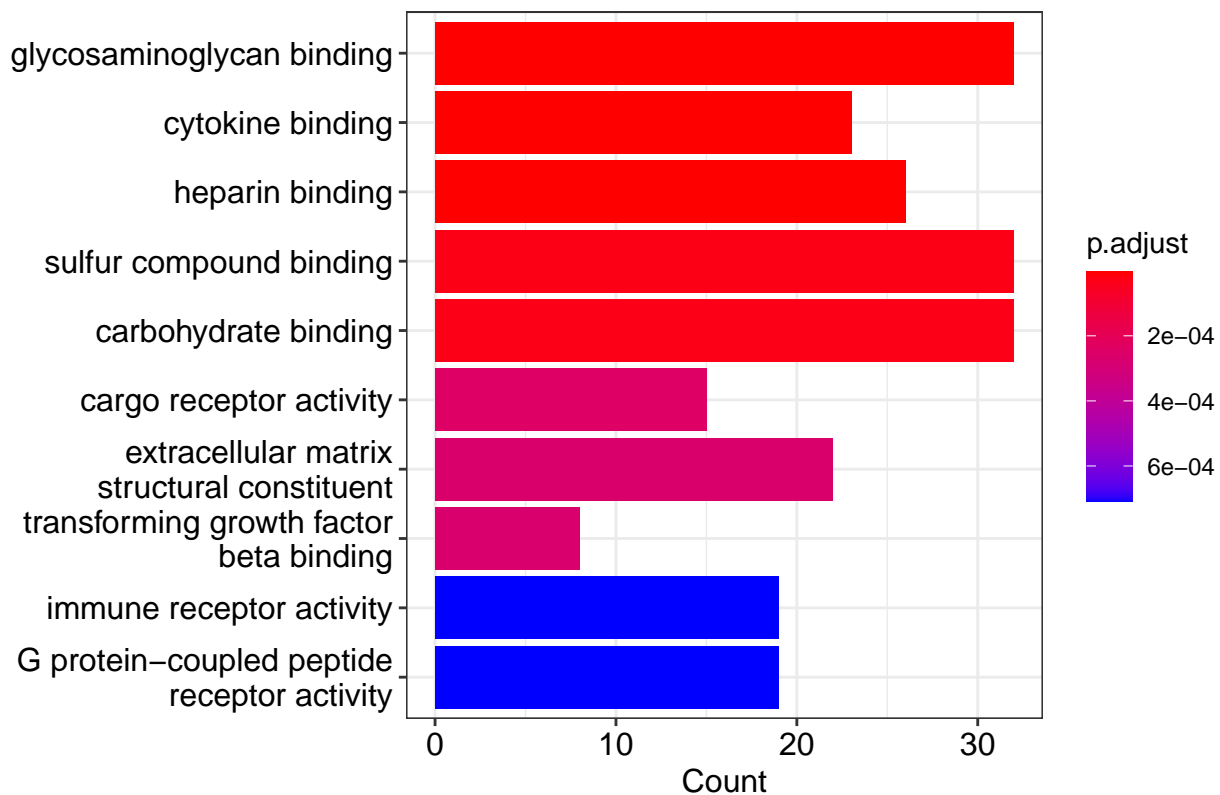


Figure 8: Molecular function up regulated genes

```
barplot(ego_MF_down, showCategory = 10)

eWP_up <- enrichWP(gene = upDEGs$entrezgene_id, organism = "Homo sapiens", pvalueCutoff = 0.05,
  qvalueCutoff = 0.1)

head(eWP_up, n = 10)
```

##	ID	Description
----	----	-------------

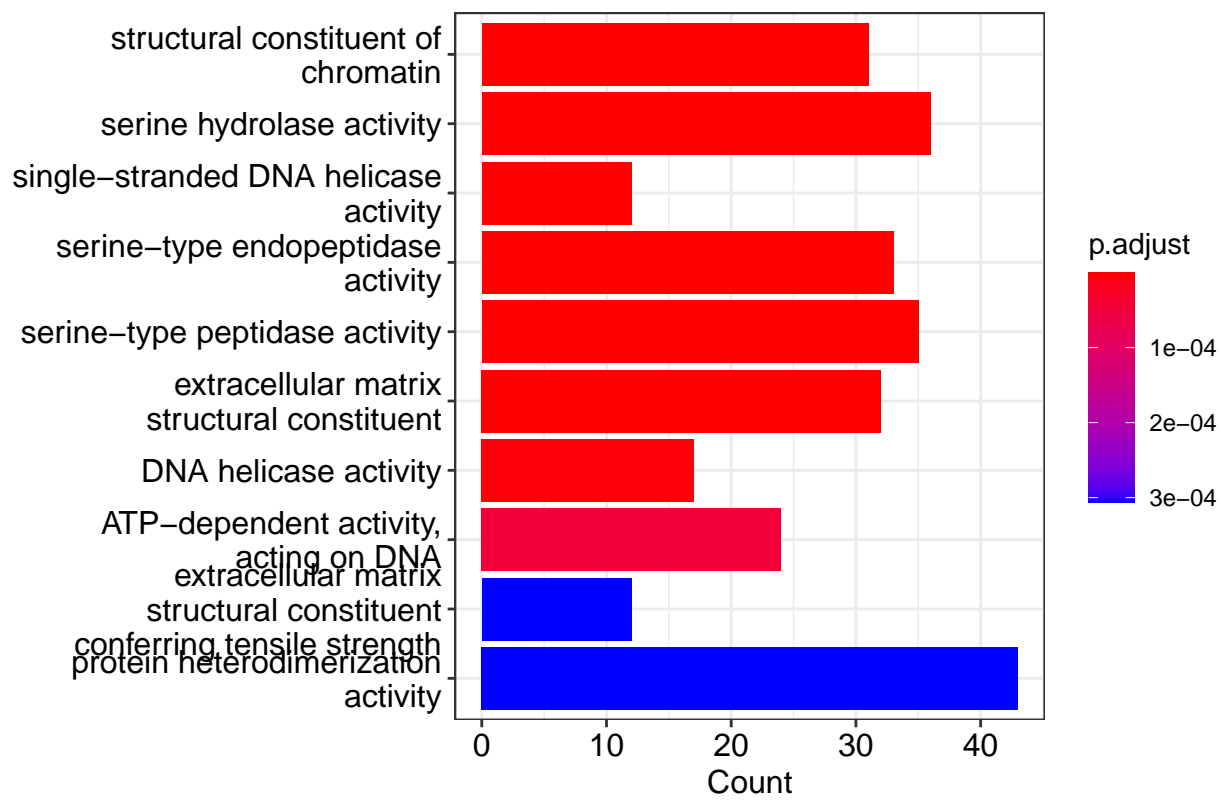


Figure 9: Molecular function down regulated genes

```

## WP2806 WP2806 Complement system
## WP545 WP545 Complement activation
## WP558 WP558 Complement and coagulation cascades
## WP2431 WP2431 Spinal cord injury
## WP5094 WP5094 Orexin receptor pathway
## WP5090 WP5090 Complement system in neuronal development and plasticity
## GeneRatio BgRatio pvalue p.adjust qvalue
## WP2806 19/436 97/8442 3.960197e-07 0.0001892974 0.0001725812
## WP545 8/436 23/8442 1.171095e-05 0.0027989174 0.0025517547
## WP558 12/436 58/8442 3.152788e-05 0.0050234421 0.0045798393
## WP2431 18/436 121/8442 4.427616e-05 0.0052910008 0.0048237708
## WP5094 24/436 201/8442 1.015995e-04 0.0087342052 0.0079629178
## WP5090 16/436 107/8442 1.096344e-04 0.0087342052 0.0079629178
##
## WP2806 6401/729/2219/2160/7448/6404/730/653509/22918/5199/5648/11326/5806/235
## WP545 732/729
## WP558 729/1361/7450/730/5648/713/
## WP2431 2920/4842/57556/6347/1958/3164/7538/3569/7099/9353/2353/361
## WP5094 6401/862/2920/4616/1839/8013/1958/1959/3164/2354/3949/5468/3569/9314/2890/1346/2353/5581/3400
## WP5090 732/729/2219/7448/730/5199/5648/8547/81035/1524
## Count
## WP2806 19
## WP545 8
## WP558 12
## WP2431 18
## WP5094 24
## WP5090 16

```

```

eWP_down <- enrichWP(gene = downDEGs$entrezgene_id, organism = "Homo sapiens", pvalueCutoff = 0.05,
  qvalueCutoff = 0.1)
head(eWP_down, n = 10)

```

```

## ID
## WP2446 WP2446
## WP2361 WP2361
## WP179 WP179
## WP1604 WP1604
## WP45 WP45
## WP466 WP466
## WP4240 WP4240
## WP698 WP698
## WP4016 WP4016
## WP2525 WP2525
##
## Description
## WP2446 Retinoblastoma gene in cancer
## WP2361 Gastric cancer network 1
## WP179 Cell cycle
## WP1604 Codeine and morphine metabolism
## WP45 G1 to S cell cycle control
## WP466 DNA replication
## WP4240 Regulation of sister chromatid separation at the metaphase-anaphase transition
## WP698 Glucuronidation
## WP4016 DNA IR-damage and cellular response via ATR

```

```

## WP2525 Trans-sulfuration, one-carbon metabolism and related pathways
## GeneRatio BgRatio pvalue p.adjust qvalue
## WP2446 26/618 90/8442 5.976882e-10 3.107978e-07 2.850029e-07
## WP2361 13/618 28/8442 2.054960e-08 4.361461e-06 3.999477e-06
## WP179 28/618 120/8442 2.516227e-08 4.361461e-06 3.999477e-06
## WP1604 9/618 16/8442 4.091055e-07 4.391632e-05 4.027145e-05
## WP45 18/618 64/8442 4.222724e-07 4.391632e-05 4.027145e-05
## WP466 13/618 42/8442 5.366172e-06 4.650682e-04 4.264694e-04
## WP4240 7/618 15/8442 4.168136e-05 3.096330e-03 2.839347e-03
## WP698 9/618 26/8442 5.735318e-05 3.541417e-03 3.247494e-03
## WP4016 17/618 81/8442 6.129375e-05 3.541417e-03 3.247494e-03
## WP2525 15/618 68/8442 9.059661e-05 4.711024e-03 4.320028e-03
##
## WP2446 1870/54443/4175/4998/24137/8318/5427/1869/4173/898/1871/7272/7153/891/10733/890/1111/9133/
## WP2361 6790/22974/4605/4173/1894/1063/71
## WP179 1870/4171/4175/4998/23594/8318/990/1869/4173/898/1871/7272/991/9088/891/9700/890/1029/1111/91
## WP1604 1244/1565/8
## WP45 1870/4171/4175/4998/23594/8318/5427/1869/4173/898/
## WP466 55388/4171/4175/4998/23594/83
## WP4240
## WP698 7358/7363/545
## WP4016 672/5888/4171/63967/8318/1869/2305/83990/55215
## WP2525 2729/2730/10797/1789/2571/23743/29968/570/5
## Count
## WP2446 26
## WP2361 13
## WP179 28
## WP1604 9
## WP45 18
## WP466 13
## WP4240 7
## WP698 9
## WP4016 17
## WP2525 15

```

Chiedere a Romanel per pathway.id (KEGG o WP)?

## Task 5: Visualization of the enriched pathway

```

logFC <- upDEGs$logFC
names(logFC) <- upDEGs$entrezgene_id
pathview(gene.data = logFC, pathway.id = "WP2446", species = "human")

eWP_KEGG <- enrichKEGG(gene = upDEGs$entrezgene_id, organism = "human", pvalueCutoff = 0.05,
  qvalueCutoff = 0.1)

head(eWP_KEGG, n = 20)

```

```

## ID Description
## hsa05144 hsa05144 Malaria
## hsa04610 hsa04610 Complement and coagulation cascades

```



##	hsa04270	hsa04270				Vascular smooth muscle contraction
##	hsa04061	hsa04061				Viral protein interaction with cytokine and cytokine receptor
##	hsa04614	hsa04614				Renin-angiotensin system
##	hsa03320	hsa03320				PPAR signaling pathway
##	hsa04380	hsa04380				Osteoclast differentiation
##	hsa04514	hsa04514				Cell adhesion molecules
##	hsa04060	hsa04060				Cytokine-cytokine receptor interaction
##	hsa04924	hsa04924				Renin secretion
##	hsa04080	hsa04080				Neuroactive ligand-receptor interaction
##	hsa04925	hsa04925				Aldosterone synthesis and secretion
##	hsa04976	hsa04976				Bile secretion
##		GeneRatio	BgRatio	pvalue	p.adjust	qvalue
##	hsa05144	13/382	50/8461	2.045971e-07	3.077765e-05	2.686624e-05
##	hsa04610	17/382	86/8461	2.144784e-07	3.077765e-05	2.686624e-05
##	hsa04270	17/382	134/8461	1.038943e-04	9.939223e-03	8.676086e-03
##	hsa04061	14/382	100/8461	1.469697e-04	1.054508e-02	9.204945e-03
##	hsa04614	6/382	23/8461	4.269912e-04	2.382406e-02	2.079635e-02
##	hsa03320	11/382	75/8461	4.980639e-04	2.382406e-02	2.079635e-02
##	hsa04380	15/382	128/8461	6.235812e-04	2.501803e-02	2.183859e-02
##	hsa04514	17/382	157/8461	6.973666e-04	2.501803e-02	2.183859e-02
##	hsa04060	26/382	295/8461	8.073811e-04	2.574649e-02	2.247447e-02
##	hsa04924	10/382	69/8461	9.796110e-04	2.811484e-02	2.454183e-02
##	hsa04080	30/382	367/8461	1.126599e-03	2.939399e-02	2.565843e-02
##	hsa04925	12/382	98/8461	1.460139e-03	3.492166e-02	3.048360e-02
##	hsa04976	11/382	89/8461	2.111646e-03	4.661864e-02	4.069406e-02
##						
##	hsa05144					6401/14000
##	hsa04610					732/729/1361/2160/7400
##	hsa04270					10203/1906/50487/10268/196883/102660
##	hsa04061					53832/2920/6369
##	hsa04614					
##	hsa03320					
##	hsa04380					7305/6688/10326/54/11000
##	hsa04514					6401/51208/8516/64115/6404/90952/58400
##	hsa04060					53832/2920/3568/6369/1440/6347/2690/3977/9173/8809/650/51554/3569/90865/90000
##	hsa04924					
##	hsa04080	153/10203/1906/1511/5023/2690/7433/1268/5737/8698/2922/187/1910/6751/185/2900/2890/5745/11200				
##	hsa04925					4
##	hsa04976					
##		Count				
##	hsa05144	13				
##	hsa04610	17				
##	hsa04270	17				
##	hsa04061	14				
##	hsa04614	6				
##	hsa03320	11				
##	hsa04380	15				
##	hsa04514	17				
##	hsa04060	26				
##	hsa04924	10				
##	hsa04080	30				
##	hsa04925	12				
##	hsa04976	11				

## Task 6: Enrichment score transcription factors

```
promoter_regions <- getSequence(id = downDEGs$ensembl_gene_id, type = "ensembl_gene_id",
  seqType = "gene_flank", upstream = 500, mart = ensembl)
```

```
data(PWMLogn.hg19.MotifDb.Hsap)
seq <- lapply(promoter_regions$gene_flank, function(x) DNASTring(x))
```

```
enriched_TFs = motifEnrichment(seq, PWMLogn.hg19.MotifDb.Hsap, score = "affinity")
```

```
## Calculating motif enrichment scores ...
```

```
report = groupReport(enriched_TFs)
report
```

```
## An object of class 'MotifEnrichmentReport':
##      rank target      id      raw.score      p.value
## 1      1  PGAM2      PGAM2 7.47058707343782 2.41159784654048e-86
## 2      2  TFAP4  M2944_1.02 3.42391273544219 3.36836197404242e-84
## 3      3   SP2      SP2 119.54842162525 6.25197615973972e-84
## 4      4  CEBPB  M4556_1.02 2.30767167521828 1.7054813305699e-83
## 5      5  JUND  M4506_1.02 6.8634137704217 1.50332672791467e-81
## 6      6  MAFK  M4573_1.02 2.41935358645508 4.83938302985492e-81
## 7      7  ZMAT2  ZMAT2 2.16420212862343 9.19698805317131e-81
## 8      8   JUN  M4591_1.02 2.76520576103839 2.36897498529839e-80
## 9      9  KLF5  KLF5 30.1023912345585 2.91297830264159e-79
## 10     10  NNT      NNT 1.87741003326598 6.17885793377267e-79
## ...      ...      ...      ...      ...
## 2287 2001.5 Oct-1 NBT06/Oct-1.pwm 1.72351938773035 1
##      top.motif.prop
## 1      0.177364864864865
## 2      0.178209459459459
## 3      0.185810810810811
## 4      0.174831081081081
## 5      0.185810810810811
## 6      0.171452702702703
## 7      0.163851351351351
## 8      0.168074324324324
## 9      0.158783783783784
## 10     0.173986486486486
## ...      ...
## 2287 0.0278716216216216
```

## Task 7

Select one among the top enriched TFs, compute the empirical distributions of scores for all PWMs that you find in MotifDB for the selected TF and determine for all of them the distribution (log2) threshold cutoff at 99.75%.

```
tfs <- report$target[1]

tfs_motifs = subset(MotifDb, organism == "Hsapiens" & geneSymbol == tfs)
# tfs_motifs

PWM = toPWM(as.list(tfs_motifs))
PWM

## $`Hsapiens-hPDI-PGAM2`
## An object of class 'PWM'
## ID: Hsapiens-hPDI-PGAM2
## Target name: Hsapiens-hPDI-PGAM2
## Frequency matrix:
## $pfm
##   1  2  3  4  5  6  7  8
## A  0  0  0 25  0 12 12  0
## C  0 12 12 25  0  0  0  0
## G 50 38 38  0 50 38 38 50
## T  0  0  0  0  0  0  0  0
## Position weight matrix (PWM):
## $pwm
##           1           2           3           4           5           6           7
## A -5.672425 -5.6724253 -5.6724253  0.9857861 -5.672425 -0.0577155 -0.0577155
## C -5.672425 -0.0577155 -0.0577155  0.9857861 -5.672425 -5.6724253 -5.6724253
## G  1.978626  1.5849625  1.5849625 -5.6724253  1.978626  1.5849625  1.5849625
## T -5.672425 -5.6724253 -5.6724253 -5.6724253 -5.672425 -5.6724253 -5.6724253
##           8
## A -5.672425
## C -5.672425
## G  1.978626
## T -5.672425
## With background nucleotide frequencies which also serve as pseudo-count:
## $prior.params
##   A   C   G   T
## 0.25 0.25 0.25 0.25
```

```
ecdf = motifEcdf(PWM, organism = "hg19", quick = TRUE) # calculate for each motif of my gene the empirical ecdf
# ecdf

thresholds = lapply(ecdf, function(x) log2(quantile(x, 0.9975))) # for each of the distribution, take thresholds
# thresholds
```

## Task 8

Identify which up-regulated (or down-regulated depending on the choice you made at point 7) genes have a region in their promoter (defined as previously) with binding scores above the computed thresholds for any of the previously selected PWMs. Use pattern matching as done during the course

```
scores = motifScores(seq, PWM, raw.scores = FALSE, cutoff = unlist(thresholds)) # in my promoters, i w
head(scores)
```

```
##      Hsapiens-hPDI-PGAM2
## [1,]                4
## [2,]                4
## [3,]                1
## [4,]                2
## [5,]                7
## [6,]                2
```

```
fractions_99_75 = c()
fractions_99_75 = c(fractions_99_75, length(which(apply(scores, 1, sum) > 0))/100)
fractions_99_75
```

```
## [1] 10.07
```

```
highscore_seq <- which(apply(scores, 1, sum) > 0)
down_DEGs[highscore_seq, ] # keeping only sequences which have higher score than threshold
```

##	ensembl_gene_id	external_gene_name	length	logFC	logCPM	
##	ENSG00000130234	ENSG00000130234	ACE2	112670	-1.500042	2.537010
##	ENSG00000139998	ENSG00000139998	RAB15	27412	-1.500270	5.323017
##	ENSG00000088826	ENSG00000088826	SMOX	66767	-1.503458	3.277682
##	ENSG00000240972	ENSG00000240972	MIF	844	-1.503544	7.546681
##	ENSG00000085465	ENSG00000085465	OVGP1	13416	-1.504675	1.551978
##	ENSG00000183196	ENSG00000183196	CHST6	23393	-1.506132	3.263537
##	ENSG00000121380	ENSG00000121380	BCL2L14	161240	-1.509102	1.183644
##	ENSG00000112312	ENSG00000112312	GMNN	11168	-1.509589	3.686536
##	ENSG00000064300	ENSG00000064300	NGFR	19715	-1.509766	2.645172
##	ENSG00000170779	ENSG00000170779	CDCA4	11510	-1.512081	3.782223
##	ENSG00000139835	ENSG00000139835	GRTP1	39985	-1.514213	3.059998
##	ENSG00000164171	ENSG00000164171	ITGA2	105439	-1.514961	6.213954
##	ENSG00000178852	ENSG00000178852	EFCAB13	118022	-1.516200	1.732368
##	ENSG00000137699	ENSG00000137699	TRIM29	74243	-1.516640	5.146690
##	ENSG00000100167	ENSG00000100167	SEPTIN3	28778	-1.519337	2.424322
##	ENSG00000137747	ENSG00000137747	TMPRSS13	28818	-1.520302	4.713471
##	ENSG00000185101	ENSG00000185101	ANO9	24078	-1.520674	4.414709
##	ENSG00000265690	ENSG00000265690		2430	-1.522722	2.289592
##	ENSG00000251357	ENSG00000251357		33035	-1.522779	6.898722
##	ENSG00000248485	ENSG00000248485	PCP4L1	26705	-1.522794	3.897882
##	ENSG00000212916	ENSG00000212916	MAP10	4513	-1.524873	1.849379
##	ENSG00000182199	ENSG00000182199	SHMT2	5362	-1.526742	6.142538
##	ENSG00000136295	ENSG00000136295	TTYH3	32841	-1.527712	6.694196
##	ENSG00000262660	ENSG00000262660		17168	-1.530243	5.628142
##	ENSG00000145908	ENSG00000145908	ZNF300	10591	-1.531791	2.317176
##	ENSG00000141682	ENSG00000141682	PMAIP1	4309	-1.531812	3.680478
##	ENSG00000104368	ENSG00000104368	PLAT	32991	-1.533091	6.679663
##	ENSG00000057294	ENSG00000057294	PKP2	106032	-1.535496	3.836982
##	ENSG00000183605	ENSG00000183605	SFXN4	24947	-1.536623	4.086809
##	ENSG00000112242	ENSG00000112242	E2F3	91835	-1.539108	4.420271
##	ENSG00000143578	ENSG00000143578	CREB3L4	6827	-1.540545	4.257557
##	ENSG00000160200	ENSG00000160200	CBS	23752	-1.541278	4.078383
##	ENSG00000161692	ENSG00000161692	DBF4B	43656	-1.541794	2.704834
##	ENSG00000198648	ENSG00000198648	STK39	293575	-1.541851	5.356302
##	ENSG00000176749	ENSG00000176749	CDK5R1	4260	-1.544475	1.888809

## ENSG00000167759	ENSG00000167759	KLK13	9488	-1.545001	1.376170
## ENSG00000163689	ENSG00000163689	CFAP20DC	332719	-1.546260	1.290553
## ENSG00000259207	ENSG00000259207	ITGB3	59916	-1.547201	3.544269
## ENSG00000159958	ENSG00000159958	TNFRSF13C	4774	-1.548716	1.919789
## ENSG00000078269	ENSG00000078269	SYNJ2	117313	-1.549474	4.320316
## ENSG00000205336	ENSG00000205336	ADGRG1	54928	-1.550081	7.077630
## ENSG00000065911	ENSG00000065911	MTHFD2	31393	-1.550408	5.930603
## ENSG00000131941	ENSG00000131941	RHPN2	86296	-1.552602	4.994363
## ENSG00000198743	ENSG00000198743	SLC5A3	32682	-1.556584	5.729588
## ENSG00000112559	ENSG00000112559	MDFI	17362	-1.557440	4.164127
## ENSG00000109654	ENSG00000109654	TRIM2	187156	-1.557838	6.443849
## ENSG00000164877	ENSG00000164877	MICALL2	31005	-1.558882	5.008547
## ENSG00000155974	ENSG00000155974	GRIP1	721731	-1.561022	1.417162
## ENSG00000112699	ENSG00000112699	GMDS	621799	-1.561800	4.391701
## ENSG00000159753	ENSG00000159753	CARMIL2	12581	-1.561935	2.336659
## ENSG00000204410	ENSG00000204410	MSH5	22999	-1.563964	3.241788
## ENSG00000143850	ENSG00000143850	PLEKHA6	158812	-1.565081	5.170103
## ENSG00000128039	ENSG00000128039	SRD5A3	26887	-1.565301	5.658470
## ENSG00000178343	ENSG00000178343	SHISA3	4999	-1.566492	3.644319
## ENSG00000113569	ENSG00000113569	NUP155	82969	-1.568674	5.361621
## ENSG00000153044	ENSG00000153044	CENPH	20783	-1.568678	2.533422
## ENSG00000086991	ENSG00000086991	NOX4	173834	-1.569285	2.046545
## ENSG00000136883	ENSG00000136883	KIF12	13166	-1.571670	2.767915
## ENSG00000162391	ENSG00000162391	FAM151A	14375	-1.572294	1.436993
## ENSG00000138018	ENSG00000138018	SELENOI	87338	-1.573746	5.508538
## ENSG00000203668	ENSG00000203668	CHML	11518	-1.573916	5.398477
## ENSG00000232434	ENSG00000232434	AJM1	6323	-1.576989	1.888029
## ENSG00000185033	ENSG00000185033	SEMA4B	69075	-1.577951	7.030599
## ENSG00000069764	ENSG00000069764	PLA2G10	21760	-1.578783	3.531953
## ENSG00000123213	ENSG00000123213	NLN	149520	-1.583338	4.702906
## ENSG00000261115	ENSG00000261115	TMEM178B	406316	-1.585155	1.977196
## ENSG00000170417	ENSG00000170417	TMEM182	282995	-1.585317	2.481047
## ENSG00000132436	ENSG00000132436	FIGNL1	98407	-1.585702	3.523938
## ENSG00000124813	ENSG00000124813	RUNX2	336192	-1.587013	3.536683
## ENSG00000139880	ENSG00000139880	CDH24	10476	-1.587873	3.140076
## ENSG00000198088	ENSG00000198088	NUP62CL	83006	-1.587874	1.244016
## ENSG00000104892	ENSG00000104892	KLC3	18086	-1.588140	2.533676
## ENSG00000173917	ENSG00000173917	HOXB2	4215	-1.588560	3.049117
## ENSG00000143845	ENSG00000143845	ETNK2	20982	-1.589736	3.314283
## ENSG00000076003	ENSG00000076003	MCM6	36817	-1.589848	5.216820
## ENSG00000123131	ENSG00000123131	PRDX4	22135	-1.589873	6.456921
## ENSG00000143179	ENSG00000143179	UCK2	84004	-1.590596	4.567539
## ENSG00000132329	ENSG00000132329	RAMP1	53213	-1.591557	3.900210
## ENSG00000243509	ENSG00000243509	TNFRSF6B	2032	-1.594019	3.100374
## ENSG00000197506	ENSG00000197506	SLC28A3	65301	-1.594022	2.327855
## ENSG00000133110	ENSG00000133110	POSTN	36261	-1.597107	7.452977
## ENSG00000259753	ENSG00000259753		90395	-1.597434	2.867014
## ENSG00000130649	ENSG00000130649	CYP2E1	40814	-1.597748	1.547884
## ENSG00000120334	ENSG00000120334	CENPL	25333	-1.598123	2.789177
## ENSG00000138182	ENSG00000138182	KIF20B	73349	-1.599807	3.505943
## ENSG00000140263	ENSG00000140263	SORD	54038	-1.600171	4.543541
## ENSG00000167103	ENSG00000167103	PIP5KL1	9904	-1.601125	2.582204
## ENSG00000164466	ENSG00000164466	SFXN1	52680	-1.604628	4.933393
## ENSG00000173137	ENSG00000173137	ADCK5	20141	-1.605181	3.059048

##	ENSG00000155792	ENSG00000155792	DEPTOR	177201	-1.606566	4.300060
##	ENSG00000161267	ENSG00000161267	BDH1	63540	-1.607779	4.019304
##	ENSG00000242110	ENSG00000242110	AMACR	21939	-1.608449	5.313321
##	ENSG00000196136	ENSG00000196136	SERPINA3	11671	-1.609010	6.684014
##	ENSG00000162073	ENSG00000162073	PAQR4	4214	-1.610444	4.422533
##	ENSG00000259075	ENSG00000259075	POC1B-GALNT4	6854	-1.610847	5.101249
##	ENSG00000243449	ENSG00000243449	C4orf48	1969	-1.610905	1.247054
##	ENSG00000086548	ENSG00000086548	CEACAM6	21234	-1.612033	10.345139
##	ENSG00000109881	ENSG00000109881	CCDC34	32407	-1.613544	3.125278
##	ENSG00000258839	ENSG00000258839	MC1R	8854	-1.614936	3.114489
##	ENSG00000075213	ENSG00000075213	SEMA3A	536947	-1.616992	3.790847
##	ENSG00000145545	ENSG00000145545	SRD5A1	40959	-1.617653	4.222884
##	ENSG00000273259	ENSG00000273259		32588	-1.619472	6.669098
##	ENSG00000198937	ENSG00000198937	CCDC167	16955	-1.621447	3.486574
##	ENSG00000125775	ENSG00000125775	SDCBP2	19230	-1.621667	4.117135
##	ENSG00000174938	ENSG00000174938	SEZ6L2	28391	-1.622972	5.860033
##	ENSG00000077264	ENSG00000077264	PAK3	283076	-1.624828	1.734596
##	ENSG00000278259	ENSG00000278259	MYO19	47799	-1.624985	5.214996
##	ENSG00000144120	ENSG00000144120	TMEM177	7340	-1.630031	2.828744
##	ENSG00000166428	ENSG00000166428	PLD4	13048	-1.631748	3.899638
##	ENSG00000105976	ENSG00000105976	MET	126181	-1.636003	7.934410
##	ENSG00000091129	ENSG00000091129	NRCAM	309094	-1.638354	3.854951
##	ENSG00000167702	ENSG00000167702	KIFC2	8159	-1.638881	4.161628
##	ENSG00000164087	ENSG00000164087	POC1A	79464	-1.639574	2.599371
##	ENSG00000166508	ENSG00000166508	MCM7	9212	-1.640390	6.635150
##	ENSG00000117122	ENSG00000117122	MFAP2	6130	-1.644966	4.511989
##	ENSG00000113296	ENSG00000113296	THBS4	91976	-1.648073	2.946677
##	ENSG00000161800	ENSG00000161800	RACGAP1	56213	-1.648103	4.610426
##	ENSG00000257594	ENSG00000257594	GALNT4	5384	-1.650028	5.106323
##	ENSG00000114455	ENSG00000114455	HHLA2	81756	-1.652739	3.694455
##	ENSG00000136881	ENSG00000136881	BAAT	31218	-1.653082	1.843507
##	ENSG00000133710	ENSG00000133710	SPINK5	111699	-1.653368	4.425006
##	ENSG00000133302	ENSG00000133302	SLF1	120767	-1.653608	3.579773
##	ENSG00000156738	ENSG00000156738	MS4A1	14906	-1.653857	3.194135
##	ENSG00000048462	ENSG00000048462	TNFRSF17	2858	-1.655170	1.054242
##	ENSG00000152669	ENSG00000152669	CCNO	2456	-1.655353	2.159665
##	ENSG00000136928	ENSG00000136928	GABBR2	420826	-1.657768	1.369475
##	ENSG00000183486	ENSG00000183486	MX2	47394	-1.658764	5.407462
##	ENSG00000117215	ENSG00000117215	PLA2G2D	7627	-1.660125	2.538527
##	ENSG00000134460	ENSG00000134460	IL2RA	51681	-1.661573	2.683285
##	ENSG00000284505	ENSG00000284505	LYNX1-SLURP2	13890	-1.661625	1.556809
##	ENSG00000049249	ENSG00000049249	TNFRSF9	27294	-1.662267	2.397052
##	ENSG00000133962	ENSG00000133962	CATSPERB	200011	-1.664955	2.204809
##	ENSG00000050344	ENSG00000050344	NFE2L3	34939	-1.666688	5.087323
##	ENSG00000204681	ENSG00000204681	GABBR1	78347	-1.670810	6.053908
##	ENSG00000180198	ENSG00000180198	RCC1	33357	-1.671017	5.347353
##	ENSG00000173207	ENSG00000173207	CKS1B	4598	-1.674507	3.873388
##	ENSG00000134285	ENSG00000134285	FKBP11	4956	-1.674800	4.994151
##	ENSG00000261236	ENSG00000261236	BOP1	29393	-1.674908	5.190988
##	ENSG00000143630	ENSG00000143630	HCN3	12385	-1.675806	1.997056
##	ENSG00000203814	ENSG00000203814	H2BC18	29684	-1.677643	2.206070
##	ENSG00000160072	ENSG00000160072	ATAD3B	26083	-1.678884	4.510528
##	ENSG00000265817	ENSG00000265817	FSBP	58575	-1.683251	2.020709
##	ENSG00000152256	ENSG00000152256	PDK1	53296	-1.683360	4.362333

## ENSG00000164379	ENSG00000164379	FOXQ1	2660	-1.684285	4.667092
## ENSG00000101412	ENSG00000101412	E2F1	10908	-1.684535	3.975675
## ENSG00000164237	ENSG00000164237	CMBL	32027	-1.690178	5.482579
## ENSG00000203760	ENSG00000203760	CENPW	8760	-1.690218	2.252028
## ENSG00000013573	ENSG00000013573	DDX11	30939	-1.690692	4.421889
## ENSG00000022556	ENSG00000022556	NLRP2	48012	-1.691743	4.583769
## ENSG00000115758	ENSG00000115758	ODC1	8359	-1.691854	8.045807
## ENSG00000049768	ENSG00000049768	FOXP3	14362	-1.691996	1.881087
## ENSG00000101463	ENSG00000101463	SYNDIG1	196987	-1.694317	1.071526
## ENSG00000101825	ENSG00000101825	MXRA5	38087	-1.695109	6.500404
## ENSG00000165568	ENSG00000165568	AKR1E2	61433	-1.698689	1.394481
## ENSG00000137261	ENSG00000137261	KIAA0319	102087	-1.700917	2.922126
## ENSG00000104833	ENSG00000104833	TUBB4A	8529	-1.701652	2.163941
## ENSG00000277363	ENSG00000277363	SRCIN1	75921	-1.701875	3.073811
## ENSG00000273604	ENSG00000273604	EPOP	3254	-1.704322	2.641658
## ENSG00000157766	ENSG00000157766	ACAN	71917	-1.705638	1.337779
## ENSG00000083454	ENSG00000083454	P2RX5	24041	-1.707927	1.531765
## ENSG00000149418	ENSG00000149418	ST14	50580	-1.710525	7.774519
## ENSG00000161682	ENSG00000161682	FAM171A2	10638	-1.715000	1.611697
## ENSG00000196407	ENSG00000196407	THEM5	6611	-1.715115	1.012396
## ENSG00000121039	ENSG00000121039	RDH10	30679	-1.717458	6.653042
## ENSG00000197275	ENSG00000197275	RAD54B	103155	-1.721863	2.217730
## ENSG00000109586	ENSG00000109586	GALNT7	155156	-1.722498	5.746453
## ENSG00000108984	ENSG00000108984	MAP2K6	139168	-1.723137	2.691322
## ENSG00000132185	ENSG00000132185	FCRLA	7380	-1.725333	1.339935
## ENSG00000110777	ENSG00000110777	POU2AF1	103375	-1.729319	3.839083
## ENSG00000108773	ENSG00000108773	KAT2A	8256	-1.729358	5.498152
## ENSG00000149256	ENSG00000149256	TENM4	788201	-1.729778	3.343476
## ENSG00000169241	ENSG00000169241	SLC50A1	3513	-1.731314	6.030603
## ENSG00000204128	ENSG00000204128	C2orf72	12196	-1.734724	1.622162
## ENSG00000093217	ENSG00000093217	XYLB	74588	-1.736047	1.957556
## ENSG00000157193	ENSG00000157193	LRP8	86105	-1.736378	4.145203
## ENSG00000136457	ENSG00000136457	CHAD	4410	-1.737867	1.587856
## ENSG00000146858	ENSG00000146858	ZC3HAV1L	10336	-1.737916	1.589828
## ENSG00000134317	ENSG00000134317	GRHL1	50584	-1.739115	4.058031
## ENSG00000160973	ENSG00000160973	FOXH1	2437	-1.739826	2.969832
## ENSG00000169851	ENSG00000169851	PCDH7	426436	-1.740245	4.255273
## ENSG00000175928	ENSG00000175928	LRRN1	50403	-1.741763	3.344875
## ENSG00000008735	ENSG00000008735	MAPK8IP2	13188	-1.742225	2.918636
## ENSG00000110660	ENSG00000110660	SLC35F2	137302	-1.743251	5.015075
## ENSG00000116191	ENSG00000116191	RALGPS2	196677	-1.743838	4.480689
## ENSG00000171163	ENSG00000171163	ZNF692	9138	-1.746126	4.296615
## ENSG00000101255	ENSG00000101255	TRIB3	34724	-1.750142	4.957003
## ENSG00000146242	ENSG00000146242	TPBG	4214	-1.751586	4.817769
## ENSG00000096063	ENSG00000096063	SRPK1	88376	-1.752315	6.004781
## ENSG00000175305	ENSG00000175305	CCNE2	16908	-1.752788	2.991552
## ENSG00000124787	ENSG00000124787	RPP40	9346	-1.755257	2.117069
## ENSG00000125885	ENSG00000125885	MCM8	48325	-1.756684	3.735358
## ENSG00000115457	ENSG00000115457	IGFBP2	31608	-1.760474	7.207768
## ENSG00000205560	ENSG00000205560	CPT1B	9604	-1.762262	3.790908
## ENSG00000146410	ENSG00000146410	MTRFR2	19311	-1.762870	1.528495
## ENSG00000004848	ENSG00000004848	ARX	12726	-1.763523	1.357897
## ENSG00000138336	ENSG00000138336	TET1	134150	-1.765678	1.339211
## ENSG00000175352	ENSG00000175352	NRIP3	39606	-1.766966	2.467949

##	ENSG00000273294	ENSG00000273294	C1QTNF3-AMACR	137354	-1.768046	5.422504
##	ENSG00000185090	ENSG00000185090	MANEAL	7290	-1.768959	3.758475
##	ENSG00000197520	ENSG00000197520	FAM177B	13802	-1.774952	1.293268
##	ENSG00000106278	ENSG00000106278	PTPRZ1	188947	-1.778902	2.470866
##	ENSG00000196793	ENSG00000196793	ZNF239	18274	-1.780237	2.023576
##	ENSG00000013810	ENSG00000013810	TACC3	32313	-1.786897	4.983556
##	ENSG00000119888	ENSG00000119888	EPCAM	42443	-1.788007	8.157854
##	ENSG00000104951	ENSG00000104951	IL4I1	39885	-1.788851	3.980566
##	ENSG00000054938	ENSG00000054938	CHRD12	34997	-1.792078	1.719510
##	ENSG00000059573	ENSG00000059573	ALDH18A1	50770	-1.794549	6.251501
##	ENSG00000187840	ENSG00000187840	EIF4EBP1	29831	-1.796222	4.945152
##	ENSG00000012048	ENSG00000012048	BRCA1	125950	-1.797129	3.739767
##	ENSG00000073605	ENSG00000073605	GSDMB	15259	-1.799711	4.017249
##	ENSG00000101443	ENSG00000101443	WFDC2	11779	-1.803749	7.872880
##	ENSG00000023909	ENSG00000023909	GCLM	24257	-1.804110	5.775348
##	ENSG00000120322	ENSG00000120322	PCDHB8	2749	-1.807539	1.695113
##	ENSG00000175600	ENSG00000175600	SUGCT	725758	-1.808125	1.295198
##	ENSG00000278318	ENSG00000278318	ZNF229	31059	-1.809405	2.430501
##	ENSG00000110400	ENSG00000110400	NECTIN1	105792	-1.809407	5.267925
##	ENSG00000108582	ENSG00000108582	CPD	91062	-1.811439	8.160165
##	ENSG00000108106	ENSG00000108106	UBE2S	8043	-1.813968	3.354238
##	ENSG00000046604	ENSG00000046604	DSG2	50831	-1.816004	7.377496
##	ENSG00000167157	ENSG00000167157	PRRX2	57027	-1.823001	1.533004
##	ENSG00000164825	ENSG00000164825	DEFB1	7344	-1.823813	2.570079
##	ENSG00000154102	ENSG00000154102	C16orf74	61045	-1.824213	1.557636
##	ENSG00000157470	ENSG00000157470	FAM81A	150862	-1.825138	1.968674
##	ENSG00000196550	ENSG00000196550	FAM72A	18235	-1.826073	1.451424
##	ENSG00000197753	ENSG00000197753	LHFPL5	48191	-1.828088	2.489344
##	ENSG00000163013	ENSG00000163013	FBXO41	29796	-1.828114	3.237355
##	ENSG00000054179	ENSG00000054179	ENTPD2	5954	-1.834941	1.134448
##	ENSG00000150551	ENSG00000150551	LYPD1	28293	-1.841166	4.254612
##	ENSG00000176890	ENSG00000176890	TYMS	15925	-1.848305	4.349043
##	ENSG00000153132	ENSG00000153132	CLGN	39208	-1.849582	2.067144
##	ENSG00000134013	ENSG00000134013	LOXL2	128431	-1.850898	5.358910
##	ENSG00000149380	ENSG00000149380	P4HA3	75839	-1.853312	2.494591
##	ENSG00000178222	ENSG00000178222	RNF212	57314	-1.858671	2.915865
##	ENSG00000172382	ENSG00000172382	PRSS27	8132	-1.860121	1.238259
##	ENSG00000111640	ENSG00000111640	GAPDH	3862	-1.861049	10.401961
##	ENSG00000170927	ENSG00000170927	PKHD1	472314	-1.862670	1.051350
##	ENSG00000149328	ENSG00000149328	GLB1L2	46467	-1.862786	5.003440
##	ENSG00000151640	ENSG00000151640	DPYSL4	18811	-1.864471	1.031490
##	ENSG00000105369	ENSG00000105369	CD79A	4093	-1.864822	4.112106
##	ENSG00000197893	ENSG00000197893	NRAP	75356	-1.865932	1.145252
##	ENSG00000157214	ENSG00000157214	STEAP2	70547	-1.866029	4.886553
##	ENSG00000088882	ENSG00000088882	CPXM1	6553	-1.867704	3.129308
##	ENSG00000124766	ENSG00000124766	SOX4	4868	-1.874498	7.387662
##	ENSG00000160606	ENSG00000160606	TLCD1	3587	-1.874799	3.764146
##	ENSG00000163462	ENSG00000163462	TRIM46	11184	-1.877718	1.695224
##	ENSG00000197261	ENSG00000197261	C6orf141	11241	-1.879500	1.394283
##	ENSG00000115255	ENSG00000115255	REEP6	6761	-1.885927	3.317611
##	ENSG00000249992	ENSG00000249992	TMEM158	1821	-1.889140	1.597508
##	ENSG00000158477	ENSG00000158477	CD1A	3845	-1.889493	2.685613
##	ENSG00000198431	ENSG00000198431	TXNRD1	134528	-1.897356	8.258793
##	ENSG00000130762	ENSG00000130762	ARHGEF16	26448	-1.899233	4.664313



##	ENSG00000176208	ENSG00000176208	ATAD5	63903	-1.902364	2.494292
##	ENSG00000177455	ENSG00000177455	CD19	7377	-1.909583	1.483490
##	ENSG00000160211	ENSG00000160211	G6PD	29747	-1.909709	7.333756
##	ENSG00000142552	ENSG00000142552	RCN3	18959	-1.911109	4.874318
##	ENSG00000079385	ENSG00000079385	CEACAM1	53930	-1.919616	4.988726
##	ENSG00000108551	ENSG00000108551	RASD1	1958	-1.920271	6.148345
##	ENSG00000115226	ENSG00000115226	FNDC4	3317	-1.928155	3.057992
##	ENSG00000198286	ENSG00000198286	CARD11	138086	-1.930466	4.247612
##	ENSG00000038427	ENSG00000038427	VCAN	110685	-1.931846	7.585942
##	ENSG00000113368	ENSG00000113368	LMNB1	60397	-1.932953	4.825433
##	ENSG00000170476	ENSG00000170476	MZB1	2614	-1.934722	4.523787
##	ENSG00000139629	ENSG00000139629	GALNT6	41620	-1.935838	5.578761
##	ENSG00000151725	ENSG00000151725	CENPU	40045	-1.936376	3.276397
##	ENSG00000128050	ENSG00000128050	PAICS	28837	-1.938668	6.249635
##	ENSG00000006118	ENSG00000006118	TMEM132A	12699	-1.939330	5.255316
##	ENSG00000182704	ENSG00000182704	TSKU	15902	-1.939570	5.735547
##	ENSG00000143476	ENSG00000143476	DTL	71847	-1.942568	3.369201
##	ENSG00000143324	ENSG00000143324	XPR1	258257	-1.943102	6.722636
##	ENSG00000134762	ENSG00000134762	DSC3	53450	-1.944976	2.633579
##	ENSG00000116031	ENSG00000116031	CD207	5605	-1.948585	3.259459
##	ENSG00000156802	ENSG00000156802	ATAD2	96500	-1.950653	4.955933
##	ENSG00000215788	ENSG00000215788	TNFRSF25	5389	-1.955292	3.116672
##	ENSG00000099958	ENSG00000099958	DERL3	4625	-1.958905	4.349987
##	ENSG00000198554	ENSG00000198554	WDHD1	88156	-1.960519	3.447534
##	ENSG00000064195	ENSG00000064195	DLX3	5219	-1.969722	1.057694
##	ENSG00000185100	ENSG00000185100	ADSS1	23096	-1.972535	3.624267
##	ENSG00000163535	ENSG00000163535	SGO2	74088	-1.972778	3.102364
##	ENSG00000070526	ENSG00000070526	ST6GALNAC1	19025	-1.972884	5.387686
##	ENSG00000081277	ENSG00000081277	PKP1	49541	-1.974033	4.328610
##	ENSG00000102878	ENSG00000102878	HSF4	5264	-1.974452	3.780568
##	ENSG00000100625	ENSG00000100625	SIX4	14812	-1.979854	3.490240
##	ENSG00000165215	ENSG00000165215	CLDN3	1273	-1.981511	5.767411
##	ENSG00000188158	ENSG00000188158	NHS	360794	-1.985858	3.502026
##	ENSG00000105929	ENSG00000105929	ATP6VOA4	93266	-1.986274	2.658488
##	ENSG00000128059	ENSG00000128059	PPAT	42253	-1.986512	3.674743
##	ENSG00000005001	ENSG00000005001	PRSS22	5440	-1.986958	4.427414
##	ENSG00000127586	ENSG00000127586	CHTF18	12691	-1.988197	3.549299
##	ENSG00000259316	ENSG00000259316		200260	-1.989321	3.233405
##	ENSG00000168528	ENSG00000168528	SERINC2	25115	-1.990047	6.856713
##	ENSG00000143546	ENSG00000143546	S100A8	1041	-1.991343	6.919843
##	ENSG00000148702	ENSG00000148702	HABP2	38765	-1.992397	3.894193
##	ENSG00000130635	ENSG00000130635	COL5A1	203040	-1.992603	7.642546
##	ENSG00000111602	ENSG00000111602	TIMELESS	33063	-1.997437	5.030255
##	ENSG00000130487	ENSG00000130487	KLHDC7B	5124	-1.999128	2.104644
##	ENSG00000183734	ENSG00000183734	ASCL2	2090	-2.002411	1.552580
##	ENSG00000136982	ENSG00000136982	DSCC1	21918	-2.003744	2.396199
##	ENSG00000172818	ENSG00000172818	OVOL1	10151	-2.004506	1.914874
##	ENSG00000159259	ENSG00000159259	CHAF1B	33623	-2.006542	2.996009
##	ENSG00000243649	ENSG00000243649	CFB	6436	-2.007530	7.380655
##	ENSG00000049089	ENSG00000049089	COL9A2	17324	-2.009945	4.147554
##	ENSG00000100162	ENSG00000100162	CENPM	8415	-2.011852	2.459832
##	ENSG00000127129	ENSG00000127129	EDN2	5908	-2.015445	1.975905
##	ENSG00000146918	ENSG00000146918	NCAPG2	73635	-2.025210	4.413683
##	ENSG00000127324	ENSG00000127324	TSPAN8	316813	-2.026558	5.780040

## ENSG00000150201	ENSG00000150201	FXD4	4699	-2.026670	1.262867
## ENSG00000159166	ENSG00000159166	LAD1	19082	-2.026693	6.555750
## ENSG00000165434	ENSG00000165434	PGM2L1	68117	-2.028124	4.870415
## ENSG00000132704	ENSG00000132704	FCRL2	31399	-2.030447	1.254910
## ENSG00000272398	ENSG00000272398	CD24	5796	-2.037344	8.264384
## ENSG00000176788	ENSG00000176788	BASP1	211245	-2.042538	5.932803
## ENSG00000163220	ENSG00000163220	S100A9	3169	-2.046417	8.516750
## ENSG00000007062	ENSG00000007062	PROM1	121302	-2.048300	5.039263
## ENSG00000155660	ENSG00000155660	PDIA4	25600	-2.048460	8.408391
## ENSG00000181649	ENSG00000181649	PHLDA2	1147	-2.050653	3.936529
## ENSG00000183248	ENSG00000183248	PRR36	5671	-2.052117	3.922704
## ENSG00000135245	ENSG00000135245	HILPDA	2569	-2.056327	4.563053
## ENSG00000157833	ENSG00000157833	GAREM2	16575	-2.057197	2.546402
## ENSG00000088836	ENSG00000088836	SLC4A11	12142	-2.058858	2.933009
## ENSG00000187837	ENSG00000187837	H1-2	730	-2.066851	5.353368
## ENSG00000151715	ENSG00000151715	TMEM45B	44155	-2.067222	5.310904
## ENSG00000132821	ENSG00000132821	VSTM2L	42239	-2.069459	5.462258
## ENSG00000142102	ENSG00000142102	PGGHG	6981	-2.069811	6.657333
## ENSG00000197714	ENSG00000197714	ZNF460	14018	-2.070836	2.460722
## ENSG00000172244	ENSG00000172244	C5orf34	28439	-2.071198	1.239768
## ENSG00000150556	ENSG00000150556	LYPD6B	177155	-2.071602	2.093762
## ENSG00000129910	ENSG00000129910	CDH15	23744	-2.079954	1.333261
## ENSG00000146530	ENSG00000146530	VWDE	73056	-2.080167	1.292765
## ENSG00000067057	ENSG00000067057	PFKP	71385	-2.085223	6.514686
## ENSG00000087085	ENSG00000087085	ACHE	6980	-2.086546	2.939225
## ENSG00000135318	ENSG00000135318	NT5E	46207	-2.091160	5.713722
## ENSG00000003249	ENSG00000003249	DBNDD1	15019	-2.094944	4.397734
## ENSG00000139572	ENSG00000139572	GPR84	2042	-2.095907	1.105338
## ENSG00000088305	ENSG00000088305	DNMT3B	46974	-2.097433	2.068248
## ENSG00000127564	ENSG00000127564	PKMYT1	12455	-2.098741	4.264206
## ENSG00000172061	ENSG00000172061	LRRC15	14494	-2.107254	3.921425
## ENSG00000130768	ENSG00000130768	SMPDL3B	24157	-2.108776	5.556817
## ENSG00000111432	ENSG00000111432	FZD10	3281	-2.108849	2.352386
## ENSG00000064787	ENSG00000064787	BCAS1	133817	-2.112804	4.100816
## ENSG00000015413	ENSG00000015413	DPEP1	25148	-2.114444	1.492187
## ENSG00000135925	ENSG00000135925	WNT10A	18729	-2.119272	2.189618
## ENSG00000156510	ENSG00000156510	HKDC1	47220	-2.119668	4.199925
## ENSG00000182481	ENSG00000182481	KPNA2	11728	-2.124549	6.119194
## ENSG00000100197	ENSG00000100197	CYP2D6	4366	-2.126410	1.323234
## ENSG00000134339	ENSG00000134339	SAA2	9445	-2.127999	3.693123
## ENSG00000165376	ENSG00000165376	CLDN2	30697	-2.128932	4.111664
## ENSG00000197930	ENSG00000197930	ERO1A	55985	-2.130730	7.303846
## ENSG00000255071	ENSG00000255071	SAA2-SAA4	17212	-2.131439	3.181880
## ENSG00000104415	ENSG00000104415	CCN4	40651	-2.133259	3.176720
## ENSG00000187017	ENSG00000187017	ESPN	36591	-2.135018	3.133739
## ENSG00000132429	ENSG00000132429	POPDC3	22114	-2.146183	1.266327
## ENSG00000130821	ENSG00000130821	SLC6A8	8662	-2.148183	4.949765
## ENSG00000130701	ENSG00000130701	RBBP8NL	17302	-2.149420	1.620347
## ENSG00000258472	ENSG00000258472		34173	-2.154009	2.386299
## ENSG00000070669	ENSG00000070669	ASNS	20865	-2.157542	5.000286
## ENSG00000179750	ENSG00000179750	APOBEC3B	10457	-2.159154	2.830821
## ENSG00000162063	ENSG00000162063	CCNF	29460	-2.160757	3.634546
## ENSG00000174607	ENSG00000174607	UGT8	79455	-2.161026	3.137778
## ENSG00000187045	ENSG00000187045	TPRSS6	44277	-2.161504	2.735857

## ENSG00000008323	ENSG00000008323	PLEKHG6	18070	-2.162034	3.380238
## ENSG00000141756	ENSG00000141756	FKBP10	10533	-2.164932	6.750477
## ENSG00000186891	ENSG00000186891	TNFRSF18	3084	-2.165009	1.711805
## ENSG00000221947	ENSG00000221947	XKR9	121032	-2.170271	1.374779
## ENSG00000146674	ENSG00000146674	IGFBP3	9629	-2.170701	7.742610
## ENSG00000101104	ENSG00000101104	PABPC1L	48975	-2.171322	4.310482
## ENSG00000159231	ENSG00000159231	CBR3	11483	-2.172762	3.505358
## ENSG00000204839	ENSG00000204839	MROH6	6580	-2.173842	4.433743
## ENSG00000149260	ENSG00000149260	CAPN5	59194	-2.178721	5.262647
## ENSG00000248144	ENSG00000248144	ADH1C	16249	-2.179182	4.681944
## ENSG00000067715	ENSG00000067715	SYT1	588015	-2.181755	3.051088
## ENSG00000176490	ENSG00000176490	DIRAS1	6805	-2.182534	1.489622
## ENSG00000064655	ENSG00000064655	EYA2	294220	-2.185292	3.712686
## ENSG00000183048	ENSG00000183048	SLC25A10	8780	-2.192532	4.649826
## ENSG00000269404	ENSG00000269404	SPIB	12376	-2.192882	2.772922
## ENSG00000156804	ENSG00000156804	FBX032	43317	-2.198581	5.341722
## ENSG00000243364	ENSG00000243364	EFNA4	5816	-2.201471	3.550957
## ENSG00000170775	ENSG00000170775	GPR37	21907	-2.205812	1.564045
## ENSG00000145247	ENSG00000145247	OCIAD2	21918	-2.208730	6.031129
## ENSG00000120875	ENSG00000120875	DUSP4	17620	-2.210958	5.773439
## ENSG00000146205	ENSG00000146205	ANO7	37467	-2.215911	1.300613
## ENSG00000042980	ENSG00000042980	ADAM28	64945	-2.222007	4.233411
## ENSG00000267881	ENSG00000267881		48080	-2.223203	6.764622
## ENSG00000160949	ENSG00000160949	TONSL	15665	-2.225284	3.709890
## ENSG00000163362	ENSG00000163362	INAVA	24694	-2.227553	5.234919
## ENSG00000188107	ENSG00000188107	EYS	1987246	-2.230355	2.637099
## ENSG00000196632	ENSG00000196632	WNK3	165819	-2.230570	1.334145
## ENSG00000165238	ENSG00000165238	WNK2	136450	-2.238286	3.249538
## ENSG00000254709	ENSG00000254709	IGLL5	8331	-2.241573	8.523456
## ENSG00000151224	ENSG00000151224	MAT1A	17838	-2.242043	1.586409
## ENSG00000185156	ENSG00000185156	MFSD6L	2255	-2.247915	1.883889
## ENSG00000145194	ENSG00000145194	ECE2	17020	-2.254212	3.057176
## ENSG00000164694	ENSG00000164694	FNDC1	102708	-2.254758	4.479725
## ENSG00000169750	ENSG00000169750	RAC3	2526	-2.255113	2.981547
## ENSG00000169962	ENSG00000169962	TAS1R3	4034	-2.258085	1.570964
## ENSG00000034053	ENSG00000034053	APBA2	233832	-2.258649	3.731438
## ENSG00000204262	ENSG00000204262	COL5A2	193414	-2.259498	7.058538
## ENSG00000239672	ENSG00000239672	NME1	8869	-2.260837	5.986144
## ENSG00000137968	ENSG00000137968	SLC44A5	408985	-2.261264	2.762578
## ENSG00000152952	ENSG00000152952	PLOD2	128586	-2.265242	6.422950
## ENSG00000275004	ENSG00000275004	ZNF280B	24321	-2.265788	1.422604
## ENSG00000106236	ENSG00000106236	NPTX2	12584	-2.266073	2.064478
## ENSG00000138615	ENSG00000138615	CILP	16713	-2.272917	3.561680
## ENSG00000163507	ENSG00000163507	CIP2A	39780	-2.278245	2.754639
## ENSG00000185842	ENSG00000185842	DNAH14	503030	-2.281906	2.836351
## ENSG00000196074	ENSG00000196074	SYCP2	70091	-2.282057	2.406560
## ENSG00000101134	ENSG00000101134	DOK5	175576	-2.290524	1.100899
## ENSG00000228278	ENSG00000228278	ORM2	3382	-2.291331	3.193127
## ENSG00000213886	ENSG00000213886	UBD	4217	-2.296003	5.609216
## ENSG00000135100	ENSG00000135100	HNF1A	23969	-2.298595	1.581782
## ENSG00000164611	ENSG00000164611	PTTG1	6884	-2.298996	3.370191
## ENSG00000188368	ENSG00000188368	PRR19	8716	-2.300789	2.570544
## ENSG00000166823	ENSG00000166823	MESP1	1374	-2.306625	1.265961
## ENSG00000123219	ENSG00000123219	CENPK	45402	-2.307726	2.041031

##	ENSG00000260027	ENSG00000260027	HOXB7	26340	-2.308757	2.946047
##	ENSG00000145536	ENSG00000145536	ADAMTS16	179974	-2.317426	2.007242
##	ENSG00000135127	ENSG00000135127	BICDL1	105258	-2.319895	4.062893
##	ENSG00000171124	ENSG00000171124	FUT3	8583	-2.320585	4.263981
##	ENSG00000153292	ENSG00000153292	ADGRF1	44642	-2.322786	5.513732
##	ENSG00000105131	ENSG00000105131	EPHX3	6516	-2.327982	3.428141
##	ENSG00000137285	ENSG00000137285	TUBB2B	8406	-2.331551	4.415349
##	ENSG00000105737	ENSG00000105737	GRIK5	71885	-2.333123	1.177838
##	ENSG00000079462	ENSG00000079462	PAFAH1B3	6513	-2.333287	4.565077
##	ENSG00000115657	ENSG00000115657	ABCB6	9222	-2.333551	4.933288
##	ENSG00000115641	ENSG00000115641	FHL2	80801	-2.334354	5.313287
##	ENSG00000177679	ENSG00000177679	SRRM3	85392	-2.337903	1.444825
##	ENSG00000183091	ENSG00000183091	NEB	249151	-2.338852	2.415866
##	ENSG00000073111	ENSG00000073111	MCM2	24026	-2.340581	5.258214
##	ENSG00000271303	ENSG00000271303	SRXN1	6585	-2.340827	6.841251
##	ENSG00000154269	ENSG00000154269	ENPP3	118976	-2.341890	2.754647
##	ENSG00000270299	ENSG00000270299		29174	-2.342807	6.822120
##	ENSG00000185269	ENSG00000185269	NOTUM	9333	-2.344652	4.388509
##	ENSG00000158406	ENSG00000158406	H4C8	8029	-2.351010	2.589856
##	ENSG00000109956	ENSG00000109956	B3GAT1	33738	-2.351619	1.856873
##	ENSG00000158825	ENSG00000158825	CDA	29817	-2.352045	3.166026
##	ENSG00000129195	ENSG00000129195	PIMREG	7028	-2.352735	2.159461
##	ENSG00000174123	ENSG00000174123	TLR10	10752	-2.355294	2.075118
##	ENSG00000102109	ENSG00000102109	PCSK1N	4514	-2.365583	2.705364
##	ENSG00000203499	ENSG00000203499	IQANK1	56506	-2.366086	4.487141
##	ENSG00000185480	ENSG00000185480	PARPBP	77337	-2.366492	2.299793
##	ENSG00000115163	ENSG00000115163	CENPA	36778	-2.368280	2.333077
##	ENSG00000101447	ENSG00000101447	FAM83D	26794	-2.379832	3.250130
##	ENSG00000096696	ENSG00000096696	DSP	45097	-2.384595	7.958984
##	ENSG00000122966	ENSG00000122966	CIT	191529	-2.384878	6.657757
##	ENSG00000187715	ENSG00000187715	KBTBD12	72439	-2.389460	1.530014
##	ENSG00000129437	ENSG00000129437	KLK14	6750	-2.392367	1.329903
##	ENSG00000170439	ENSG00000170439	METTL7B	2875	-2.394566	3.084532
##	ENSG00000159228	ENSG00000159228	CBR1	3225	-2.395103	7.479897
##	ENSG00000056998	ENSG00000056998	GYG2	53998	-2.396366	3.024951
##	ENSG00000104738	ENSG00000104738	MCM4	17975	-2.400534	5.829956
##	ENSG00000100479	ENSG00000100479	POLE2	44867	-2.405264	1.766521
##	ENSG00000135119	ENSG00000135119	RNFT2	115453	-2.406277	2.028793
##	ENSG00000126778	ENSG00000126778	SIX1	14838	-2.407909	4.014739
##	ENSG00000154545	ENSG00000154545	MAGED4	7392	-2.411584	3.326674
##	ENSG00000177301	ENSG00000177301	KCNA2	111637	-2.414083	1.306155
##	ENSG00000163923	ENSG00000163923	RPL39L	59960	-2.414779	3.093984
##	ENSG00000101194	ENSG00000101194	SLC17A9	16878	-2.415420	3.815823
##	ENSG00000141696	ENSG00000141696	P3H4	10657	-2.418782	4.864609
##	ENSG00000140451	ENSG00000140451	PIF1	10036	-2.418998	1.244308
##	ENSG00000114346	ENSG00000114346	ECT2	70792	-2.419547	5.162820
##	ENSG00000157064	ENSG00000157064	NMNAT2	170143	-2.425377	3.324424
##	ENSG00000198807	ENSG00000198807	PAX9	21794	-2.427008	3.235313
##	ENSG00000163755	ENSG00000163755	HPS3	44094	-2.435190	6.960727
##	ENSG00000169783	ENSG00000169783	LINGO1	207873	-2.435586	1.647544
##	ENSG00000174564	ENSG00000174564	IL20RB	64855	-2.439428	2.807453
##	ENSG00000143847	ENSG00000143847	PPFIA4	52249	-2.440355	1.669869
##	ENSG00000167767	ENSG00000167767	KRT80	23018	-2.441915	5.226754
##	ENSG00000173432	ENSG00000173432	SAA1	3717	-2.445374	4.111690

## ENSG00000188610	ENSG00000188610	FAM72B	17893	-2.449935	1.409360
## ENSG00000082196	ENSG00000082196	C1QTNF3	25355	-2.452715	4.491860
## ENSG00000237988	ENSG00000237988	OR2I1P	7366	-2.452857	2.602127
## ENSG00000185467	ENSG00000185467	KPNA7	76503	-2.455275	1.303860
## ENSG00000174939	ENSG00000174939	ASPHD1	19489	-2.455482	2.518225
## ENSG00000111247	ENSG00000111247	RAD51AP1	21249	-2.457842	2.766213
## ENSG00000270885	ENSG00000270885	RASL10B	11882	-2.458674	1.905517
## ENSG00000213937	ENSG00000213937	CLDN9	1582	-2.461499	2.384258
## ENSG00000143297	ENSG00000143297	FCRL5	39138	-2.461648	2.793200
## ENSG00000162433	ENSG00000162433	AK4	84596	-2.465233	4.039419
## ENSG00000137563	ENSG00000137563	GGH	24526	-2.473243	5.044991
## ENSG00000007968	ENSG00000007968	E2F2	24795	-2.478222	1.969168
## ENSG00000100985	ENSG00000100985	MMP9	7653	-2.481973	5.644697
## ENSG00000151790	ENSG00000151790	TD02	65668	-2.491734	2.483362
## ENSG00000171346	ENSG00000171346	KRT15	8784	-2.497503	4.983836
## ENSG00000009694	ENSG00000009694	TENM1	828409	-2.500898	2.843353
## ENSG00000103888	ENSG00000103888	CEMIP	172433	-2.509558	5.758114
## ENSG00000198826	ENSG00000198826	ARHGAP11A	24797	-2.513407	3.786066
## ENSG00000229314	ENSG00000229314	ORM1	3381	-2.513771	4.069959
## ENSG00000143217	ENSG00000143217	NECTIN4	18560	-2.514448	5.377000
## ENSG00000178445	ENSG00000178445	GLDC	113262	-2.523091	1.144529
## ENSG00000197299	ENSG00000197299	BLM	98820	-2.523442	2.631804
## ENSG00000248771	ENSG00000248771	SMIM31	49731	-2.526926	1.388549
## ENSG00000188322	ENSG00000188322	SBK1	64603	-2.527463	4.099177
## ENSG00000146013	ENSG00000146013	GFRA3	22241	-2.528481	3.177251
## ENSG00000198598	ENSG00000198598	MMP17	23390	-2.530352	2.078448
## ENSG00000149554	ENSG00000149554	CHEK1	51092	-2.530860	3.502608
## ENSG00000196917	ENSG00000196917	HCAR1	4768	-2.535522	2.533293
## ENSG00000051180	ENSG00000051180	RAD51	37566	-2.540316	2.170464
## ENSG00000106541	ENSG00000106541	AGR2	41622	-2.543597	8.441692
## ENSG00000214756	ENSG00000214756	CSKMT	3187	-2.548237	3.181617
## ENSG00000100558	ENSG00000100558	PLEK2	25183	-2.549265	3.213021
## ENSG00000152049	ENSG00000152049	KCNE4	146209	-2.562002	4.050495
## ENSG00000178623	ENSG00000178623	GPR35	27729	-2.563130	2.614262
## ENSG00000197837	ENSG00000197837	H4C16	3132	-2.566890	1.062930
## ENSG00000138346	ENSG00000138346	DNA2	58057	-2.568179	2.606132
## ENSG00000121895	ENSG00000121895	TMEM156	66178	-2.568709	1.842305
## ENSG00000156234	ENSG00000156234	CXCL13	100081	-2.571492	4.110424
## ENSG00000171241	ENSG00000171241	SHCBP1	42788	-2.575875	2.862497
## ENSG00000184408	ENSG00000184408	KCND2	477162	-2.579143	1.226799
## ENSG00000196139	ENSG00000196139	AKR1C3	72332	-2.579944	7.401068
## ENSG00000240204	ENSG00000240204	SMKR1	10387	-2.582288	1.041919
## ENSG00000145386	ENSG00000145386	CCNA2	7439	-2.584065	3.906662
## ENSG00000130383	ENSG00000130383	FUT5	4714	-2.585032	1.050076
## ENSG00000155066	ENSG00000155066	PROM2	16859	-2.589815	5.576674
## ENSG00000124102	ENSG00000124102	PI3	1642	-2.594253	2.597653
## ENSG00000180287	ENSG00000180287	PLD5	441711	-2.597881	1.562117
## ENSG00000165731	ENSG00000165731	RET	53287	-2.598179	2.542354
## ENSG00000153253	ENSG00000153253	SCN3A	116524	-2.598305	1.944568
## ENSG00000104147	ENSG00000104147	OIP5	23318	-2.598505	1.307905
## ENSG00000141934	ENSG00000141934	PLPP2	10363	-2.603198	5.784077
## ENSG00000136943	ENSG00000136943	CTSV	126879	-2.608902	2.725437
## ENSG00000147697	ENSG00000147697	GSDMC	38428	-2.611557	1.828847
## ENSG00000070182	ENSG00000070182	SPTB	133624	-2.615289	4.432978

## ENSG00000146197	ENSG00000146197	SCUBE3	39123	-2.617249	3.509229
## ENSG00000181143	ENSG00000181143	MUC16	132498	-2.618328	4.975071
## ENSG00000091137	ENSG00000091137	SLC26A4	56981	-2.619321	2.804062
## ENSG00000135454	ENSG00000135454	B4GALNT1	9830	-2.620725	2.470220
## ENSG00000148346	ENSG00000148346	LCN2	4382	-2.623308	6.756668
## ENSG00000119969	ENSG00000119969	HELLS	68576	-2.629510	3.353169
## ENSG00000108309	ENSG00000108309	RUNDC3A	10257	-2.636501	1.053986
## ENSG00000068489	ENSG00000068489	PRR11	50977	-2.636509	3.479207
## ENSG00000073150	ENSG00000073150	PANX2	9564	-2.637470	3.345273
## ENSG00000138316	ENSG00000138316	ADAMTS14	89935	-2.638271	2.012343
## ENSG00000132437	ENSG00000132437	DDC	106969	-2.640038	3.416543
## ENSG00000152253	ENSG00000152253	SPC25	79239	-2.640761	1.551997
## ENSG00000181218	ENSG00000181218	H2AC25	23096	-2.648303	2.527752
## ENSG00000138798	ENSG00000138798	EGF	100883	-2.649429	2.849549
## ENSG00000185760	ENSG00000185760	KCNQ5	577061	-2.650816	1.519334
## ENSG00000029153	ENSG00000029153	BMAL2	92453	-2.651065	4.465588
## ENSG00000164045	ENSG00000164045	CDC25A	31271	-2.652836	1.834988
## ENSG00000103089	ENSG00000103089	FA2H	61876	-2.656643	4.063304
## ENSG00000188766	ENSG00000188766	SPRED3	11166	-2.657974	1.215847
## ENSG00000103460	ENSG00000103460	TOX3	111385	-2.658109	3.775841
## ENSG00000137573	ENSG00000137573	SULF1	194291	-2.659841	6.813545
## ENSG00000155754	ENSG00000155754	C2CD6	131757	-2.664158	1.056071
## ENSG00000152766	ENSG00000152766	ANKRD22	31948	-2.665019	3.119993
## ENSG00000132840	ENSG00000132840	BHMT2	20302	-2.668534	3.000814
## ENSG00000170312	ENSG00000170312	CDK1	16521	-2.669316	4.442705
## ENSG00000115828	ENSG00000115828	QPCT	30495	-2.671337	4.684017
## ENSG00000078098	ENSG00000078098	FAP	74467	-2.674103	4.469082
## ENSG00000085999	ENSG00000085999	RAD54L	32019	-2.679860	2.430902
## ENSG00000135052	ENSG00000135052	GOLM1	74027	-2.687470	7.416938
## ENSG00000196876	ENSG00000196876	SCN8A	222598	-2.687684	1.411407
## ENSG00000173894	ENSG00000173894	CBX2	9835	-2.689709	3.589001
## ENSG00000108846	ENSG00000108846	ABCC3	57476	-2.690823	7.199042
## ENSG00000144485	ENSG00000144485	HES6	2395	-2.692524	3.563126
## ENSG00000162931	ENSG00000162931	TRIM17	8926	-2.693077	2.011479
## ENSG00000158315	ENSG00000158315	RHBDL2	56023	-2.701656	2.576152
## ENSG00000106462	ENSG00000106462	EZH2	77064	-2.703141	3.499588
## ENSG00000172031	ENSG00000172031	EPHX4	33553	-2.724190	1.227518
## ENSG00000145113	ENSG00000145113	MUC4	65208	-2.726209	6.991422
## ENSG00000137309	ENSG00000137309	HMGA1	9358	-2.733977	7.525290
## ENSG00000165905	ENSG00000165905	LARGE2	7475	-2.737077	4.517815
## ENSG00000205213	ENSG00000205213	LGR4	106829	-2.746452	5.368548
## ENSG00000133477	ENSG00000133477	FAM83F	48580	-2.748253	2.908293
## ENSG00000215784	ENSG00000215784	FAM72D	16722	-2.752576	1.081586
## ENSG00000087586	ENSG00000087586	AURKA	22948	-2.756258	3.741156
## ENSG00000087494	ENSG00000087494	PTHLH	14649	-2.757260	2.117361
## ENSG00000136531	ENSG00000136531	SCN2A	197317	-2.757386	1.802820
## ENSG00000133216	ENSG00000133216	EPHB2	210661	-2.758719	4.914977
## ENSG00000122952	ENSG00000122952	ZWINT	4046	-2.768601	4.210821
## ENSG00000169258	ENSG00000169258	GPRIN1	14354	-2.768675	2.606398
## ENSG00000134028	ENSG00000134028	ADAMDEC1	21728	-2.772166	2.742040
## ENSG00000140534	ENSG00000140534	TICRR	55587	-2.779735	2.091441
## ENSG00000123473	ENSG00000123473	STIL	64753	-2.786350	3.042682
## ENSG00000173898	ENSG00000173898	SPTBN2	62173	-2.787013	5.148166
## ENSG00000071539	ENSG00000071539	TRIP13	26473	-2.787128	3.796434

## ENSG00000198901	ENSG00000198901	PRC1	29589	-2.789162	4.491081
## ENSG00000162383	ENSG00000162383	SLC1A7	55459	-2.789478	3.945279
## ENSG00000131187	ENSG00000131187	F12	14450	-2.794737	1.519596
## ENSG00000162078	ENSG00000162078	ZG16B	9332	-2.794747	2.160698
## ENSG00000105889	ENSG00000105889	STEAP1B	308169	-2.795677	1.266004
## ENSG00000167900	ENSG00000167900	TK1	13142	-2.799222	5.103472
## ENSG00000084110	ENSG00000084110	HAL	23703	-2.799889	2.710911
## ENSG00000165973	ENSG00000165973	NELL1	906135	-2.801569	2.121066
## ENSG00000137804	ENSG00000137804	NUSAP1	60256	-2.801721	4.208652
## ENSG00000147536	ENSG00000147536	GINS4	15812	-2.802221	2.706682
## ENSG00000137807	ENSG00000137807	KIF23	34181	-2.812538	3.608809
## ENSG00000061656	ENSG00000061656	SPAG4	5265	-2.815562	2.966793
## ENSG00000263513	ENSG00000263513	FAM72C	16699	-2.818914	1.318661
## ENSG00000100604	ENSG00000100604	CHGA	12135	-2.822774	2.824605
## ENSG00000178752	ENSG00000178752	ERFE	9930	-2.826056	1.230002
## ENSG00000166415	ENSG00000166415	WDR72	249137	-2.835886	3.248786
## ENSG00000164220	ENSG00000164220	F2RL2	7931	-2.840488	2.354802
## ENSG00000101842	ENSG00000101842	VSIG1	34214	-2.842035	4.525952
## ENSG00000188385	ENSG00000188385	JAKMIP3	148522	-2.842545	1.051945
## ENSG00000106089	ENSG00000106089	STX1A	20466	-2.842605	3.106260
## ENSG00000137809	ENSG00000137809	ITGA11	135631	-2.847520	4.668455
## ENSG00000160180	ENSG00000160180	TFF3	3742	-2.849279	6.074881
## ENSG00000101049	ENSG00000101049	SGK2	29269	-2.850322	1.428789
## ENSG00000137673	ENSG00000137673	MMP7	10242	-2.851603	6.558674
## ENSG00000233822	ENSG00000233822	H2BC15	17164	-2.856114	1.714410
## ENSG00000092758	ENSG00000092758	COL9A3	24915	-2.863974	1.556318
## ENSG00000105664	ENSG00000105664	COMP	8532	-2.872076	4.700537
## ENSG00000164647	ENSG00000164647	STEAP1	10373	-2.873886	3.859877
## ENSG00000108602	ENSG00000108602	ALDH3A1	10959	-2.877503	6.587729
## ENSG00000060709	ENSG00000060709	RIMBP2	372095	-2.880667	1.245782
## ENSG00000124882	ENSG00000124882	EREG	23604	-2.881268	4.434868
## ENSG00000125319	ENSG00000125319	HROB	20570	-2.896062	1.966997
## ENSG00000107984	ENSG00000107984	DKK1	3761	-2.903321	3.909925
## ENSG00000122861	ENSG00000122861	PLAU	8319	-2.904163	6.883787
## ENSG00000170577	ENSG00000170577	SIX2	4270	-2.905204	1.490526
## ENSG00000066230	ENSG00000066230	SLC9A3	53993	-2.905856	2.005935
## ENSG00000001084	ENSG00000001084	GCLC	119629	-2.907320	6.550364
## ENSG00000105825	ENSG00000105825	TFPI2	5357	-2.916065	5.894020
## ENSG00000176945	ENSG00000176945	MUC20	20239	-2.916777	6.175090
## ENSG00000186847	ENSG00000186847	KRT14	4616	-2.921198	1.462772
## ENSG00000166922	ENSG00000166922	SCG5	55422	-2.925993	2.681089
## ENSG00000092853	ENSG00000092853	CLSPN	49760	-2.928259	2.181648
## ENSG00000100473	ENSG00000100473	COCH	20551	-2.937033	3.195872
## ENSG00000156096	ENSG00000156096	UGT2B4	45849	-2.938893	2.114021
## ENSG00000134258	ENSG00000134258	VTGN1	67373	-2.945102	2.745631
## ENSG00000152377	ENSG00000152377	SPOCK1	623081	-2.945131	3.017769
## ENSG00000171320	ENSG00000171320	ESCO2	40691	-2.949608	1.733021
## ENSG00000198734	ENSG00000198734	F5	74637	-2.954939	4.130822
## ENSG00000116711	ENSG00000116711	PLA2G4A	160032	-2.956132	5.479784
## ENSG00000105048	ENSG00000105048	TNNT1	16508	-2.956627	3.302847
## ENSG00000188910	ENSG00000188910	GJB3	5155	-2.958758	2.552263
## ENSG00000007350	ENSG00000007350	TKTL1	34555	-2.962163	2.346046
## ENSG00000138778	ENSG00000138778	CENPE	93096	-2.964369	3.058386
## ENSG00000134057	ENSG00000134057	CCNB1	11110	-2.965358	4.390669

##	ENSG00000186806	ENSG00000186806	VSIG10L	10603	-2.966373	3.466185
##	ENSG00000101076	ENSG00000101076	HNF4A	77146	-2.966902	2.071549
##	ENSG00000165449	ENSG00000165449	SLC16A9	85238	-2.974993	3.715037
##	ENSG00000165891	ENSG00000165891	E2F7	44321	-2.975370	1.512383
##	ENSG00000186340	ENSG00000186340	THBS2	38270	-2.975840	7.029120
##	ENSG00000189057	ENSG00000189057	FAM111B	20227	-2.976320	2.869172
##	ENSG00000163975	ENSG00000163975	MELTF	49245	-2.979639	4.016408
##	ENSG00000062038	ENSG00000062038	CDH3	91279	-2.981698	6.279815
##	ENSG00000132749	ENSG00000132749	TESMIN	44080	-2.987011	1.691679
##	ENSG00000108821	ENSG00000108821	COL1A1	17531	-2.987617	10.771225
##	ENSG00000138160	ENSG00000138160	KIF11	81290	-2.997332	4.042374
##	ENSG00000281406	ENSG00000281406	BLACAT1	22206	-3.000464	1.609540
##	ENSG00000137812	ENSG00000137812	KNL1	70322	-3.004192	2.812704
##	ENSG00000163808	ENSG00000163808	KIF15	111655	-3.012582	2.337421
##	ENSG00000100095	ENSG00000100095	SEZ6L	214135	-3.014141	1.081307
##	ENSG00000166546	ENSG00000166546	BEAN1	66234	-3.021286	2.542276
##	ENSG00000174501	ENSG00000174501	ANKRD36C	154912	-3.023301	3.167452
##	ENSG00000158373	ENSG00000158373	H2BC5	13227	-3.027120	3.841108
##	ENSG00000170442	ENSG00000170442	KRT86	59863	-3.041657	1.983617
##	ENSG00000182489	ENSG00000182489	XKRX	15988	-3.044510	3.270257
##	ENSG00000103257	ENSG00000103257	SLC7A5	39484	-3.046207	6.592679
##	ENSG00000171631	ENSG00000171631	P2RY6	40605	-3.052547	3.223374
##	ENSG00000136492	ENSG00000136492	BRIP1	184420	-3.060200	2.375871
##	ENSG00000110492	ENSG00000110492	MDK	3081	-3.068378	7.404289
##	ENSG00000141527	ENSG00000141527	CARD14	46081	-3.070611	2.714497
##	ENSG00000163568	ENSG00000163568	AIM2	126244	-3.076602	2.498417
##	ENSG00000144354	ENSG00000144354	CDCA7	14177	-3.079863	3.780535
##	ENSG00000129521	ENSG00000129521	EGLN3	538547	-3.081624	5.247280
##	ENSG00000179546	ENSG00000179546	HTR1D	25607	-3.104737	1.269234
##	ENSG00000103269	ENSG00000103269	RHBDL1	2597	-3.112177	1.401380
##	ENSG00000237289	ENSG00000237289	CKMT1B	11847	-3.114673	3.732250
##	ENSG00000085840	ENSG00000085840	ORC1	31594	-3.115307	2.254342
##	ENSG00000188488	ENSG00000188488	SERPINA5	31676	-3.116038	1.770308
##	ENSG00000128422	ENSG00000128422	KRT17	5400	-3.124316	6.545056
##	ENSG00000110427	ENSG00000110427	KIAA1549L	297994	-3.125928	1.765441
##	ENSG00000127561	ENSG00000127561	SYNGR3	4615	-3.126760	1.400246
##	ENSG00000178401	ENSG00000178401	DNAJC22	10658	-3.131830	2.157652
##	ENSG00000274290	ENSG00000274290	H2BC6	12596	-3.144306	1.442745
##	ENSG00000187583	ENSG00000187583	PLEKHN1	9383	-3.145462	2.018900
##	ENSG00000148344	ENSG00000148344	PTGES	14711	-3.146145	4.747305
##	ENSG00000166473	ENSG00000166473	PKD1L2	119495	-3.151584	1.390009
##	ENSG00000176920	ENSG00000176920	FUT2	9980	-3.159168	3.615223
##	ENSG00000100526	ENSG00000100526	CDKN3	23369	-3.159573	2.377940
##	ENSG00000115616	ENSG00000115616	SLC9A2	91802	-3.165911	1.550228
##	ENSG00000143590	ENSG00000143590	EFNA3	8701	-3.167063	2.517002
##	ENSG00000223572	ENSG00000223572	CKMT1A	6336	-3.171012	2.381054
##	ENSG00000196208	ENSG00000196208	GREB1	160447	-3.174707	2.933631
##	ENSG00000101311	ENSG00000101311	FERMT1	48369	-3.182675	4.006266
##	ENSG00000112984	ENSG00000112984	KIF20A	9004	-3.188856	3.423230
##	ENSG00000178773	ENSG00000178773	CPNE7	21488	-3.190221	1.965079
##	ENSG00000166803	ENSG00000166803	PCLAF	23383	-3.191607	3.444008
##	ENSG00000091651	ENSG00000091651	ORC6	8751	-3.197684	2.142492
##	ENSG00000066248	ENSG00000066248	NGEF	134555	-3.200111	2.631481
##	ENSG00000175497	ENSG00000175497	DPP10	1403481	-3.201243	1.912202



##	ENSG00000251493	ENSG00000251493	FOXD1	3950	-3.205116	1.001415
##	ENSG00000101680	ENSG00000101680	LAMA1	176055	-3.212496	3.638317
##	ENSG00000163053	ENSG00000163053	SLC16A14	34011	-3.214123	4.679487
##	ENSG00000142583	ENSG00000142583	SLC2A5	53372	-3.220700	2.572303
##	ENSG00000166920	ENSG00000166920	C15orf48	18182	-3.221772	4.990275
##	ENSG00000198753	ENSG00000198753	PLXNB3	15150	-3.221865	3.913441
##	ENSG00000134690	ENSG00000134690	CDCA8	17238	-3.226724	3.402587
##	ENSG00000153002	ENSG00000153002	CPB1	69085	-3.229885	2.709901
##	ENSG00000121207	ENSG00000121207	LRAT	126175	-3.233301	2.779461
##	ENSG00000143858	ENSG00000143858	SYT2	119858	-3.238352	2.080774
##	ENSG00000085552	ENSG00000085552	IGSF9	18574	-3.245308	3.929890
##	ENSG00000124602	ENSG00000124602	UNC5CL	12326	-3.246770	3.400103
##	ENSG00000162849	ENSG00000162849	KIF26B	554447	-3.248139	4.841357
##	ENSG00000181019	ENSG00000181019	NQO1	19672	-3.260900	7.601643
##	ENSG00000105464	ENSG00000105464	GRIN2D	51263	-3.261757	2.684921
##	ENSG00000184661	ENSG00000184661	CDCA2	48712	-3.263022	1.877335
##	ENSG00000148848	ENSG00000148848	ADAM12	376096	-3.268563	4.060216
##	ENSG00000164749	ENSG00000164749	HNF4G	158920	-3.281851	1.984855
##	ENSG00000080986	ENSG00000080986	NDC80	45078	-3.282348	2.687393
##	ENSG00000164638	ENSG00000164638	SLC29A4	32543	-3.282721	4.309697
##	ENSG00000141449	ENSG00000141449	GREB1L	283880	-3.289179	1.357585
##	ENSG00000170627	ENSG00000170627	GTSF1	17652	-3.295478	1.915692
##	ENSG00000111665	ENSG00000111665	CDCA3	6499	-3.312559	2.780626
##	ENSG00000146670	ENSG00000146670	CDCA5	17864	-3.317979	3.830223
##	ENSG00000008300	ENSG00000008300	CELSR3	26423	-3.336361	3.158964
##	ENSG00000160161	ENSG00000160161	CILP2	8411	-3.341115	2.653059
##	ENSG00000104783	ENSG00000104783	KCNN4	14443	-3.346588	4.859146
##	ENSG00000171004	ENSG00000171004	HS6ST2	335380	-3.358452	4.273579
##	ENSG00000158402	ENSG00000158402	CDC25C	53086	-3.358470	1.266062
##	ENSG00000154839	ENSG00000154839	SKA1	19128	-3.360802	1.831445
##	ENSG00000157456	ENSG00000157456	CCNB2	19919	-3.365416	3.506314
##	ENSG00000049283	ENSG00000049283	EPN3	11068	-3.366647	3.634068
##	ENSG00000129173	ENSG00000129173	E2F8	17557	-3.370061	2.089188
##	ENSG00000196754	ENSG00000196754	S100A2	6782	-3.370847	4.681766
##	ENSG00000117983	ENSG00000117983	MUC5B	39106	-3.381634	8.389791
##	ENSG00000029993	ENSG00000029993	HMGB3	10262	-3.385482	7.090404
##	ENSG00000114631	ENSG00000114631	PODXL2	43617	-3.418570	4.884155
##	ENSG00000165480	ENSG00000165480	SKA3	22957	-3.423176	2.024676
##	ENSG00000121152	ENSG00000121152	NCAPH	41325	-3.428421	3.148993
##	ENSG00000169607	ENSG00000169607	CKAP2L	28315	-3.450873	2.710253
##	ENSG00000188761	ENSG00000188761	BCL2L15	10765	-3.455074	2.846197
##	ENSG00000114270	ENSG00000114270	COL7A1	31256	-3.457049	4.183240
##	ENSG00000160886	ENSG00000160886	LY6K	5016	-3.465042	3.354075
##	ENSG00000132746	ENSG00000132746	ALDH3B2	19069	-3.467257	3.432134
##	ENSG00000129810	ENSG00000129810	SGO1	25613	-3.472081	1.556176
##	ENSG00000094755	ENSG00000094755	GABRP	50697	-3.493206	3.357162
##	ENSG00000077152	ENSG00000077152	UBE2T	10440	-3.495987	3.369395
##	ENSG00000166851	ENSG00000166851	PLK1	12711	-3.496154	3.864321
##	ENSG00000125851	ENSG00000125851	PCSK2	258471	-3.502148	5.928994
##	ENSG00000148773	ENSG00000148773	MKI67	29764	-3.505263	5.653795
##	ENSG00000137571	ENSG00000137571	SLC05A1	167932	-3.514424	1.328228
##	ENSG00000171848	ENSG00000171848	RRM2	91027	-3.518268	4.901233
##	ENSG00000186871	ENSG00000186871	ERCC6L	34370	-3.523213	1.545372
##	ENSG00000183317	ENSG00000183317	EPHA10	51253	-3.524587	2.509319

##	ENSG00000142273	ENSG00000142273	CBLC	22783	-3.529063	3.627061
##	ENSG00000278828	ENSG00000278828	H3C10	1249	-3.537604	2.129808
##	ENSG00000196584	ENSG00000196584	XRCC2	31417	-3.548435	2.050162
##	ENSG00000124664	ENSG00000124664	SPDEF	18531	-3.549445	4.712907
##	ENSG00000075218	ENSG00000075218	GTSE1	33940	-3.553026	2.803629
##	ENSG00000171246	ENSG00000171246	NPTX1	11009	-3.564805	3.924291
##	ENSG00000006611	ENSG00000006611	USH1C	50521	-3.576286	1.266821
##	ENSG00000047457	ENSG00000047457	CP	59419	-3.618250	8.331939
##	ENSG00000170835	ENSG00000170835	CEL	9880	-3.631638	2.372457
##	ENSG00000133055	ENSG00000133055	MYBPH	8015	-3.639745	1.018645
##	ENSG00000011347	ENSG00000011347	SYT7	67434	-3.646697	5.374089
##	ENSG00000058404	ENSG00000058404	CAMK2B	124558	-3.650326	1.287150
##	ENSG00000178999	ENSG00000178999	AURKB	5867	-3.662540	2.835619
##	ENSG00000151012	ENSG00000151012	SLC7A11	78252	-3.668832	4.938182
##	ENSG00000117724	ENSG00000117724	CENPF	61389	-3.670048	4.950162
##	ENSG00000198125	ENSG00000198125	MB	31187	-3.680748	2.683078
##	ENSG00000276043	ENSG00000276043	UHRF1	59074	-3.687331	3.400163
##	ENSG00000112742	ENSG00000112742	TTK	38640	-3.696195	2.745443
##	ENSG00000051341	ENSG00000051341	POLQ	114557	-3.697170	2.105291
##	ENSG00000128298	ENSG00000128298	BAIAP2L2	26363	-3.706716	1.669261
##	ENSG00000128165	ENSG00000128165	ADM2	4897	-3.713346	3.282959
##	ENSG00000164932	ENSG00000164932	CTHRC1	11451	-3.719248	5.231348
##	ENSG00000111344	ENSG00000111344	RASAL1	37420	-3.723641	2.204114
##	ENSG00000104112	ENSG00000104112	SCG3	39534	-3.727039	2.237546
##	ENSG00000088992	ENSG00000088992	TESC	60556	-3.742920	5.536622
##	ENSG00000198732	ENSG00000198732	SMOC1	178235	-3.744759	3.586725
##	ENSG00000171903	ENSG00000171903	CYP4F11	22500	-3.774619	3.562753
##	ENSG00000183010	ENSG00000183010	PYCR1	10028	-3.776303	6.227092
##	ENSG00000162062	ENSG00000162062	TEDC2	4877	-3.779429	1.846406
##	ENSG00000135069	ENSG00000135069	PSAT1	32968	-3.789409	3.959873
##	ENSG00000177398	ENSG00000177398	UMODL1	80494	-3.809772	1.879650
##	ENSG00000174469	ENSG00000174469	CNTNAP2	2304996	-3.814188	2.882520
##	ENSG00000169347	ENSG00000169347	GP2	18234	-3.818236	2.472036
##	ENSG00000204544	ENSG00000204544	MUC21	6185	-3.822376	5.774204
##	ENSG00000165304	ENSG00000165304	MELK	104821	-3.839741	3.104730
##	ENSG00000162782	ENSG00000162782	TDRD5	99659	-3.842627	1.248715
##	ENSG00000065618	ENSG00000065618	COL17A1	54594	-3.845347	4.783292
##	ENSG00000133316	ENSG00000133316	WDR74	9467	-3.848022	7.259763
##	ENSG00000171747	ENSG00000171747	LGALS4	11274	-3.857185	4.802593
##	ENSG00000136231	ENSG00000136231	IGF2BP3	160282	-3.864118	3.686097
##	ENSG00000143228	ENSG00000143228	NUF2	89188	-3.868167	2.759545
##	ENSG00000169507	ENSG00000169507	SLC38A11	61171	-3.877698	1.233076
##	ENSG00000138271	ENSG00000138271	GPR87	22734	-3.885164	2.341111
##	ENSG00000142945	ENSG00000142945	KIF2C	27949	-3.889540	3.726968
##	ENSG00000092607	ENSG00000092607	TBX15	106510	-3.890280	2.727900
##	ENSG00000124466	ENSG00000124466	LYPD3	4821	-3.892625	3.707772
##	ENSG00000117399	ENSG00000117399	CDC20	4222	-3.896294	3.890805
##	ENSG00000161958	ENSG00000161958	FGF11	6664	-3.904075	2.778444
##	ENSG00000126787	ENSG00000126787	DLGAP5	43496	-3.905129	3.152199
##	ENSG00000089685	ENSG00000089685	BIRC5	11450	-3.910307	4.474248
##	ENSG00000175832	ENSG00000175832	ETV4	51776	-3.914979	4.773879
##	ENSG00000156970	ENSG00000156970	BUB1B	60100	-3.920784	3.403126
##	ENSG00000124143	ENSG00000124143	ARHGAP40	49226	-3.929162	2.513811
##	ENSG00000115507	ENSG00000115507	OTX1	7779	-3.931893	2.209492

## ENSG00000134873	ENSG00000134873	CLDN10	146155	-3.934714	3.762895
## ENSG00000117650	ENSG00000117650	NEK2	16973	-3.958573	3.048287
## ENSG00000066279	ENSG00000066279	ASPM	62573	-3.958749	3.700597
## ENSG00000135451	ENSG00000135451	TROAP	8495	-3.963477	2.907420
## ENSG00000105696	ENSG00000105696	TMEM59L	13609	-3.968826	3.515798
## ENSG00000011426	ENSG00000011426	ANLN	63970	-3.969100	4.803651
## ENSG00000104140	ENSG00000104140	RHOV	2020	-3.977688	4.346220
## ENSG00000186193	ENSG00000186193	SAPCD2	8430	-3.980648	3.493044
## ENSG00000147889	ENSG00000147889	CDKN2A	27549	-3.993789	4.188427
## ENSG00000088325	ENSG00000088325	TPX2	62534	-3.998422	5.116722
## ENSG00000094804	ENSG00000094804	CDC6	16778	-4.002867	3.986941
## ENSG00000213420	ENSG00000213420	GPC2	7775	-4.003381	1.156500
## ENSG00000101115	ENSG00000101115	SALL4	20190	-4.006573	1.675759
## ENSG00000170465	ENSG00000170465	KRT6C	5289	-4.009222	1.415237
## ENSG00000156413	ENSG00000156413	FUT6	9314	-4.010948	2.473920
## ENSG00000124116	ENSG00000124116	WFDC3	43988	-4.011444	2.351048
## ENSG00000188833	ENSG00000188833	ENTPD8	7452	-4.024521	1.142846
## ENSG00000105173	ENSG00000105173	CCNE1	12321	-4.039247	2.940768
## ENSG00000106536	ENSG00000106536	POU6F2	515186	-4.050467	1.477954
## ENSG00000134323	ENSG00000134323	MYCN	6457	-4.075284	1.760686
## ENSG00000024526	ENSG00000024526	DEPDC1	23069	-4.080800	2.612252
## ENSG00000174371	ENSG00000174371	EXO1	47181	-4.085700	2.707753
## ENSG00000123572	ENSG00000123572	NRK	136071	-4.088537	2.663175
## ENSG00000117394	ENSG00000117394	SLC2A1	33540	-4.094621	7.020444
## ENSG00000123485	ENSG00000123485	HJURP	21150	-4.104340	3.104125
## ENSG00000118271	ENSG00000118271	TTR	41824	-4.116432	1.088113
## ENSG00000043039	ENSG00000043039	BARX2	76431	-4.129312	2.697860
## ENSG00000158089	ENSG00000158089	GALNT14	244735	-4.133669	3.793485
## ENSG00000090889	ENSG00000090889	KIF4A	130782	-4.153193	3.449308
## ENSG00000186185	ENSG00000186185	KIF18B	23064	-4.156326	2.965324
## ENSG00000105641	ENSG00000105641	SLC5A5	23229	-4.159677	1.935027
## ENSG00000144191	ENSG00000144191	CNGA3	52413	-4.181317	1.178952
## ENSG00000175063	ENSG00000175063	UBE2C	4381	-4.188193	4.079082
## ENSG00000119125	ENSG00000119125	GDA	142598	-4.188250	1.528730
## ENSG00000197444	ENSG00000197444	OGDHL	27738	-4.196598	1.495382
## ENSG00000131746	ENSG00000131746	TNS4	25795	-4.204534	4.447978
## ENSG00000254726	ENSG00000254726	MEX3A	10452	-4.236849	3.992797
## ENSG00000198535	ENSG00000198535	C2CD4A	3940	-4.253093	3.303404
## ENSG00000196542	ENSG00000196542	SPTSSB	28082	-4.257952	1.348549
## ENSG00000158125	ENSG00000158125	XDH	80421	-4.259832	3.754741
## ENSG00000131747	ENSG00000131747	TOP2A	29371	-4.261814	6.239918
## ENSG00000184956	ENSG00000184956	MUC6	23895	-4.269657	3.457243
## ENSG00000135744	ENSG00000135744	AGT	54800	-4.274810	5.328161
## ENSG00000182379	ENSG00000182379	NXPH4	9655	-4.279043	1.603377
## ENSG00000188175	ENSG00000188175	HEPACAM2	37935	-4.312074	1.681516
## ENSG00000088386	ENSG00000088386	SLC15A1	68871	-4.316417	1.314035
## ENSG00000133636	ENSG00000133636	NTS	8697	-4.328651	4.828698
## ENSG00000188338	ENSG00000188338	SLC38A3	16240	-4.341610	1.323652
## ENSG00000179913	ENSG00000179913	B3GNT3	18748	-4.368453	4.516420
## ENSG00000198691	ENSG00000198691	ABCA4	128314	-4.398914	4.185611
## ENSG00000129988	ENSG00000129988	LBP	30531	-4.402767	1.432969
## ENSG00000100867	ENSG00000100867	DHRS2	15524	-4.410155	3.258626
## ENSG00000105219	ENSG00000105219	CCNP	4489	-4.426859	1.164487
## ENSG00000145824	ENSG00000145824	CXCL14	8600	-4.475492	6.404535

##	ENSG00000169894	ENSG00000169894	MUC3A	18813	-4.485865	5.324528
##	ENSG00000169436	ENSG00000169436	COL22A1	325806	-4.496664	2.285906
##	ENSG00000143452	ENSG00000143452	HORMAD1	22835	-4.500591	1.388279
##	ENSG00000262406	ENSG00000262406	MMP12	12246	-4.504756	4.185184
##	ENSG00000165188	ENSG00000165188	RNF183	6283	-4.505654	1.110471
##	ENSG00000123500	ENSG00000123500	COL10A1	39838	-4.526463	4.949523
##	ENSG00000206075	ENSG00000206075	SERPINB5	28127	-4.540449	3.290967
##	ENSG00000277586	ENSG00000277586	NEFL	5766	-4.545233	1.794467
##	ENSG00000109674	ENSG00000109674	NEIL3	53062	-4.550466	1.363858
##	ENSG00000184260	ENSG00000184260	H2AC20	493	-4.644899	1.732665
##	ENSG00000139352	ENSG00000139352	ASCL1	2839	-4.651065	3.714134
##	ENSG00000169903	ENSG00000169903	TM4SF4	28697	-4.671516	3.364070
##	ENSG00000204616	ENSG00000204616	TRIM31	10193	-4.686049	2.853766
##	ENSG00000008196	ENSG00000008196	TFAP2B	28896	-4.701038	1.340515
##	ENSG00000171560	ENSG00000171560	FGA	7616	-4.712220	8.431608
##	ENSG00000171551	ENSG00000171551	ECEL1	8007	-4.719321	1.185665
##	ENSG00000115718	ENSG00000115718	PROC	10815	-4.723866	1.878730
##	ENSG00000253293	ENSG00000253293	HOXA10	9656	-4.738341	1.875005
##	ENSG00000079112	ENSG00000079112	CDH17	90141	-4.742361	2.056971
##	ENSG00000137860	ENSG00000137860	SLC28A2	25612	-4.743674	1.661633
##	ENSG00000054356	ENSG00000054356	PTPRN	20025	-4.757345	1.734265
##	ENSG00000168243	ENSG00000168243	GNG4	103069	-4.761466	2.721204
##	ENSG00000154040	ENSG00000154040	CABYR	22613	-4.765725	3.181603
##	ENSG00000019505	ENSG00000019505	SYT13	46039	-4.768131	3.578811
##	ENSG00000105388	ENSG00000105388	CEACAM5	21848	-4.797222	8.799215
##	ENSG00000006047	ENSG00000006047	YBX2	6376	-4.800324	1.613015
##	ENSG00000002726	ENSG00000002726	AOC1	36877	-4.802191	4.162058
##	ENSG00000146166	ENSG00000146166	LGSN	44032	-4.810449	3.717458
##	ENSG00000196787	ENSG00000196787	H2AC11	492	-4.817337	1.946716
##	ENSG00000162482	ENSG00000162482	AKR7A3	6197	-4.852468	2.649896
##	ENSG00000198488	ENSG00000198488	B3GNT6	7575	-4.854511	2.388237
##	ENSG00000273542	ENSG00000273542	H4C12	386	-4.866953	3.232052
##	ENSG00000151632	ENSG00000151632	AKR1C2	30256	-4.906164	8.410236
##	ENSG00000182272	ENSG00000182272	B4GALNT4	12618	-4.917042	2.667229
##	ENSG00000203811	ENSG00000203811	H3C14	521	-4.921725	1.861835
##	ENSG00000163207	ENSG00000163207	IVL	3340	-4.925683	2.772751
##	ENSG00000273802	ENSG00000273802	H2BC8	488	-4.926236	2.274369
##	ENSG00000137868	ENSG00000137868	STRA6	32801	-4.944816	3.354032
##	ENSG00000099953	ENSG00000099953	MMP11	16090	-4.962511	5.910371
##	ENSG00000186474	ENSG00000186474	KLK12	6138	-4.991686	3.042908
##	ENSG00000143320	ENSG00000143320	CRABP2	6210	-4.999051	5.948139
##	ENSG00000124479	ENSG00000124479	NDP	24619	-5.003038	1.204981
##	ENSG00000139219	ENSG00000139219	COL2A1	31587	-5.005810	2.167174
##	ENSG00000102837	ENSG00000102837	OLFM4	23244	-5.016575	1.536211
##	ENSG00000258947	ENSG00000258947	TUBB3	17369	-5.040333	5.921612
##	ENSG00000078898	ENSG00000078898	BPIFB2	15999	-5.050720	4.129118
##	ENSG00000143194	ENSG00000143194	MAEL	46632	-5.056647	2.138325
##	ENSG00000205420	ENSG00000205420	KRT6A	6081	-5.067988	5.501960
##	ENSG00000107159	ENSG00000107159	CA9	7231	-5.068196	3.356089
##	ENSG00000167656	ENSG00000167656	LY6D	1657	-5.072110	1.686459
##	ENSG00000178919	ENSG00000178919	FOX E1	3491	-5.099697	1.420667
##	ENSG00000198183	ENSG00000198183	BPIFA1	7316	-5.104186	7.898803
##	ENSG00000168621	ENSG00000168621	GDNF	27364	-5.110450	1.078855
##	ENSG00000282988	ENSG00000282988		3698	-5.121576	1.907165

## ENSG00000153294	ENSG00000153294	ADGRF4	36157	-5.123733	2.166890
## ENSG00000169213	ENSG00000169213	RAB3B	82744	-5.128447	3.035408
## ENSG00000007306	ENSG00000007306	CEACAM7	33673	-5.138861	2.275593
## ENSG00000165474	ENSG00000165474	GJB2	5475	-5.174952	4.806229
## ENSG00000080031	ENSG00000080031	PTPRH	28259	-5.193918	3.151831
## ENSG00000277075	ENSG00000277075	H2AC8	516	-5.203665	1.341891
## ENSG00000173404	ENSG00000173404	INSM1	2845	-5.237806	1.758606
## ENSG00000233056	ENSG00000233056	ERVH48-1	8827	-5.261920	1.905444
## ENSG00000171951	ENSG00000171951	SCG2	5421	-5.264878	5.603717
## ENSG00000166105	ENSG00000166105	GLB1L3	45319	-5.267781	3.597253
## ENSG00000183036	ENSG00000183036	PCP4	61959	-5.299913	2.930748
## ENSG00000166923	ENSG00000166923	GREM1	27102	-5.314791	5.388476
## ENSG00000204382	ENSG00000204382	XAGE1B	8726	-5.320939	5.492470
## ENSG00000119547	ENSG00000119547	ONECUT2	55924	-5.324715	1.668603
## ENSG00000137825	ENSG00000137825	ITPKA	10158	-5.344297	2.929042
## ENSG00000163993	ENSG00000163993	S100P	3292	-5.350200	7.181012
## ENSG00000166670	ENSG00000166670	MMP10	10126	-5.360732	3.600016
## ENSG00000015520	ENSG00000015520	NPC1L1	28795	-5.411449	2.322557
## ENSG00000188505	ENSG00000188505	NCCRP1	4920	-5.456547	3.403378
## ENSG00000140297	ENSG00000140297	GCNT3	45364	-5.460079	4.980267
## ENSG00000145920	ENSG00000145920	CPLX2	87711	-5.489975	4.747053
## ENSG00000204379	ENSG00000204379	XAGE1A	5004	-5.510102	5.017198
## ENSG00000118785	ENSG00000118785	SPP1	7865	-5.554560	8.582812
## ENSG00000091513	ENSG00000091513	TF	50601	-5.563604	5.331147
## ENSG00000144452	ENSG00000144452	ABCA12	207084	-5.639773	2.733879
## ENSG00000244122	ENSG00000244122	UGT1A7	91399	-5.675524	5.483971
## ENSG00000131050	ENSG00000131050	BPIFA2	19644	-5.680745	1.758338
## ENSG00000241635	ENSG00000241635	UGT1A1	13030	-5.691071	5.567610
## ENSG00000241119	ENSG00000241119	UGT1A9	101402	-5.693691	5.458079
## ENSG00000244474	ENSG00000244474	UGT1A4	54564	-5.699948	5.484165
## ENSG00000184697	ENSG00000184697	CLDN6	5359	-5.710774	3.169352
## ENSG00000164266	ENSG00000164266	SPINK1	7099	-5.713934	5.728368
## ENSG00000242366	ENSG00000242366	UGT1A8	155667	-5.718640	5.476364
## ENSG00000180818	ENSG00000180818	HOXC10	5214	-5.718662	1.607190
## ENSG00000269741	ENSG00000269741		13563	-5.728773	1.291566
## ENSG00000173227	ENSG00000173227	SYT12	44085	-5.731815	4.237076
## ENSG00000121742	ENSG00000121742	GJB6	10403	-5.745437	1.824838
## ENSG00000149948	ENSG00000149948	HMGA2	141831	-5.757078	3.245585
## ENSG00000074211	ENSG00000074211	PPP2R2C	243022	-5.788242	3.388067
## ENSG00000183971	ENSG00000183971	NPW	10829	-5.789970	1.632473
## ENSG00000242515	ENSG00000242515	UGT1A10	136852	-5.802044	5.624926
## ENSG00000023839	ENSG00000023839	ABCC2	69954	-5.805428	4.221069
## ENSG00000196091	ENSG00000196091	MYBPC1	117675	-5.862080	1.514627
## ENSG00000110680	ENSG00000110680	CALCA	5732	-5.865736	4.280029
## ENSG00000134827	ENSG00000134827	TCN1	13689	-5.899629	3.193448
## ENSG00000166143	ENSG00000166143	PPP1R14D	13258	-5.917507	2.560590
## ENSG00000204936	ENSG00000204936	CD177	9486	-5.919401	5.541615
## ENSG00000173702	ENSG00000173702	MUC13	48377	-5.929374	5.074473
## ENSG00000118322	ENSG00000118322	ATP10B	289094	-5.941189	3.473617
## ENSG00000137948	ENSG00000137948	BRDT	65083	-6.000138	1.527885
## ENSG00000179083	ENSG00000179083	FAM133A	38261	-6.069645	1.869072
## ENSG00000125571	ENSG00000125571	IL37	7717	-6.081761	1.848809
## ENSG00000009709	ENSG00000009709	PAX7	118020	-6.102453	2.383686
## ENSG00000140519	ENSG00000140519	RHCG	25191	-6.132480	2.795116

##	ENSG00000166535	ENSG00000166535	A2ML1	64380	-6.170259	1.846546
##	ENSG00000060718	ENSG00000060718	COL11A1	232405	-6.273588	5.226066
##	ENSG00000101210	ENSG00000101210	EEF1A2	11226	-6.306311	4.797318
##	ENSG00000172927	ENSG00000172927	MYEOV	47531	-6.408642	3.291229
##	ENSG00000130294	ENSG00000130294	KIF1A	110532	-6.464808	5.038415
##	ENSG00000143512	ENSG00000143512	HHIPL2	25846	-6.550541	2.672866
##	ENSG00000136110	ENSG00000136110	CNMD	36556	-6.610266	3.992399
##	ENSG00000021826	ENSG00000021826	CPS1	201425	-6.615628	6.877100
##	ENSG00000144481	ENSG00000144481	TRPM8	102149	-6.629222	1.966871
##	ENSG00000227471	ENSG00000227471	AKR1B15	30765	-6.708030	1.648754
##	ENSG00000087128	ENSG00000087128	TMPRSS11E	50141	-6.749248	2.696576
##	ENSG00000166736	ENSG00000166736	HTR3A	15238	-6.749917	2.535099
##	ENSG00000176153	ENSG00000176153	GPX2	3594	-6.757439	6.574697
##	ENSG00000104760	ENSG00000104760	FGL1	45985	-6.801159	4.491544
##	ENSG00000171759	ENSG00000171759	PAH	121521	-6.839244	2.454948
##	ENSG00000131668	ENSG00000131668	BARX1	3728	-6.888326	2.350203
##	ENSG00000167755	ENSG00000167755	KLK6	11042	-6.889397	2.446732
##	ENSG00000198758	ENSG00000198758	EPS8L3	13947	-6.890571	1.845477
##	ENSG00000178363	ENSG00000178363	CALML3	1810	-6.931174	2.008502
##	ENSG00000276966	ENSG00000276966	H4C5	411	-6.962877	1.969303
##	ENSG00000122133	ENSG00000122133	PAEP	5199	-7.021416	4.764375
##	ENSG00000147689	ENSG00000147689	FAM83A	31119	-7.025276	6.429709
##	ENSG00000175426	ENSG00000175426	PCSK1	43810	-7.042930	5.101820
##	ENSG00000169469	ENSG00000169469	SPRR1B	1697	-7.062462	2.567974
##	ENSG00000137745	ENSG00000137745	MMP13	12737	-7.117605	4.582457
##	ENSG00000142623	ENSG00000142623	PADI1	40879	-7.125981	2.052655
##	ENSG00000128564	ENSG00000128564	VGf	3060	-7.131263	2.626664
##	ENSG00000170373	ENSG00000170373	CST1	3706	-7.148443	5.046146
##	ENSG00000170689	ENSG00000170689	HOXB9	5202	-7.150606	2.686593
##	ENSG00000019186	ENSG00000019186	CYP24A1	20540	-7.159950	5.910784
##	ENSG00000143469	ENSG00000143469	SYT14	270466	-7.187579	1.392533
##	ENSG00000123999	ENSG00000123999	INHA	6549	-7.288101	3.338949
##	ENSG00000159217	ENSG00000159217	IGF2BP1	58760	-7.307337	2.821878
##	ENSG00000089199	ENSG00000089199	CHGB	13843	-7.347113	5.727070
##	ENSG00000205426	ENSG00000205426	KRT81	5621	-7.360550	5.403187
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##	ENSG00000162992	ENSG00000162992	NEUROD1	12532	-7.412440	1.763361
##	ENSG00000111700	ENSG00000111700	SLC01B3	106209	-7.462127	2.425301
##	ENSG00000214336	ENSG00000214336	FOXI3	5906	-7.497568	1.039122
##	ENSG00000197153	ENSG00000197153	H3C12	2791	-7.536352	1.426013
##	ENSG00000185686	ENSG00000185686	PRAME	11660	-7.621119	3.595434
##	ENSG00000109511	ENSG00000109511	ANXA10	95199	-7.642162	2.279456
##	ENSG00000124260	ENSG00000124260	MAGEA10	5268	-7.737030	1.124365
##	ENSG00000257046	ENSG00000257046	SLC01B3-SLC01B7	274571	-7.753127	2.226982
##	ENSG00000183305	ENSG00000183305	MAGEA2B	4021	-7.792412	2.043371
##	ENSG00000006128	ENSG00000006128	TAC1	8388	-7.848436	4.108038
##	ENSG00000198074	ENSG00000198074	AKR1B10	13845	-7.892476	5.919542
##	ENSG00000170454	ENSG00000170454	KRT75	10301	-7.985477	1.620203
##	ENSG00000277157	ENSG00000277157	H4C4	402	-7.992076	1.291412
##	ENSG00000213401	ENSG00000213401	MAGEA12	3912	-8.069913	2.271137
##	ENSG00000198930	ENSG00000198930	CSAG1	6251	-8.186129	1.791317
##	ENSG00000046774	ENSG00000046774	MAGEC2	2948	-8.188529	1.304362
##	ENSG00000168298	ENSG00000168298	H1-4	786	-8.199914	3.327357
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##		F	PValue	FDR	class
##	ENSG00000130234	26.937869	1.079020e-06	2.728162e-06	-
##	ENSG00000139998	69.320705	4.067450e-13	2.499010e-12	-
##	ENSG00000088826	64.145641	1.984204e-12	1.092861e-11	-
##	ENSG00000240972	92.334101	6.137106e-16	6.059647e-15	-
##	ENSG00000085465	63.298344	2.584577e-12	1.405181e-11	-
##	ENSG00000183196	19.530436	2.481383e-05	5.290496e-05	-
##	ENSG00000121380	43.158553	2.183470e-09	7.835206e-09	-
##	ENSG00000112312	115.170464	2.031996e-18	3.317391e-17	-
##	ENSG00000064300	14.811638	2.076678e-04	3.889890e-04	-
##	ENSG00000170779	126.202373	1.597558e-19	3.276415e-18	-
##	ENSG00000139835	140.603417	6.926955e-21	1.764301e-19	-
##	ENSG00000164171	36.812388	2.247604e-08	7.053699e-08	-
##	ENSG00000178852	49.029687	2.778284e-10	1.136899e-09	-
##	ENSG00000137699	11.331604	1.076388e-03	1.832202e-03	-
##	ENSG00000100167	28.236744	6.364275e-07	1.652131e-06	-
##	ENSG00000137747	52.202348	9.444293e-11	4.100512e-10	-
##	ENSG00000185101	65.507049	1.301343e-12	7.388809e-12	-
##	ENSG00000265690	56.027106	2.651909e-11	1.237152e-10	-
##	ENSG00000251357	97.390264	1.637307e-16	1.813414e-15	-
##	ENSG00000248485	15.853814	1.286339e-04	2.477664e-04	-
##	ENSG00000212916	68.463029	5.270942e-13	3.186339e-12	-
##	ENSG00000182199	146.278989	2.117393e-21	6.080999e-20	-
##	ENSG00000136295	92.745558	5.504265e-16	5.469396e-15	-
##	ENSG00000262660	149.928287	1.002504e-21	3.056841e-20	-
##	ENSG00000145908	46.434831	6.836775e-10	2.640067e-09	-
##	ENSG00000141682	41.497635	3.976253e-09	1.373535e-08	-
##	ENSG00000104368	24.245565	3.287806e-06	7.837153e-06	-
##	ENSG00000057294	21.561857	1.026891e-05	2.295567e-05	-
##	ENSG00000183605	143.395158	3.853378e-21	1.047501e-19	-
##	ENSG00000112242	148.376809	1.375788e-21	4.136695e-20	-
##	ENSG00000143578	101.280239	6.062831e-17	7.319852e-16	-
##	ENSG00000160200	51.001915	1.416669e-10	6.011975e-10	-
##	ENSG00000161692	112.188565	4.132926e-18	6.334589e-17	-
##	ENSG00000198648	162.677210	7.996421e-23	3.200234e-21	-
##	ENSG00000176749	126.493499	1.496408e-19	3.090968e-18	-
##	ENSG00000167759	9.123858	3.190921e-03	5.093042e-03	-
##	ENSG00000163689	33.415520	8.215480e-08	2.393620e-07	-
##	ENSG00000259207	28.420475	5.909184e-07	1.538844e-06	-
##	ENSG00000159958	21.152899	1.224715e-05	2.711956e-05	-
##	ENSG00000078269	134.505366	2.554900e-20	6.034382e-19	-
##	ENSG00000205336	90.735675	9.387550e-16	8.952088e-15	-
##	ENSG00000065911	76.412440	5.015163e-14	3.572607e-13	-
##	ENSG00000131941	56.092793	2.595421e-11	1.212108e-10	-
##	ENSG00000198743	60.007713	7.313569e-12	3.717856e-11	-
##	ENSG00000112559	43.904979	1.671834e-09	6.118614e-09	-
##	ENSG00000109654	70.038158	3.277983e-13	2.043008e-12	-
##	ENSG00000164877	122.066528	4.083507e-19	7.682236e-18	-
##	ENSG00000155974	66.038993	1.104668e-12	6.376827e-12	-
##	ENSG00000112699	112.707032	3.650351e-18	5.665253e-17	-
##	ENSG00000159753	56.883525	2.004306e-11	9.543501e-11	-
##	ENSG00000204410	113.422069	3.077403e-18	4.854491e-17	-
##	ENSG00000143850	99.034693	1.073247e-16	1.231279e-15	-
##	ENSG00000128039	95.045015	3.009020e-16	3.135801e-15	-

##	ENSG00000178343	11.364203	1.059542e-03	1.804593e-03	-
##	ENSG00000113569	160.047558	1.333428e-22	5.066735e-21	-
##	ENSG00000153044	140.601998	6.929034e-21	1.764301e-19	-
##	ENSG00000086991	53.447217	6.224005e-11	2.769223e-10	-
##	ENSG00000136883	30.583158	2.489297e-07	6.783962e-07	-
##	ENSG00000162391	88.980951	1.503153e-15	1.376483e-14	-
##	ENSG00000138018	111.100479	5.368548e-18	8.071029e-17	-
##	ENSG00000203668	97.075867	1.775725e-16	1.948002e-15	-
##	ENSG00000232434	83.267366	7.183082e-15	5.800481e-14	-
##	ENSG00000185033	95.688060	2.544716e-16	2.705757e-15	-
##	ENSG00000069764	21.998608	8.514396e-06	1.925008e-05	-
##	ENSG00000123213	219.476080	3.830184e-27	4.191143e-25	-
##	ENSG00000261115	19.108751	2.986990e-05	6.297046e-05	-
##	ENSG00000170417	199.082679	1.092976e-25	8.398430e-24	-
##	ENSG00000132436	171.186731	1.582163e-23	7.255709e-22	-
##	ENSG00000124813	124.889655	2.147849e-19	4.278128e-18	-
##	ENSG00000139880	84.056198	5.771058e-15	4.751230e-14	-
##	ENSG00000198088	61.335688	4.793849e-12	2.518409e-11	-
##	ENSG00000104892	64.993399	1.525203e-12	8.555884e-12	-
##	ENSG00000173917	38.273898	1.300611e-08	4.218546e-08	-
##	ENSG00000143845	95.679150	2.550623e-16	2.710370e-15	-
##	ENSG00000076003	159.991255	1.348184e-22	5.099129e-21	-
##	ENSG00000123131	109.365684	8.169603e-18	1.181960e-16	-
##	ENSG00000143179	55.848301	2.812110e-11	1.306600e-10	-
##	ENSG00000132329	50.493645	1.683717e-10	7.091299e-10	-
##	ENSG00000243509	25.947606	1.620415e-06	4.016539e-06	-
##	ENSG00000197506	21.027633	1.292805e-05	2.856396e-05	-
##	ENSG00000133110	40.967939	4.821459e-09	1.650331e-08	-
##	ENSG00000259753	34.071744	6.377993e-08	1.890760e-07	-
##	ENSG00000130649	21.905440	8.860996e-06	1.997624e-05	-
##	ENSG00000120334	159.388039	1.517118e-22	5.665109e-21	-
##	ENSG00000138182	109.046862	8.828316e-18	1.265612e-16	-
##	ENSG00000140263	115.816278	1.744663e-18	2.880944e-17	-
##	ENSG00000167103	49.044942	2.763750e-10	1.131750e-09	-
##	ENSG00000164466	294.277831	8.751572e-32	1.008706e-28	-
##	ENSG00000173137	117.175641	1.267636e-18	2.154981e-17	-
##	ENSG00000155792	65.904958	1.151171e-12	6.605575e-12	-
##	ENSG00000161267	120.066095	6.470236e-19	1.167682e-17	-
##	ENSG00000242110	46.866634	5.878585e-10	2.287013e-09	-
##	ENSG00000196136	14.036605	2.976862e-04	5.462425e-04	-
##	ENSG00000162073	142.311483	4.834583e-21	1.270290e-19	-
##	ENSG00000259075	72.305096	1.667735e-13	1.086825e-12	-
##	ENSG00000243449	58.234803	1.292698e-11	6.343872e-11	-
##	ENSG00000086548	29.638557	3.624143e-07	9.676883e-07	-
##	ENSG00000109881	69.875301	3.442263e-13	2.139996e-12	-
##	ENSG00000258839	81.809953	1.079019e-14	8.475768e-14	-
##	ENSG00000075213	41.475165	4.008834e-09	1.383408e-08	-
##	ENSG00000145545	106.310355	1.726166e-17	2.338847e-16	-
##	ENSG00000273259	14.214000	2.740512e-04	5.049634e-04	-
##	ENSG00000198937	146.684127	1.947667e-21	5.659364e-20	-
##	ENSG00000125775	45.919106	8.192975e-10	3.113835e-09	-
##	ENSG00000174938	73.545456	1.156679e-13	7.739095e-13	-
##	ENSG00000077264	22.228513	7.717206e-06	1.756025e-05	-
##	ENSG00000278259	293.160920	1.010806e-31	1.092239e-28	-



##	ENSG00000144120	242.923781	1.048670e-28	1.928772e-26	-
##	ENSG00000166428	60.187979	6.904557e-12	3.526526e-11	-
##	ENSG00000105976	39.748015	7.537606e-09	2.515462e-08	-
##	ENSG00000091129	19.075093	3.031641e-05	6.382615e-05	-
##	ENSG00000167702	69.006364	4.472086e-13	2.736917e-12	-
##	ENSG00000164087	132.262656	4.164609e-20	9.473937e-19	-
##	ENSG00000166508	107.625114	1.249366e-17	1.734963e-16	-
##	ENSG00000117122	66.209834	1.048159e-12	6.072927e-12	-
##	ENSG00000113296	16.149184	1.124242e-04	2.182463e-04	-
##	ENSG00000161800	107.850377	1.182294e-17	1.652440e-16	-
##	ENSG00000257594	73.591573	1.141108e-13	7.637869e-13	-
##	ENSG00000114455	9.806579	2.270963e-03	3.696354e-03	-
##	ENSG00000136881	13.000679	4.843663e-04	8.622539e-04	-
##	ENSG00000133710	16.724432	8.659668e-05	1.707149e-04	-
##	ENSG00000133302	47.322399	5.015034e-10	1.971911e-09	-
##	ENSG00000156738	16.379552	1.012452e-04	1.978109e-04	-
##	ENSG00000048462	31.156962	1.984358e-07	5.480441e-07	-
##	ENSG00000152669	23.835323	3.905694e-06	9.221022e-06	-
##	ENSG00000136928	18.597754	3.743777e-05	7.773072e-05	-
##	ENSG00000183486	85.063853	4.369497e-15	3.679700e-14	-
##	ENSG00000117215	23.988661	3.661921e-06	8.667984e-06	-
##	ENSG00000134460	56.053374	2.629171e-11	1.227538e-10	-
##	ENSG00000284505	17.431177	6.298351e-05	1.265012e-04	-
##	ENSG00000049249	35.393595	3.845698e-08	1.172633e-07	-
##	ENSG00000133962	43.120556	2.213436e-09	7.941087e-09	-
##	ENSG00000050344	89.915457	1.169180e-15	1.090289e-14	-
##	ENSG00000204681	53.128904	6.921998e-11	3.059162e-10	-
##	ENSG00000180198	333.233854	7.303101e-34	1.578291e-30	-
##	ENSG00000173207	125.490466	1.875324e-19	3.792102e-18	-
##	ENSG00000134285	119.451948	7.458542e-19	1.322448e-17	-
##	ENSG00000261236	168.901670	2.432217e-23	1.051265e-21	-
##	ENSG00000143630	155.629218	3.185817e-22	1.099393e-20	-
##	ENSG00000203814	36.195976	2.836211e-08	8.790829e-08	-
##	ENSG00000160072	125.695992	1.790418e-19	3.633163e-18	-
##	ENSG00000265817	101.745763	5.390232e-17	6.548961e-16	-
##	ENSG00000152256	182.306693	2.053056e-24	1.159474e-22	-
##	ENSG00000164379	25.192726	2.214703e-06	5.399802e-06	-
##	ENSG00000101412	103.132182	3.803813e-17	4.803808e-16	-
##	ENSG00000164237	41.965775	3.355624e-09	1.170609e-08	-
##	ENSG00000203760	72.448380	1.598490e-13	1.044456e-12	-
##	ENSG00000013573	92.009903	6.687699e-16	6.550913e-15	-
##	ENSG00000022556	19.851524	2.155771e-05	4.630529e-05	-
##	ENSG00000115758	29.652529	3.603985e-07	9.626030e-07	-
##	ENSG00000049768	100.141004	8.093838e-17	9.499957e-16	-
##	ENSG00000101463	38.639645	1.135312e-08	3.704871e-08	-
##	ENSG00000101825	64.139622	1.987923e-12	1.094561e-11	-
##	ENSG00000165568	58.576073	1.157869e-11	5.718388e-11	-
##	ENSG00000137261	21.075624	1.266272e-05	2.800279e-05	-
##	ENSG00000104833	63.652114	2.314098e-12	1.265689e-11	-
##	ENSG00000277363	44.093114	1.563389e-09	5.733865e-09	-
##	ENSG00000273604	65.006558	1.519004e-12	8.523875e-12	-
##	ENSG00000157766	36.739657	2.310009e-08	7.240345e-08	-
##	ENSG00000083454	55.059368	3.645790e-11	1.667634e-10	-
##	ENSG00000149418	149.497692	1.094339e-21	3.330991e-20	-

##	ENSG00000161682	45.942211	8.126706e-10	3.091367e-09	-
##	ENSG00000196407	76.373449	5.072014e-14	3.610130e-13	-
##	ENSG00000121039	47.744354	4.331044e-10	1.719728e-09	-
##	ENSG00000197275	110.162744	6.733387e-18	9.941378e-17	-
##	ENSG00000109586	163.245701	7.164401e-23	2.880589e-21	-
##	ENSG00000108984	49.394934	2.450767e-10	1.010525e-09	-
##	ENSG00000132185	26.476574	1.303461e-06	3.265546e-06	-
##	ENSG00000110777	43.172247	2.172772e-09	7.798434e-09	-
##	ENSG00000108773	195.474458	2.025027e-25	1.482178e-23	-
##	ENSG00000149256	86.939521	2.613933e-15	2.288217e-14	-
##	ENSG00000169241	157.655351	2.132834e-22	7.666232e-21	-
##	ENSG00000204128	25.719510	1.780443e-06	4.391166e-06	-
##	ENSG00000093217	134.600953	2.502506e-20	5.938548e-19	-
##	ENSG00000157193	51.232052	1.310375e-10	5.585500e-10	-
##	ENSG00000136457	27.756943	7.729265e-07	1.987377e-06	-
##	ENSG00000146858	124.714121	2.234858e-19	4.431016e-18	-
##	ENSG00000134317	85.067009	4.365702e-15	3.678295e-14	-
##	ENSG00000160973	64.560980	1.743944e-12	9.694870e-12	-
##	ENSG00000169851	35.183927	4.165520e-08	1.263896e-07	-
##	ENSG00000175928	29.068119	4.553643e-07	1.200487e-06	-
##	ENSG00000008735	39.132237	9.459596e-09	3.114587e-08	-
##	ENSG00000110660	158.141497	1.937980e-22	7.068721e-21	-
##	ENSG00000116191	198.042759	1.304564e-25	9.849173e-24	-
##	ENSG00000171163	109.972654	7.050659e-18	1.035962e-16	-
##	ENSG00000101255	65.105072	1.473403e-12	8.276043e-12	-
##	ENSG00000146242	102.505513	4.451618e-17	5.513183e-16	-
##	ENSG00000096063	319.813200	3.611625e-33	5.676489e-30	-
##	ENSG00000175305	175.101648	7.637200e-24	3.805175e-22	-
##	ENSG00000124787	162.587442	8.136539e-23	3.241305e-21	-
##	ENSG00000125885	162.219742	8.737116e-23	3.456659e-21	-
##	ENSG00000115457	33.576321	7.720344e-08	2.260950e-07	-
##	ENSG00000205560	60.409446	6.433829e-12	3.306613e-11	-
##	ENSG00000146410	71.871731	1.896377e-13	1.225204e-12	-
##	ENSG00000004848	12.506475	6.124040e-04	1.076658e-03	-
##	ENSG00000138336	68.051521	5.971796e-13	3.588682e-12	-
##	ENSG00000175352	46.132600	7.601029e-10	2.908681e-09	-
##	ENSG00000273294	47.015787	5.580428e-10	2.179847e-09	-
##	ENSG00000185090	116.755512	1.398857e-18	2.354901e-17	-
##	ENSG00000197520	37.933331	1.476611e-08	4.755798e-08	-
##	ENSG00000106278	22.429109	7.084135e-06	1.619646e-05	-
##	ENSG00000196793	142.018818	5.140926e-21	1.338576e-19	-
##	ENSG00000013810	192.424037	3.430966e-25	2.363266e-23	-
##	ENSG00000119888	186.326719	1.000884e-24	6.158109e-23	-
##	ENSG00000104951	101.296826	6.037454e-17	7.294308e-16	-
##	ENSG00000054938	28.089317	6.755245e-07	1.748898e-06	-
##	ENSG00000059573	288.753373	1.792153e-31	1.401548e-28	-
##	ENSG00000187840	69.459712	3.900615e-13	2.400773e-12	-
##	ENSG00000012048	106.483728	1.653933e-17	2.253337e-16	-
##	ENSG00000073605	72.810755	1.436157e-13	9.484231e-13	-
##	ENSG00000101443	57.247294	1.780424e-11	8.543367e-11	-
##	ENSG00000023909	55.760342	2.894508e-11	1.343080e-10	-
##	ENSG00000120322	36.798580	2.259318e-08	7.087889e-08	-
##	ENSG00000175600	61.685709	4.291326e-12	2.270279e-11	-
##	ENSG00000278318	59.898539	7.573215e-12	3.837436e-11	-

##	ENSG00000110400	84.762808	4.747429e-15	3.963221e-14	-
##	ENSG00000108582	86.696892	2.792738e-15	2.435132e-14	-
##	ENSG00000108106	111.046708	5.438586e-18	8.169220e-17	-
##	ENSG00000046604	91.663094	7.332678e-16	7.134197e-15	-
##	ENSG00000167157	47.237056	5.166269e-10	2.025219e-09	-
##	ENSG00000164825	14.057408	2.948095e-04	5.413086e-04	-
##	ENSG00000154102	36.746281	2.304253e-08	7.223612e-08	-
##	ENSG00000157470	60.279387	6.706152e-12	3.434321e-11	-
##	ENSG00000196550	72.803845	1.439089e-13	9.496342e-13	-
##	ENSG00000197753	384.191546	2.572096e-36	1.482299e-32	-
##	ENSG00000163013	139.772812	8.258379e-21	2.075278e-19	-
##	ENSG00000054179	42.279416	2.995985e-09	1.052369e-08	-
##	ENSG00000150551	77.912341	3.256876e-14	2.401200e-13	-
##	ENSG00000176890	161.124699	1.080772e-22	4.198980e-21	-
##	ENSG00000153132	32.220904	1.307110e-07	3.711994e-07	-
##	ENSG00000134013	53.820461	5.496279e-11	2.459243e-10	-
##	ENSG00000149380	139.749092	8.300021e-21	2.082715e-19	-
##	ENSG00000178222	36.264773	2.763373e-08	8.581993e-08	-
##	ENSG00000172382	48.160612	3.749361e-10	1.503309e-09	-
##	ENSG00000111640	168.249442	2.751687e-23	1.180494e-21	-
##	ENSG00000170927	24.818133	2.588201e-06	6.255755e-06	-
##	ENSG00000149328	69.509362	3.842732e-13	2.366833e-12	-
##	ENSG00000151640	32.125942	1.356530e-07	3.847284e-07	-
##	ENSG00000105369	39.520073	8.197709e-09	2.719827e-08	-
##	ENSG00000197893	21.571293	1.022734e-05	2.286865e-05	-
##	ENSG00000157214	67.629570	6.789519e-13	4.044934e-12	-
##	ENSG00000088882	47.257960	5.128800e-10	2.011611e-09	-
##	ENSG00000124766	200.341542	8.829428e-26	6.970410e-24	-
##	ENSG00000160606	123.630061	2.857987e-19	5.558125e-18	-
##	ENSG00000163462	79.861623	1.868681e-14	1.420116e-13	-
##	ENSG00000197261	39.862458	7.226904e-09	2.417684e-08	-
##	ENSG00000115255	65.872147	1.162856e-12	6.658440e-12	-
##	ENSG00000249992	48.809495	2.996985e-10	1.217455e-09	-
##	ENSG00000158477	16.966750	7.761923e-05	1.541950e-04	-
##	ENSG00000198431	59.617392	8.286022e-12	4.179027e-11	-
##	ENSG00000130762	287.813438	2.026647e-31	1.401548e-28	-
##	ENSG00000176208	169.302020	2.255113e-23	9.820819e-22	-
##	ENSG00000177455	31.862476	1.503878e-07	4.235995e-07	-
##	ENSG00000160211	48.946523	2.858905e-10	1.166846e-09	-
##	ENSG00000142552	83.262735	7.192340e-15	5.803234e-14	-
##	ENSG00000079385	107.144374	1.405788e-17	1.941268e-16	-
##	ENSG00000108551	34.571256	5.264820e-08	1.575618e-07	-
##	ENSG00000115226	65.707341	1.223406e-12	6.994531e-12	-
##	ENSG00000198286	88.230024	1.841134e-15	1.651861e-14	-
##	ENSG00000038427	64.734592	1.652513e-12	9.213253e-12	-
##	ENSG00000113368	152.076584	6.488562e-22	2.077421e-20	-
##	ENSG00000170476	44.969730	1.145200e-09	4.272629e-09	-
##	ENSG00000139629	69.031367	4.438448e-13	2.719218e-12	-
##	ENSG00000151725	166.825828	3.606113e-23	1.505944e-21	-
##	ENSG00000128050	273.099930	1.445581e-30	6.707829e-28	-
##	ENSG00000006118	115.664558	1.808209e-18	2.968862e-17	-
##	ENSG00000182704	81.198263	1.281235e-14	9.969069e-14	-
##	ENSG00000143476	83.316115	7.086382e-15	5.730424e-14	-
##	ENSG00000143324	175.803718	6.709435e-24	3.372076e-22	-

##	ENSG00000134762	10.957092	1.290942e-03	2.175350e-03	-
##	ENSG00000116031	17.451635	6.240800e-05	1.254181e-04	-
##	ENSG00000156802	147.959202	1.498649e-21	4.482723e-20	-
##	ENSG00000215788	93.734987	4.240918e-16	4.292812e-15	-
##	ENSG00000099958	71.650095	2.025429e-13	1.302740e-12	-
##	ENSG00000198554	183.586769	1.631422e-24	9.370650e-23	-
##	ENSG00000064195	35.748547	3.360262e-08	1.030430e-07	-
##	ENSG00000185100	78.851511	2.490145e-14	1.868582e-13	-
##	ENSG00000163535	114.312695	2.489858e-18	4.008115e-17	-
##	ENSG00000070526	48.384631	3.469962e-10	1.398419e-09	-
##	ENSG00000081277	22.380454	7.232637e-06	1.652068e-05	-
##	ENSG00000102878	65.372021	1.356727e-12	7.666516e-12	-
##	ENSG00000100625	68.775935	4.794607e-13	2.915721e-12	-
##	ENSG00000165215	64.135911	1.990220e-12	1.095477e-11	-
##	ENSG00000188158	77.253501	3.935099e-14	2.852575e-13	-
##	ENSG00000105929	23.163557	5.185567e-06	1.206639e-05	-
##	ENSG00000128059	252.902192	2.442618e-29	5.706814e-27	-
##	ENSG00000005001	88.193080	1.859636e-15	1.665005e-14	-
##	ENSG00000127586	156.930828	2.461011e-22	8.665664e-21	-
##	ENSG00000259316	145.706708	2.383203e-21	6.799208e-20	-
##	ENSG00000168528	132.894231	3.627508e-20	8.317771e-19	-
##	ENSG00000143546	14.701991	2.184764e-04	4.080413e-04	-
##	ENSG00000148702	21.746689	9.485188e-06	2.129733e-05	-
##	ENSG00000130635	85.233921	4.169703e-15	3.525183e-14	-
##	ENSG00000111602	208.397728	2.300848e-26	2.104728e-24	-
##	ENSG00000130487	58.744444	1.096724e-11	5.429914e-11	-
##	ENSG00000183734	41.411297	4.102936e-09	1.413906e-08	-
##	ENSG00000136982	103.970900	3.084197e-17	3.964512e-16	-
##	ENSG00000172818	74.193666	9.563679e-14	6.481632e-13	-
##	ENSG00000159259	222.335032	2.435899e-27	2.924601e-25	-
##	ENSG00000243649	58.582856	1.155340e-11	5.708681e-11	-
##	ENSG00000049089	62.066328	3.805537e-12	2.025675e-11	-
##	ENSG00000100162	77.270374	3.916046e-14	2.841146e-13	-
##	ENSG00000127129	25.053135	2.346982e-06	5.701416e-06	-
##	ENSG00000146918	201.750410	6.960993e-26	5.650170e-24	-
##	ENSG00000127324	32.050906	1.396927e-07	3.954720e-07	-
##	ENSG00000150201	16.921636	7.921528e-05	1.571490e-04	-
##	ENSG00000159166	150.244408	9.401169e-22	2.886977e-20	-
##	ENSG00000165434	163.342564	7.031696e-23	2.847096e-21	-
##	ENSG00000132704	36.681486	2.361192e-08	7.384703e-08	-
##	ENSG00000272398	70.065076	3.251611e-13	2.030231e-12	-
##	ENSG00000176788	76.947955	4.296962e-14	3.095424e-13	-
##	ENSG00000163220	24.941259	2.458813e-06	5.961354e-06	-
##	ENSG00000007062	19.399680	2.628027e-05	5.585244e-05	-
##	ENSG00000155660	263.160705	5.697768e-30	2.010382e-27	-
##	ENSG00000181649	71.292884	2.252572e-13	1.437605e-12	-
##	ENSG00000183248	86.117110	3.272283e-15	2.820264e-14	-
##	ENSG00000135245	59.676255	8.131322e-12	4.106994e-11	-
##	ENSG00000157833	92.671871	5.612500e-16	5.567097e-15	-
##	ENSG00000088836	48.442882	3.400856e-10	1.372081e-09	-
##	ENSG00000187837	77.227711	3.964405e-14	2.869008e-13	-
##	ENSG00000151715	128.157827	1.031229e-19	2.187598e-18	-
##	ENSG00000132821	35.867544	3.211914e-08	9.877407e-08	-
##	ENSG00000142102	49.099292	2.712593e-10	1.111855e-09	-

##	ENSG00000197714	33.275642	8.672521e-08	2.517448e-07	-
##	ENSG00000172244	160.083660	1.324054e-22	5.042196e-21	-
##	ENSG00000150556	34.356387	5.717086e-08	1.702324e-07	-
##	ENSG00000129910	43.697305	1.800489e-09	6.550643e-09	-
##	ENSG00000146530	37.385555	1.812286e-08	5.771341e-08	-
##	ENSG00000067057	121.866432	4.275093e-19	7.999143e-18	-
##	ENSG00000087085	49.621127	2.267965e-10	9.380584e-10	-
##	ENSG00000135318	64.766154	1.636424e-12	9.132389e-12	-
##	ENSG00000003249	129.978128	6.884300e-20	1.506616e-18	-
##	ENSG00000139572	61.117382	5.137287e-12	2.681720e-11	-
##	ENSG00000088305	122.356417	3.821356e-19	7.212601e-18	-
##	ENSG00000127564	203.462835	5.221667e-26	4.491413e-24	-
##	ENSG00000172061	45.143882	1.076781e-09	4.028665e-09	-
##	ENSG00000130768	87.364130	2.328608e-15	2.048819e-14	-
##	ENSG00000111432	21.259201	1.169816e-05	2.595937e-05	-
##	ENSG00000064787	37.929429	1.478762e-08	4.760954e-08	-
##	ENSG00000015413	21.691265	9.713553e-06	2.177897e-05	-
##	ENSG00000135925	41.512190	3.955294e-09	1.367661e-08	-
##	ENSG00000156510	77.564543	3.598582e-14	2.629581e-13	-
##	ENSG00000182481	162.362936	8.498034e-23	3.369782e-21	-
##	ENSG00000100197	71.846958	1.910376e-13	1.232406e-12	-
##	ENSG00000134339	17.697963	5.588689e-05	1.132874e-04	-
##	ENSG00000165376	17.793942	5.353884e-05	1.088468e-04	-
##	ENSG00000197930	224.688851	1.683192e-27	2.171694e-25	-
##	ENSG00000255071	17.948828	4.996070e-05	1.019800e-04	-
##	ENSG00000104415	98.286464	1.300084e-16	1.467177e-15	-
##	ENSG00000187017	57.851059	1.463578e-11	7.112593e-11	-
##	ENSG00000132429	20.274179	1.792641e-05	3.885292e-05	-
##	ENSG00000130821	104.847048	2.479724e-17	3.240510e-16	-
##	ENSG00000130701	81.486056	1.181677e-14	9.240168e-14	-
##	ENSG00000258472	202.403671	6.236701e-26	5.234288e-24	-
##	ENSG00000070669	93.810704	4.157366e-16	4.219996e-15	-
##	ENSG00000179750	62.262323	3.577650e-12	1.909663e-11	-
##	ENSG00000162063	257.325838	1.297287e-29	3.564335e-27	-
##	ENSG00000174607	46.129751	7.608636e-10	2.910947e-09	-
##	ENSG00000187045	32.963008	9.790262e-08	2.823888e-07	-
##	ENSG00000008323	110.975027	5.533404e-18	8.297227e-17	-
##	ENSG00000141756	66.902381	8.476733e-13	4.961213e-12	-
##	ENSG00000186891	114.032189	2.661410e-18	4.252598e-17	-
##	ENSG00000221947	62.868187	2.957380e-12	1.595822e-11	-
##	ENSG00000146674	73.155877	1.297180e-13	8.606568e-13	-
##	ENSG00000101104	97.957725	1.414679e-16	1.583067e-15	-
##	ENSG00000159231	52.711437	7.960193e-11	3.486794e-10	-
##	ENSG00000204839	111.174456	5.273692e-18	7.949160e-17	-
##	ENSG00000149260	85.875643	3.496047e-15	2.998173e-14	-
##	ENSG00000248144	20.209024	1.844252e-05	3.991146e-05	-
##	ENSG00000067715	39.205085	9.208292e-09	3.036471e-08	-
##	ENSG00000176490	47.240789	5.159557e-10	2.023216e-09	-
##	ENSG00000064655	30.669952	2.405213e-07	6.566035e-07	-
##	ENSG00000183048	231.265672	6.077254e-28	9.381217e-26	-
##	ENSG00000269404	33.188387	8.970692e-08	2.599636e-07	-
##	ENSG00000156804	140.555559	6.997365e-21	1.779080e-19	-
##	ENSG00000243364	262.656224	6.114654e-30	2.062367e-27	-
##	ENSG00000170775	73.426521	1.197844e-13	7.983628e-13	-

##	ENSG00000145247	241.493799	1.296665e-28	2.335213e-26	-
##	ENSG00000120875	72.930912	1.386125e-13	9.171343e-13	-
##	ENSG00000146205	104.645765	2.606946e-17	3.393937e-16	-
##	ENSG00000042980	116.514932	1.480156e-18	2.482096e-17	-
##	ENSG00000267881	51.864861	1.058111e-10	4.559739e-10	-
##	ENSG00000160949	179.369373	3.493101e-24	1.869728e-22	-
##	ENSG00000163362	182.377534	2.027048e-24	1.149037e-22	-
##	ENSG00000188107	66.531331	9.496805e-13	5.528291e-12	-
##	ENSG00000196632	56.920554	1.980260e-11	9.436799e-11	-
##	ENSG00000165238	55.602507	3.048592e-11	1.412302e-10	-
##	ENSG00000254709	58.127860	1.338166e-11	6.544708e-11	-
##	ENSG00000151224	32.728111	1.072608e-07	3.075854e-07	-
##	ENSG00000185156	46.086311	7.725557e-10	2.950456e-09	-
##	ENSG00000145194	177.133328	5.254759e-24	2.703855e-22	-
##	ENSG00000164694	60.269414	6.727514e-12	3.443221e-11	-
##	ENSG00000169750	154.277787	4.170872e-22	1.405657e-20	-
##	ENSG00000169962	97.334985	1.660822e-16	1.837105e-15	-
##	ENSG00000034053	89.007400	1.492475e-15	1.368155e-14	-
##	ENSG00000204262	103.817766	3.204371e-17	4.101141e-16	-
##	ENSG00000239672	226.958126	1.181606e-27	1.608566e-25	-
##	ENSG00000137968	35.724259	3.391391e-08	1.039237e-07	-
##	ENSG00000152952	93.693191	4.287770e-16	4.337698e-15	-
##	ENSG00000275004	106.135630	1.802221e-17	2.434266e-16	-
##	ENSG00000106236	32.998250	9.657232e-08	2.787842e-07	-
##	ENSG00000138615	45.784061	8.591503e-10	3.255995e-09	-
##	ENSG00000163507	137.439582	1.357702e-20	3.306100e-19	-
##	ENSG00000185842	198.215377	1.266746e-25	9.605602e-24	-
##	ENSG00000196074	55.925997	2.741319e-11	1.275765e-10	-
##	ENSG00000101134	58.943858	1.028547e-11	5.112865e-11	-
##	ENSG00000228278	27.505425	8.560892e-07	2.192730e-06	-
##	ENSG00000213886	55.396140	3.262763e-11	1.503863e-10	-
##	ENSG00000135100	60.600213	6.054653e-12	3.123810e-11	-
##	ENSG00000164611	212.710830	1.136193e-26	1.073129e-24	-
##	ENSG00000188368	235.537836	3.169584e-28	5.093134e-26	-
##	ENSG00000166823	87.326256	2.352714e-15	2.068976e-14	-
##	ENSG00000123219	153.898078	4.500018e-22	1.501946e-20	-
##	ENSG00000260027	87.576973	2.197744e-15	1.944565e-14	-
##	ENSG00000145536	42.296751	2.977295e-09	1.046441e-08	-
##	ENSG00000135127	94.017801	3.937309e-16	4.030321e-15	-
##	ENSG00000171124	108.181912	1.090194e-17	1.541158e-16	-
##	ENSG00000153292	37.509081	1.730344e-08	5.524639e-08	-
##	ENSG00000105131	93.011614	5.130878e-16	5.118739e-15	-
##	ENSG00000137285	73.197464	1.281387e-13	8.514179e-13	-
##	ENSG00000105737	35.411433	3.819674e-08	1.165314e-07	-
##	ENSG00000079462	283.774014	3.449562e-31	2.056534e-28	-
##	ENSG00000115657	146.134992	2.181289e-21	6.254115e-20	-
##	ENSG00000115641	150.107824	9.665712e-22	2.952482e-20	-
##	ENSG00000177679	99.923406	8.554675e-17	9.993363e-16	-
##	ENSG00000183091	48.738115	3.071590e-10	1.245420e-09	-
##	ENSG00000073111	182.290976	2.058872e-24	1.159474e-22	-
##	ENSG00000271303	64.468334	1.794830e-12	9.958541e-12	-
##	ENSG00000154269	43.256971	2.107764e-09	7.579269e-09	-
##	ENSG00000270299	64.523024	1.764611e-12	9.803458e-12	-
##	ENSG00000185269	20.992368	1.312664e-05	2.898421e-05	-

##	ENSG00000158406	112.262564	4.060255e-18	6.228726e-17	-
##	ENSG00000109956	42.545985	2.721355e-09	9.621577e-09	-
##	ENSG00000158825	47.484114	4.740731e-10	1.872062e-09	-
##	ENSG00000129195	151.516162	7.265741e-22	2.296479e-20	-
##	ENSG00000174123	42.980514	2.327551e-09	8.317699e-09	-
##	ENSG00000102109	33.805649	7.066380e-08	2.082691e-07	-
##	ENSG00000203499	192.929376	3.142804e-25	2.190965e-23	-
##	ENSG00000185480	137.932922	1.221730e-20	2.996097e-19	-
##	ENSG00000115163	150.122747	9.636443e-22	2.948752e-20	-
##	ENSG00000101447	99.004115	1.081675e-16	1.240124e-15	-
##	ENSG00000096696	99.846402	8.724096e-17	1.014330e-15	-
##	ENSG00000122966	67.558926	6.937199e-13	4.124389e-12	-
##	ENSG00000187715	50.233880	1.839510e-10	7.702420e-10	-
##	ENSG00000129437	17.289516	6.712065e-05	1.343423e-04	-
##	ENSG00000170439	83.982452	5.890124e-15	4.846947e-14	-
##	ENSG00000159228	56.184752	2.518396e-11	1.177408e-10	-
##	ENSG00000056998	113.777212	2.827799e-18	4.493550e-17	-
##	ENSG00000104738	220.183641	3.423021e-27	3.842896e-25	-
##	ENSG00000100479	202.093902	6.570049e-26	5.434908e-24	-
##	ENSG00000135119	119.447928	7.465494e-19	1.322448e-17	-
##	ENSG00000126778	48.046994	3.899737e-10	1.559263e-09	-
##	ENSG00000154545	92.271303	6.240024e-16	6.143723e-15	-
##	ENSG00000177301	27.995417	7.016977e-07	1.814124e-06	-
##	ENSG00000163923	120.039543	6.510068e-19	1.171203e-17	-
##	ENSG00000101194	112.918791	3.470155e-18	5.434375e-17	-
##	ENSG00000141696	140.107486	7.693047e-21	1.944519e-19	-
##	ENSG00000140451	159.236974	1.562708e-22	5.810250e-21	-
##	ENSG00000114346	199.363983	1.041999e-25	8.042461e-24	-
##	ENSG00000157064	45.010058	1.128972e-09	4.213901e-09	-
##	ENSG00000198807	48.203675	3.693925e-10	1.482802e-09	-
##	ENSG00000163755	181.923724	2.199668e-24	1.234742e-22	-
##	ENSG00000169783	71.029124	2.436839e-13	1.546074e-12	-
##	ENSG00000174564	65.998747	1.118426e-12	6.443341e-12	-
##	ENSG00000143847	84.846341	4.639336e-15	3.880478e-14	-
##	ENSG00000167767	130.299512	6.412394e-20	1.410482e-18	-
##	ENSG00000173432	24.064650	3.546938e-06	8.410781e-06	-
##	ENSG00000188610	109.313580	8.273724e-18	1.195024e-16	-
##	ENSG00000082196	33.921932	6.756675e-08	1.995834e-07	-
##	ENSG00000237988	39.941025	7.021199e-09	2.352054e-08	-
##	ENSG00000185467	74.072768	9.908424e-14	6.696902e-13	-
##	ENSG00000174939	85.278013	4.119441e-15	3.487807e-14	-
##	ENSG00000111247	145.129638	2.685791e-21	7.525873e-20	-
##	ENSG00000270885	41.836500	3.516411e-09	1.223244e-08	-
##	ENSG00000213937	45.285889	1.024086e-09	3.839822e-09	-
##	ENSG00000143297	74.356845	9.117668e-14	6.218357e-13	-
##	ENSG00000162433	82.702797	8.406161e-15	6.722207e-14	-
##	ENSG00000137563	61.571711	4.448802e-12	2.346410e-11	-
##	ENSG00000007968	174.387122	8.716223e-24	4.293298e-22	-
##	ENSG00000100985	68.602889	5.052336e-13	3.059539e-12	-
##	ENSG00000151790	57.597689	1.588877e-11	7.671069e-11	-
##	ENSG00000171346	53.404247	6.313871e-11	2.804741e-10	-
##	ENSG00000009694	41.898866	3.437883e-09	1.196890e-08	-
##	ENSG00000103888	66.182880	1.056874e-12	6.121374e-12	-
##	ENSG00000198826	143.376125	3.868727e-21	1.050022e-19	-

##	ENSG00000229314	29.268594	4.202006e-07	1.113387e-06	-
##	ENSG00000143217	207.190933	2.807996e-26	2.528513e-24	-
##	ENSG00000178445	59.360598	8.996843e-12	4.508592e-11	-
##	ENSG00000197299	213.310151	1.030877e-26	9.901576e-25	-
##	ENSG00000248771	31.205123	1.947054e-07	5.386017e-07	-
##	ENSG00000188322	116.968446	1.330703e-18	2.244540e-17	-
##	ENSG00000146013	32.694330	1.086799e-07	3.115514e-07	-
##	ENSG00000198598	123.197392	3.153812e-19	6.079735e-18	-
##	ENSG00000149554	200.051589	9.273518e-26	7.287721e-24	-
##	ENSG00000196917	37.084582	2.028935e-08	6.409329e-08	-
##	ENSG00000051180	173.230731	1.080273e-23	5.116942e-22	-
##	ENSG00000106541	95.082591	2.979649e-16	3.107066e-15	-
##	ENSG00000214756	58.474771	1.196323e-11	5.897700e-11	-
##	ENSG00000100558	238.885698	1.914114e-28	3.244424e-26	-
##	ENSG00000152049	60.415900	6.420614e-12	3.301784e-11	-
##	ENSG00000178623	84.948465	4.510589e-15	3.785611e-14	-
##	ENSG00000197837	59.305618	9.156946e-12	4.583510e-11	-
##	ENSG00000138346	205.276127	3.857974e-26	3.345218e-24	-
##	ENSG00000121895	90.895455	8.995602e-16	8.597289e-15	-
##	ENSG00000156234	34.199184	6.072950e-08	1.803112e-07	-
##	ENSG00000171241	170.335715	1.856168e-23	8.270950e-22	-
##	ENSG00000184408	73.752604	1.088394e-13	7.307668e-13	-
##	ENSG00000196139	42.424759	2.842912e-09	1.002674e-08	-
##	ENSG00000240204	55.211420	3.467474e-11	1.591236e-10	-
##	ENSG00000145386	199.392891	1.036899e-25	8.038991e-24	-
##	ENSG00000130383	118.258288	9.843268e-19	1.703506e-17	-
##	ENSG00000155066	160.533041	1.212835e-22	4.649379e-21	-
##	ENSG00000124102	27.788635	7.630502e-07	1.965198e-06	-
##	ENSG00000180287	37.027638	2.072811e-08	6.533606e-08	-
##	ENSG00000165731	37.089730	2.025015e-08	6.398116e-08	-
##	ENSG00000153253	30.228787	2.864978e-07	7.737050e-07	-
##	ENSG00000104147	159.810627	1.396655e-22	5.260733e-21	-
##	ENSG00000141934	130.963636	5.538966e-20	1.235654e-18	-
##	ENSG00000136943	61.326336	4.808070e-12	2.525113e-11	-
##	ENSG00000147697	88.028234	1.944535e-15	1.733835e-14	-
##	ENSG00000070182	82.410263	9.121477e-15	7.270687e-14	-
##	ENSG00000146197	71.570320	2.074042e-13	1.333015e-12	-
##	ENSG00000181143	26.369349	1.362143e-06	3.404669e-06	-
##	ENSG00000091137	31.817078	1.530873e-07	4.307822e-07	-
##	ENSG00000135454	70.017050	3.298817e-13	2.054512e-12	-
##	ENSG00000148346	52.007414	1.008479e-10	4.359990e-10	-
##	ENSG00000119969	232.397096	5.110732e-28	7.960311e-26	-
##	ENSG00000108309	46.072468	7.763200e-10	2.962869e-09	-
##	ENSG00000068489	139.789646	8.228955e-21	2.070894e-19	-
##	ENSG00000073150	102.449145	4.515146e-17	5.579868e-16	-
##	ENSG00000138316	119.871828	6.767511e-19	1.212471e-17	-
##	ENSG00000132437	24.238170	3.298009e-06	7.860390e-06	-
##	ENSG00000152253	146.846220	1.883707e-21	5.501252e-20	-
##	ENSG00000181218	69.789783	3.531867e-13	2.190974e-12	-
##	ENSG00000138798	75.407394	6.711566e-14	4.671347e-13	-
##	ENSG00000185760	58.806510	1.075024e-11	5.330108e-11	-
##	ENSG00000029153	116.600369	1.450746e-18	2.437507e-17	-
##	ENSG00000164045	151.350794	7.512743e-22	2.353040e-20	-
##	ENSG00000103089	97.301185	1.675369e-16	1.849646e-15	-



##	ENSG00000188766	91.548039	7.560392e-16	7.343349e-15	-
##	ENSG00000103460	93.925114	4.034288e-16	4.107704e-15	-
##	ENSG00000137573	106.796560	1.531298e-17	2.092854e-16	-
##	ENSG00000155754	95.972943	2.363040e-16	2.532833e-15	-
##	ENSG00000152766	127.613064	1.164527e-19	2.446356e-18	-
##	ENSG00000132840	43.579172	1.878138e-09	6.811650e-09	-
##	ENSG00000170312	170.026315	1.967391e-23	8.655017e-22	-
##	ENSG00000115828	69.636398	3.698586e-13	2.286194e-12	-
##	ENSG00000078098	107.335318	1.341398e-17	1.858287e-16	-
##	ENSG00000085999	219.649882	3.725805e-27	4.129195e-25	-
##	ENSG00000135052	268.354859	2.769559e-30	1.064065e-27	-
##	ENSG00000196876	122.847317	3.415913e-19	6.547420e-18	-
##	ENSG00000173894	87.660260	2.148600e-15	1.905959e-14	-
##	ENSG00000108846	153.311351	5.061553e-22	1.670023e-20	-
##	ENSG00000144485	107.876247	1.174830e-17	1.643337e-16	-
##	ENSG00000162931	83.585630	6.575211e-15	5.345780e-14	-
##	ENSG00000158315	178.970786	3.755941e-24	1.991916e-22	-
##	ENSG00000106462	286.730179	2.336065e-31	1.553394e-28	-
##	ENSG00000172031	102.721650	4.216360e-17	5.259499e-16	-
##	ENSG00000145113	55.863170	2.798420e-11	1.300588e-10	-
##	ENSG00000137309	173.555784	1.016938e-23	4.876839e-22	-
##	ENSG00000165905	170.772226	1.710055e-23	7.739567e-22	-
##	ENSG00000205213	243.461551	9.684320e-29	1.819915e-26	-
##	ENSG00000133477	43.807477	1.731026e-09	6.315193e-09	-
##	ENSG00000215784	117.030588	1.311459e-18	2.222923e-17	-
##	ENSG00000087586	193.867369	2.671611e-25	1.893011e-23	-
##	ENSG00000087494	57.085867	1.876444e-11	8.969269e-11	-
##	ENSG00000136531	28.354084	6.069664e-07	1.578734e-06	-
##	ENSG00000133216	130.198827	6.556577e-20	1.440364e-18	-
##	ENSG00000122952	208.910626	2.114578e-26	1.955023e-24	-
##	ENSG00000169258	217.109891	5.587760e-27	5.926797e-25	-
##	ENSG00000134028	67.260367	7.598426e-13	4.497404e-12	-
##	ENSG00000140534	166.656297	3.724488e-23	1.547901e-21	-
##	ENSG00000123473	218.613759	4.393921e-27	4.718416e-25	-
##	ENSG00000173898	291.253613	1.294043e-31	1.177511e-28	-
##	ENSG00000071539	119.084204	8.122742e-19	1.433001e-17	-
##	ENSG00000198901	218.964392	4.155136e-27	4.489884e-25	-
##	ENSG00000162383	37.025381	2.074570e-08	6.537959e-08	-
##	ENSG00000131187	138.313140	1.126470e-20	2.790191e-19	-
##	ENSG00000162078	55.373697	3.286962e-11	1.514210e-10	-
##	ENSG00000105889	104.187791	2.921805e-17	3.781070e-16	-
##	ENSG00000167900	184.080402	1.493440e-24	8.713548e-23	-
##	ENSG00000084110	71.908506	1.875791e-13	1.213264e-12	-
##	ENSG00000165973	19.567367	2.441500e-05	5.213821e-05	-
##	ENSG00000137804	240.511394	1.501020e-28	2.621326e-26	-
##	ENSG00000147536	184.067610	1.496862e-24	8.713548e-23	-
##	ENSG00000137807	189.038441	6.199850e-25	4.014577e-23	-
##	ENSG00000061656	292.656206	1.078961e-31	1.097304e-28	-
##	ENSG00000263513	121.068470	5.134917e-19	9.404404e-18	-
##	ENSG00000100604	14.711576	2.175090e-04	4.065419e-04	-
##	ENSG00000178752	66.011981	1.113883e-12	6.421447e-12	-
##	ENSG00000166415	46.586536	6.483187e-10	2.513743e-09	-
##	ENSG00000164220	41.208416	4.417088e-09	1.518533e-08	-
##	ENSG00000101842	24.435996	3.035888e-06	7.269733e-06	-

##	ENSG00000188385	65.213400	1.424869e-12	8.026900e-12	-
##	ENSG00000106089	256.541228	1.450544e-29	3.688007e-27	-
##	ENSG00000137809	105.891008	1.914482e-17	2.573833e-16	-
##	ENSG00000160180	41.806492	3.554845e-09	1.235620e-08	-
##	ENSG00000101049	86.571277	2.890163e-15	2.510957e-14	-
##	ENSG00000137673	46.434319	6.838002e-10	2.640067e-09	-
##	ENSG00000233822	94.198252	3.755264e-16	3.859974e-15	-
##	ENSG00000092758	63.855619	2.171769e-12	1.189725e-11	-
##	ENSG00000105664	50.312028	1.791153e-10	7.519972e-10	-
##	ENSG00000164647	123.490561	2.950140e-19	5.724464e-18	-
##	ENSG00000108602	22.437138	7.059934e-06	1.614967e-05	-
##	ENSG00000060709	25.308669	2.110639e-06	5.155529e-06	-
##	ENSG00000124882	26.308294	1.396758e-06	3.488162e-06	-
##	ENSG00000125319	228.885464	8.766006e-28	1.284368e-25	-
##	ENSG00000107984	36.702130	2.342896e-08	7.334118e-08	-
##	ENSG00000122861	107.938987	1.156928e-17	1.622232e-16	-
##	ENSG00000170577	53.817917	5.500932e-11	2.460144e-10	-
##	ENSG00000066230	62.880743	2.945757e-12	1.591407e-11	-
##	ENSG00000001084	97.151527	1.741361e-16	1.917604e-15	-
##	ENSG00000105825	43.524342	1.915331e-09	6.933452e-09	-
##	ENSG00000176945	99.505401	9.516470e-17	1.102750e-15	-
##	ENSG00000186847	22.899093	5.800618e-06	1.343788e-05	-
##	ENSG00000166922	74.296656	9.279656e-14	6.311407e-13	-
##	ENSG00000092853	152.869884	5.530800e-22	1.804189e-20	-
##	ENSG00000100473	128.068731	1.051916e-19	2.228747e-18	-
##	ENSG00000156096	24.652633	2.773165e-06	6.667397e-06	-
##	ENSG00000134258	38.098767	1.388267e-08	4.481104e-08	-
##	ENSG00000152377	72.748149	1.462951e-13	9.639085e-13	-
##	ENSG00000171320	174.285756	8.881426e-24	4.362244e-22	-
##	ENSG00000198734	57.528629	1.624891e-11	7.834004e-11	-
##	ENSG00000116711	95.400379	2.742658e-16	2.880791e-15	-
##	ENSG00000105048	51.979352	1.018058e-10	4.397003e-10	-
##	ENSG00000188910	63.556150	2.384481e-12	1.302125e-11	-
##	ENSG00000007350	17.852465	5.215697e-05	1.062248e-04	-
##	ENSG00000138778	178.766132	3.898647e-24	2.061276e-22	-
##	ENSG00000134057	283.818331	3.429388e-31	2.056534e-28	-
##	ENSG00000186806	58.380775	1.233169e-11	6.070687e-11	-
##	ENSG00000101076	29.351778	4.064363e-07	1.078569e-06	-
##	ENSG00000165449	62.973947	2.860916e-12	1.548118e-11	-
##	ENSG00000165891	118.662072	8.960001e-19	1.563259e-17	-
##	ENSG00000186340	133.153915	3.427676e-20	7.912027e-19	-
##	ENSG00000189057	173.932486	9.482546e-24	4.605161e-22	-
##	ENSG00000163975	109.069889	8.778976e-18	1.259583e-16	-
##	ENSG00000062038	91.203009	8.287476e-16	7.986744e-15	-
##	ENSG00000132749	88.296792	1.808170e-15	1.627353e-14	-
##	ENSG00000108821	96.061984	2.309013e-16	2.481077e-15	-
##	ENSG00000138160	245.206739	7.486073e-29	1.455024e-26	-
##	ENSG00000281406	99.711764	9.028586e-17	1.047619e-15	-
##	ENSG00000137812	198.299385	1.248747e-25	9.510835e-24	-
##	ENSG00000163808	206.770624	3.010274e-26	2.696613e-24	-
##	ENSG00000100095	25.858587	1.681043e-06	4.160256e-06	-
##	ENSG00000166546	103.309671	3.638429e-17	4.608410e-16	-
##	ENSG00000174501	56.941826	1.966579e-11	9.379361e-11	-
##	ENSG00000158373	172.276784	1.290386e-23	6.029591e-22	-

##	ENSG00000170442	74.393529	9.020357e-14	6.161713e-13	-
##	ENSG00000182489	90.064583	1.123358e-15	1.053240e-14	-
##	ENSG00000103257	121.047904	5.159272e-19	9.439012e-18	-
##	ENSG00000171631	169.956797	1.993302e-23	8.746751e-22	-
##	ENSG00000136492	224.207107	1.815067e-27	2.307404e-25	-
##	ENSG00000110492	241.145782	1.365597e-28	2.409164e-26	-
##	ENSG00000141527	147.451349	1.663263e-21	4.932444e-20	-
##	ENSG00000163568	97.853056	1.453287e-16	1.622071e-15	-
##	ENSG00000144354	129.763211	7.219500e-20	1.572014e-18	-
##	ENSG00000129521	128.903019	8.736581e-20	1.876357e-18	-
##	ENSG00000179546	55.195651	3.485546e-11	1.598451e-10	-
##	ENSG00000103269	192.782161	3.224107e-25	2.238618e-23	-
##	ENSG00000237289	78.087701	3.097325e-14	2.295313e-13	-
##	ENSG00000085840	179.147791	3.636816e-24	1.940645e-22	-
##	ENSG00000188488	49.744300	2.174332e-10	9.014875e-10	-
##	ENSG00000128422	49.823220	2.116422e-10	8.789532e-10	-
##	ENSG00000110427	53.692311	5.735804e-11	2.561775e-10	-
##	ENSG00000127561	95.387321	2.752007e-16	2.888856e-15	-
##	ENSG00000178401	102.461817	4.500783e-17	5.566097e-16	-
##	ENSG00000274290	128.445887	9.671409e-20	2.064308e-18	-
##	ENSG00000187583	201.785679	6.919782e-26	5.643213e-24	-
##	ENSG00000148344	167.656517	3.079186e-23	1.301615e-21	-
##	ENSG00000166473	68.446272	5.297773e-13	3.201440e-12	-
##	ENSG00000176920	152.334046	6.160470e-22	1.983396e-20	-
##	ENSG00000100526	173.375606	1.051562e-23	5.008390e-22	-
##	ENSG00000115616	48.205864	3.691129e-10	1.482359e-09	-
##	ENSG00000143590	248.306536	4.753746e-29	9.902111e-27	-
##	ENSG00000223572	82.240935	9.563596e-15	7.584634e-14	-
##	ENSG00000196208	90.215816	1.078758e-15	1.015831e-14	-
##	ENSG00000101311	248.016641	4.959129e-29	1.008687e-26	-
##	ENSG00000112984	261.813006	6.882180e-30	2.194295e-27	-
##	ENSG00000178773	127.589516	1.170671e-19	2.453300e-18	-
##	ENSG00000166803	196.845074	1.600711e-25	1.192875e-23	-
##	ENSG00000091651	249.623875	3.924229e-29	8.480749e-27	-
##	ENSG00000066248	75.050295	7.446666e-14	5.153939e-13	-
##	ENSG00000175497	44.422875	1.390312e-09	5.129557e-09	-
##	ENSG00000251493	42.083132	3.216160e-09	1.124680e-08	-
##	ENSG00000101680	44.671749	1.272733e-09	4.727019e-09	-
##	ENSG00000163053	79.188449	2.262316e-14	1.708745e-13	-
##	ENSG00000142583	150.343172	9.214489e-22	2.834685e-20	-
##	ENSG00000166920	108.967032	9.001573e-18	1.286822e-16	-
##	ENSG00000198753	142.884111	4.287915e-21	1.147581e-19	-
##	ENSG00000134690	255.317200	1.727423e-29	4.266487e-27	-
##	ENSG00000153002	17.361020	6.499872e-05	1.302611e-04	-
##	ENSG00000121207	60.700503	5.864533e-12	3.032055e-11	-
##	ENSG00000143858	74.709395	8.225074e-14	5.649714e-13	-
##	ENSG00000085552	154.022601	4.389255e-22	1.470655e-20	-
##	ENSG00000124602	164.150090	6.018432e-23	2.468833e-21	-
##	ENSG00000162849	253.443720	2.259584e-29	5.351500e-27	-
##	ENSG00000181019	111.584607	4.777930e-18	7.244196e-17	-
##	ENSG00000105464	83.224794	7.268632e-15	5.861352e-14	-
##	ENSG00000184661	213.617480	9.807882e-27	9.473099e-25	-
##	ENSG00000148848	146.409999	2.060919e-21	5.938538e-20	-
##	ENSG00000164749	107.734850	1.216221e-17	1.691652e-16	-

##	ENSG00000080986	232.966803	4.684922e-28	7.430973e-26	-
##	ENSG00000164638	102.351453	4.627443e-17	5.698281e-16	-
##	ENSG00000141449	91.764722	7.137361e-16	6.959832e-15	-
##	ENSG00000170627	44.250225	1.478342e-09	5.440414e-09	-
##	ENSG00000111665	238.761444	1.950107e-28	3.273340e-26	-
##	ENSG00000146670	201.688407	7.034051e-26	5.682790e-24	-
##	ENSG00000008300	250.051652	3.687890e-29	8.174350e-27	-
##	ENSG00000160161	97.364149	1.648373e-16	1.824502e-15	-
##	ENSG00000104783	130.091038	6.714600e-20	1.471340e-18	-
##	ENSG00000171004	139.047126	9.634306e-21	2.393211e-19	-
##	ENSG00000158402	269.540904	2.352298e-30	9.457877e-28	-
##	ENSG00000154839	174.220068	8.990184e-24	4.403153e-22	-
##	ENSG00000157456	245.802539	6.858203e-29	1.362890e-26	-
##	ENSG00000049283	143.566042	3.718319e-21	1.015577e-19	-
##	ENSG00000129173	211.625673	1.355657e-26	1.266916e-24	-
##	ENSG00000196754	64.088928	2.019536e-12	1.110905e-11	-
##	ENSG00000117983	35.050591	4.382913e-08	1.325454e-07	-
##	ENSG00000029993	271.077140	1.905339e-30	8.446514e-28	-
##	ENSG00000114631	220.749572	3.129300e-27	3.618571e-25	-
##	ENSG00000165480	216.079675	6.592237e-27	6.824742e-25	-
##	ENSG00000121152	205.257791	3.869765e-26	3.345218e-24	-
##	ENSG00000169607	206.656587	3.067677e-26	2.719849e-24	-
##	ENSG00000188761	148.076794	1.462962e-21	4.391172e-20	-
##	ENSG00000114270	106.074947	1.829428e-17	2.467159e-16	-
##	ENSG00000160886	62.985886	2.850231e-12	1.542819e-11	-
##	ENSG00000132746	96.004751	2.343593e-16	2.513547e-15	-
##	ENSG00000129810	221.134482	2.944332e-27	3.439497e-25	-
##	ENSG00000094755	41.954176	3.369738e-09	1.174585e-08	-
##	ENSG00000077152	326.976673	1.529149e-33	2.937494e-30	-
##	ENSG00000166851	256.891550	1.379956e-29	3.614856e-27	-
##	ENSG00000125851	21.741689	9.505562e-06	2.134030e-05	-
##	ENSG00000148773	215.026335	7.810559e-27	7.850974e-25	-
##	ENSG00000137571	145.182524	2.656499e-21	7.465880e-20	-
##	ENSG00000171848	200.610260	8.437228e-26	6.691341e-24	-
##	ENSG00000186871	276.966096	8.562869e-31	4.318884e-28	-
##	ENSG00000183317	171.008947	1.635778e-23	7.461996e-22	-
##	ENSG00000142273	232.859283	4.762420e-28	7.485225e-26	-
##	ENSG00000278828	100.463849	7.456279e-17	8.817484e-16	-
##	ENSG00000196584	261.711964	6.980520e-30	2.194295e-27	-
##	ENSG00000124664	110.201882	6.669893e-18	9.881386e-17	-
##	ENSG00000075218	223.061855	2.172534e-27	2.682924e-25	-
##	ENSG00000171246	58.324671	1.255711e-11	6.174624e-11	-
##	ENSG00000006611	41.576875	3.863500e-09	1.337526e-08	-
##	ENSG00000047457	138.110314	1.176304e-20	2.901158e-19	-
##	ENSG00000170835	49.706824	2.202395e-10	9.126849e-10	-
##	ENSG00000133055	48.926774	2.878398e-10	1.173242e-09	-
##	ENSG00000011347	174.091702	9.206652e-24	4.483769e-22	-
##	ENSG00000058404	48.133069	3.785263e-10	1.517001e-09	-
##	ENSG00000178999	228.722814	8.989083e-28	1.305985e-25	-
##	ENSG00000151012	107.508320	1.285656e-17	1.783926e-16	-
##	ENSG00000117724	279.190616	6.350666e-31	3.431146e-28	-
##	ENSG00000198125	65.533965	1.290582e-12	7.334932e-12	-
##	ENSG00000276043	257.097761	1.340053e-29	3.564335e-27	-
##	ENSG00000112742	223.359554	2.073219e-27	2.578697e-25	-

##	ENSG00000051341	208.215631	2.370936e-26	2.157427e-24	-
##	ENSG00000128298	113.882130	2.758085e-18	4.394888e-17	-
##	ENSG00000128165	219.519322	3.803939e-27	4.188936e-25	-
##	ENSG00000164932	168.165327	2.795894e-23	1.196490e-21	-
##	ENSG00000111344	171.509763	1.489287e-23	6.866207e-22	-
##	ENSG00000104112	40.797681	5.130434e-09	1.749853e-08	-
##	ENSG00000088992	89.569376	1.283008e-15	1.189380e-14	-
##	ENSG00000198732	71.821152	1.925070e-13	1.240959e-12	-
##	ENSG00000171903	42.300940	2.972796e-09	1.045072e-08	-
##	ENSG00000183010	387.411336	1.836836e-36	1.482299e-32	-
##	ENSG00000162062	367.776723	1.483058e-35	5.128116e-32	-
##	ENSG00000135069	225.741456	1.427988e-27	1.870340e-25	-
##	ENSG00000177398	61.037034	5.269923e-12	2.745983e-11	-
##	ENSG00000174469	52.863428	7.564965e-11	3.323891e-10	-
##	ENSG00000169347	18.590070	3.756546e-05	7.796750e-05	-
##	ENSG00000204544	59.770932	7.888651e-12	3.992590e-11	-
##	ENSG00000165304	228.510976	9.288330e-28	1.338216e-25	-
##	ENSG00000162782	76.723482	4.584296e-14	3.284620e-13	-
##	ENSG00000065618	64.868739	1.585226e-12	8.863833e-12	-
##	ENSG00000133316	76.799173	4.485281e-14	3.219013e-13	-
##	ENSG00000171747	40.571454	5.572516e-09	1.893166e-08	-
##	ENSG00000136231	129.953145	6.922436e-20	1.513047e-18	-
##	ENSG00000143228	290.788158	1.374702e-31	1.188361e-28	-
##	ENSG00000169507	56.283881	2.437975e-11	1.144762e-10	-
##	ENSG00000138271	58.919285	1.036709e-11	5.150477e-11	-
##	ENSG00000142945	263.208458	5.659839e-30	2.010382e-27	-
##	ENSG00000092607	97.478931	1.600296e-16	1.776976e-15	-
##	ENSG00000124466	118.872184	8.532796e-19	1.493153e-17	-
##	ENSG00000117399	260.222362	8.608493e-30	2.611092e-27	-
##	ENSG00000161958	257.257344	1.309982e-29	3.564335e-27	-
##	ENSG00000126787	266.266694	3.696812e-30	1.359876e-27	-
##	ENSG00000089685	222.830062	2.253212e-27	2.743365e-25	-
##	ENSG00000175832	276.811478	8.743186e-31	4.318884e-28	-
##	ENSG00000156970	256.037249	1.558608e-29	3.905329e-27	-
##	ENSG00000124143	99.258241	1.013636e-16	1.166762e-15	-
##	ENSG00000115507	129.042682	8.469759e-20	1.821314e-18	-
##	ENSG00000134873	98.066041	1.375825e-16	1.544587e-15	-
##	ENSG00000117650	244.421673	8.403950e-29	1.614399e-26	-
##	ENSG00000066279	257.547524	1.257053e-29	3.562817e-27	-
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##	ENSG00000186193	283.909988	3.388045e-31	2.056534e-28	-
##	ENSG00000147889	124.116056	2.559244e-19	5.005292e-18	-
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##	ENSG00000106536	52.447103	8.698453e-11	3.792870e-10	-
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##	ENSG00000024526	219.809054	3.632758e-27	4.052048e-25	-
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##	ENSG00000198535	116.000579	1.670525e-18	2.777087e-17	-
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##	ENSG00000158125	155.585398	3.213697e-22	1.106805e-20	-
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##	ENSG00000007306	89.922452	1.166989e-15	1.088833e-14	-
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##	ENSG00000241635	57.680414	1.546807e-11	7.482580e-11	-
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##	ENSG00000143512	121.649849	4.492817e-19	8.370292e-18	-
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##	ENSG00000104760	100.393682	7.590347e-17	8.957645e-16	-
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##	ENSG00000131668	98.798925	1.139999e-16	1.303535e-15	-
##	ENSG00000167755	73.039544	1.342424e-13	8.895807e-13	-
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## ENSG00000178363 67.521765 7.016193e-13 4.169920e-12 -
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```

## Task 9

Use STRING database to find PPI interactions among differentially expressed genes and export the network in TSV format.

## Task 10

Import the network in R and using igraph package and identify and plot the largest connected component.