

Transcription vs Metilation

Lucas Michel Todó

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1 Importar llistes i diccionari

- trans_df: Diferències de transcripció.
- df.10G: Llista de gens metilats diferencialment a 10G.
- df.1.2B: Llista de gens metilats diferencialment a 1.2B.
- rosetta: Diccionari amb nomenclatura antiga i nova dels gens.

2 Calcular FC

Un cop importades trans_df calculem el FC que correspon al les diferències màximes de transcripció:

```
get_max_fc <- function(x){  
  l <- abs(as.numeric(x[1]) - as.numeric(x[2]))  
  m <- abs(as.numeric(x[3]) - as.numeric(x[4]))  
  r <- abs(as.numeric(x[5]) - as.numeric(x[6]))  
  s <- abs(as.numeric(x[7]) - as.numeric(x[8]))  
  top <- which.max(c(l,m,r,s))  
  if (length(top) > 0){  
    if (top == 1) {
```

```

    fc = as.numeric(x[1])/as.numeric(x[2])
  } else if (top == 2) {
    fc = as.numeric(x[3])/as.numeric(x[4])
  } else if (top == 3) {
    fc = as.numeric(x[5])/as.numeric(x[6])
  } else if (top == 4) {
    fc = as.numeric(x[7])/as.numeric(x[8])
  }
} else {
  fc = NA
}
return(fc)
}

trans_df["FC"] <- apply(trans_df[,-1], 1, get_max_fc)

```

3 Editar noms de gens

"Traduïm" els noms dels gens:

```

for (i in 1:length(trans_df[,1])){
  if (trans_df[i,1] %in% rosetta[,3]){
    trans_df[i,"ID"] <- rosetta[rosetta[,3] %in% trans_df[i,1],1][1]
  } else if (trans_df[i,1] %in% rosetta[,4]){
    trans_df[i,"ID"] <- rosetta[rosetta[,4] %in% trans_df[i,1],1][1]
  } else if (trans_df[i,1] %in% rosetta[,5]){
    trans_df[i,"ID"] <- rosetta[rosetta[,5] %in% trans_df[i,1],1][1]
  }
}
}

```

4 Plots

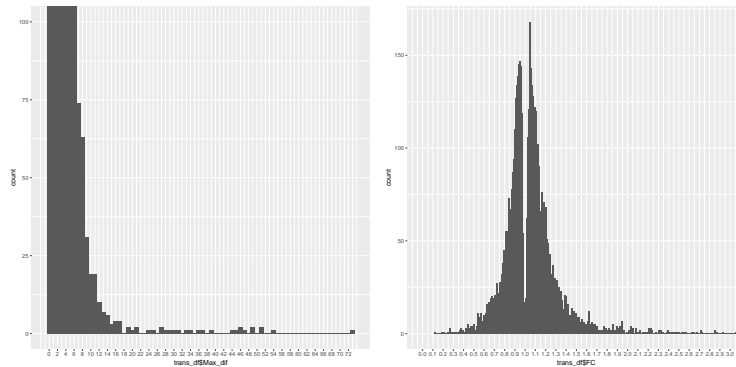
I fem alguns plots:

```

h <- ggplot(trans_df, aes(x = trans_df$Max_dif))
h + geom_histogram(binwidth = 1) +
  scale_x_continuous(breaks = seq(0, max(trans_df$Max_dif, na.rm = TRUE), 2)) +
  coord_cartesian(ylim = c(0,100))

fc <- ggplot(trans_df, aes(x = trans_df$FC))
fc + geom_histogram(binwidth = 0.01) +
  scale_x_continuous(breaks = seq(0, 3, by = 0.1)) +
  coord_cartesian(xlim = c(0,3))

```



5 Llistes

I comencem les comparacions:

```
trans_df_FC <- trans_df[!is.na(trans_df$FC),]

df_10G_tss <- df_10G[df_10G$X5.cov > 10,]
df_10G_ORF <- df_10G[df_10G$Gene.cov > 10,]
df_10G_tts <- df_10G[df_10G$X3.cov > 10,]
df_10G_filtered <- df_10G[df_10G$X5.cov > 10 | df_10G$Gene.cov > 10,]

table(df_10G_tts[!is.na(df_10G_tts$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1])

## < table of extent 0 >

df_10G_tts[df_10G_tts$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0100300;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0220800;description=cytoadherence linked asexual protein 2
## [3] ID=PF3D7_0402000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [4] ID=PF3D7_0402000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [5] ID=PF3D7_0421600;description=erythrocyte membrane protein 1 (PfEMP1)-like pseudogene
## [6] ID=PF3D7_0421700;description=conserved Plasmodium protein%2C unknown function
## [7] ID=PF3D7_0421700;description=conserved Plasmodium protein%2C unknown function
## [8] ID=PF3D7_0532600;description=Plasmodium exported protein%2C unknown function
## [9] ID=PF3D7_0532600;description=Plasmodium exported protein%2C unknown function
## [10] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [11] ID=PF3D7_0711900;description=rifin%2C pseudogene
## [12] ID=PF3D7_0732900;description=rifin
## [13] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [14] ID=PF3D7_1040500;description=rifin
## [15] ID=PF3D7_1040700;description=rifin
## [16] ID=PF3D7_1300400;description=rifin
```

```

## [17] ID=PF3D7_1300500;description=rifin
## [18] ID=PF3D7_1300600;description=rifin
## [19] ID=PF3D7_1301400;description=Plasmodium exported protein (hyp12)%2C unknown function
## [20] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [21] ID=PF3D7_1371900;description=Plasmodium exported protein%2C unknown function
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

df_10G_tts[df_10G_tts$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_0712000;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0937800;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_1040600;description=rifin
## [4] ID=PF3D7_1040600;description=rifin
## [5] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

table(df_10G_tss[!is.na(df_10G_tss$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1])

## < table of extent 0 >

df_10G_tss[df_10G_tss$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0220800;description=cytoadherence linked asexual protein 2
## [2] ID=PF3D7_0302500;description=cytoadherence linked asexual protein 3.1
## [3] ID=PF3D7_0324800;description=rifin
## [4] ID=PF3D7_0532600;description=Plasmodium exported protein%2C unknown function
## [5] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [6] ID=PF3D7_0711900;description=rifin%2C pseudogene
## [7] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [8] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [9] ID=PF3D7_1040500;description=rifin
## [10] ID=PF3D7_1040700;description=rifin
## [11] ID=PF3D7_1300500;description=rifin
## [12] ID=PF3D7_1301300;description=Plasmodium exported protein (PHISTa-like)%2C unknown function
## [13] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [14] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [15] ID=PF3D7_1372000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

df_10G_tss[df_10G_tss$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_1040600;description=rifin
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

table(df_10G_ORF[!is.na(df_10G_ORF$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1])

## < table of extent 0 >

```

```
df_10G_ORF[df_10G_ORF$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]
```

```
## [1] ID=PF3D7_0100200;description=rifin
## [2] ID=PF3D7_0100300;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0100400;description=rifin
## [4] ID=PF3D7_0220800;description=cytoadherence linked asexual protein 2
## [5] ID=PF3D7_0302500;description=cytoadherence linked asexual protein 3.1
## [6] ID=PF3D7_0302500;description=cytoadherence linked asexual protein 3.1
## [7] ID=PF3D7_0324800;description=rifin
## [8] ID=PF3D7_0402000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [9] ID=PF3D7_0421600;description=erythrocyte membrane protein 1 (PfEMP1)-like pseudogene
## [10] ID=PF3D7_0421700;description=conserved Plasmodium protein%2C unknown function
## [11] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [12] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [13] ID=PF3D7_0732900;description=rifin
## [14] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [15] ID=PF3D7_0808900;description=rifin
## [16] ID=PF3D7_1040500;description=rifin
## [17] ID=PF3D7_1040700;description=rifin
## [18] ID=PF3D7_1240600;description=erythrocyte membrane protein 1%2C PfEMP1
## [19] ID=PF3D7_1240600;description=erythrocyte membrane protein 1%2C PfEMP1
## [20] ID=PF3D7_1300200;description=rifin
## [21] ID=PF3D7_1300400;description=rifin
## [22] ID=PF3D7_1300500;description=rifin
## [23] ID=PF3D7_1300600;description=rifin
## [24] ID=PF3D7_1301300;description=Plasmodium exported protein (PHISTa-like)%2C unknown function
## [25] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [26] ID=PF3D7_1371900;description=Plasmodium exported protein%2C unknown function
## [27] ID=PF3D7_1372000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## 51 Levels: ID=PF3D7_0100200;description=rifin ...
```

```
df_10G_ORF[df_10G_ORF$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]
```

```
## [1] ID=PF3D7_0712000;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0712000;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0733000;description=erythrocyte membrane protein 1%2C PfEMP1
## [4] ID=PF3D7_0733000;description=erythrocyte membrane protein 1%2C PfEMP1
## [5] ID=PF3D7_0808800;description=rifin
## [6] ID=PF3D7_0937800;description=erythrocyte membrane protein 1%2C PfEMP1
## [7] ID=PF3D7_0937800;description=erythrocyte membrane protein 1%2C PfEMP1
## [8] ID=PF3D7_1040600;description=rifin
## [9] ID=PF3D7_1041300;description=erythrocyte membrane protein 1%2C PfEMP1
## [10] ID=PF3D7_1041300;description=erythrocyte membrane protein 1%2C PfEMP1
## [11] ID=PF3D7_1300300;description=erythrocyte membrane protein 1%2C PfEMP1
## [12] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [13] ID=PF3D7_1373500;description=erythrocyte membrane protein 1%2C PfEMP1
```

```

## 51 Levels: ID=PF3D7_0100200;description=rifin ...

table(df_10G_filtered[!is.na(df_10G_filtered$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations")

## < table of extent 0 >

df_10G_filtered[df_10G_filtered$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0100200;description=rifin
## [2] ID=PF3D7_0100300;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0100400;description=rifin
## [4] ID=PF3D7_0220800;description=cytoadherence linked asexual protein 2
## [5] ID=PF3D7_0302500;description=cytoadherence linked asexual protein 3.1
## [6] ID=PF3D7_0302500;description=cytoadherence linked asexual protein 3.1
## [7] ID=PF3D7_0324800;description=rifin
## [8] ID=PF3D7_0402000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [9] ID=PF3D7_0421600;description=erythrocyte membrane protein 1 (PfEMP1)-like pseudogene
## [10] ID=PF3D7_0421700;description=conserved Plasmodium protein%2C unknown function
## [11] ID=PF3D7_0532600;description=Plasmodium exported protein%2C unknown function
## [12] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [13] ID=PF3D7_0711700;description=erythrocyte membrane protein 1%2C PfEMP1
## [14] ID=PF3D7_0711900;description=rifin%2C pseudogene
## [15] ID=PF3D7_0732900;description=rifin
## [16] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [17] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [18] ID=PF3D7_0800800;description=Plasmodium exported protein (hyp7)%2C unknown function
## [19] ID=PF3D7_0808900;description=rifin
## [20] ID=PF3D7_1040500;description=rifin
## [21] ID=PF3D7_1040500;description=rifin
## [22] ID=PF3D7_1040700;description=rifin
## [23] ID=PF3D7_1240600;description=erythrocyte membrane protein 1%2C PfEMP1
## [24] ID=PF3D7_1240600;description=erythrocyte membrane protein 1%2C PfEMP1
## [25] ID=PF3D7_1300200;description=rifin
## [26] ID=PF3D7_1300400;description=rifin
## [27] ID=PF3D7_1300500;description=rifin
## [28] ID=PF3D7_1300500;description=rifin
## [29] ID=PF3D7_1300600;description=rifin
## [30] ID=PF3D7_1301300;description=Plasmodium exported protein (PHISTa-like)%2C unknown function
## [31] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [32] ID=PF3D7_1301500;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [33] ID=PF3D7_1371900;description=Plasmodium exported protein%2C unknown function
## [34] ID=PF3D7_1372000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## [35] ID=PF3D7_1372000;description=Plasmodium exported protein (PHISTa)%2C unknown function
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

df_10G_filtered[df_10G_filtered$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

```

```

## [1] ID=PF3D7_0712000;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0712000;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0733000;description=erythrocyte membrane protein 1%2C PfEMP1
## [4] ID=PF3D7_0733000;description=erythrocyte membrane protein 1%2C PfEMP1
## [5] ID=PF3D7_0808800;description=rifin
## [6] ID=PF3D7_0937800;description=erythrocyte membrane protein 1%2C PfEMP1
## [7] ID=PF3D7_0937800;description=erythrocyte membrane protein 1%2C PfEMP1
## [8] ID=PF3D7_1040600;description=rifin
## [9] ID=PF3D7_1040600;description=rifin
## [10] ID=PF3D7_1041300;description=erythrocyte membrane protein 1%2C PfEMP1
## [11] ID=PF3D7_1041300;description=erythrocyte membrane protein 1%2C PfEMP1
## [12] ID=PF3D7_1300300;description=erythrocyte membrane protein 1%2C PfEMP1
## [13] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [14] ID=PF3D7_1373500;description=erythrocyte membrane protein 1%2C PfEMP1
## 51 Levels: ID=PF3D7_0100200;description=rifin ...

df_1.2B_tss <- df_1.2B[df_1.2B$X5.cov > 10,]
df_1.2B_ORF <- df_1.2B[df_1.2B$Gene.cov > 10,]
df_1.2B_tts <- df_1.2B[df_1.2B$X3.cov > 10,]
df_1.2B_filtered <- df_1.2B[df_1.2B$X5.cov > 10 | df_1.2B$Gene.cov > 10,]

table(df_1.2B_tss[!is.na(df_1.2B_tss$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1])

## < table of extent 0 >

df_1.2B_tss[df_1.2B_tss$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_0302200;description=cytoadherence linked asexual protein 3.2
## [2] ID=PF3D7_0421100;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0421100;description=erythrocyte membrane protein 1%2C PfEMP1
## [4] ID=PF3D7_0425900;description=rifin
## [5] ID=PF3D7_1100500;description=rifin
## [6] ID=PF3D7_1139100;description=RNA-binding protein%2C putative
## [7] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [8] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [9] ID=PF3D7_1301700;description=Plasmodium exported protein (hyp8)%2C unknown function
## [10] ID=PF3D7_1301700;description=Plasmodium exported protein (hyp8)%2C unknown function
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

df_1.2B_tss[df_1.2B_tss$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0223400;description=rifin
## [2] ID=PF3D7_0421200;description=rifin
## [3] ID=PF3D7_1100100;description=erythrocyte membrane protein 1%2C PfEMP1
## [4] ID=PF3D7_1100100;description=erythrocyte membrane protein 1%2C PfEMP1
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

```

```

table(df_1.2B_tts[!is.na(df_1.2B_tts$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1])

## < table of extent 0 >

df_1.2B_tts[df_1.2B_tts$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_0223500;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0302100;description=serine/threonine protein kinase
## [3] ID=PF3D7_0302200;description=cytoadherence linked asexual protein 3.2
## [4] ID=PF3D7_0302200;description=cytoadherence linked asexual protein 3.2
## [5] ID=PF3D7_0421300;description=erythrocyte membrane protein 1%2C PfEMP1
## [6] ID=PF3D7_0731800;description=alpha/beta hydrolase%2C putative
## [7] ID=PF3D7_0731800;description=alpha/beta hydrolase%2C putative
## [8] ID=PF3D7_1100300;description=rifin
## [9] ID=PF3D7_1100300;description=rifin
## [10] ID=PF3D7_1240000;description=3-hydroxyisobutyryl-coenzyme A hydrolase%2C putative
## [11] ID=PF3D7_1240100;description=early transcribed membrane protein 12
## [12] ID=PF3D7_1301700;description=Plasmodium exported protein (hyp8)%2C unknown function
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

df_1.2B_tts[df_1.2B_tts$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0115600;description=rifin
## [2] ID=PF3D7_0223400;description=rifin
## [3] ID=PF3D7_0421200;description=rifin
## [4] ID=PF3D7_0421200;description=rifin
## [5] ID=PF3D7_1039000;description=serine/threonine protein kinase%2C FIKK family
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

table(df_1.2B_ORF[!is.na(df_1.2B_ORF$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1])

## < table of extent 0 >

df_1.2B_ORF[df_1.2B_ORF$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_0115700;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0302100;description=serine/threonine protein kinase
## [3] ID=PF3D7_0302200;description=cytoadherence linked asexual protein 3.2
## [4] ID=PF3D7_0302200;description=cytoadherence linked asexual protein 3.2
## [5] ID=PF3D7_0421100;description=erythrocyte membrane protein 1%2C PfEMP1
## [6] ID=PF3D7_0421300;description=erythrocyte membrane protein 1%2C PfEMP1
## [7] ID=PF3D7_0421300;description=erythrocyte membrane protein 1%2C PfEMP1
## [8] ID=PF3D7_0425900;description=rifin
## [9] ID=PF3D7_0731800;description=alpha/beta hydrolase%2C putative
## [10] ID=PF3D7_1100300;description=rifin
## [11] ID=PF3D7_1100500;description=rifin
## [12] ID=PF3D7_1139100;description=RNA-binding protein%2C putative

```



```

## [13] ID=PF3D7_1255200;description=erythrocyte membrane protein 1%2C PfEMP1
## [14] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [15] ID=PF3D7_1301700;description=Plasmodium exported protein (hyp8)%2C unknown function
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

df_1.2B_ORF[df_1.2B_ORF$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0115600;description=rifin
## [2] ID=PF3D7_0421200;description=rifin
## [3] ID=PF3D7_1039000;description=serine/threonine protein kinase%2C FIKK family
## [4] ID=PF3D7_1100100;description=erythrocyte membrane protein 1%2C PfEMP1
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

table(df_1.2B_filtered[!is.na(df_1.2B_filtered$FC),]$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations")

## < table of extent 0 >

df_1.2B_ORF[df_1.2B_filtered$Gene %in% trans_df_FC$ID[trans_df_FC$FC < 1], "Annotations"]

## [1] ID=PF3D7_0302100;description=serine/threonine protein kinase
## [2] ID=PF3D7_0421100;description=erythrocyte membrane protein 1%2C PfEMP1
## [3] ID=PF3D7_0421200;description=rifin
## [4] ID=PF3D7_0421300;description=erythrocyte membrane protein 1%2C PfEMP1
## [5] ID=PF3D7_0425800;description=erythrocyte membrane protein 1%2C PfEMP1
## [6] ID=PF3D7_0425800;description=erythrocyte membrane protein 1%2C PfEMP1
## [7] ID=PF3D7_0731800;description=alpha/beta hydrolase%2C putative
## [8] ID=PF3D7_0731900;description=rifin%2C pseudogene
## [9] ID=PF3D7_1100300;description=rifin
## [10] ID=PF3D7_1100400;description=rifin
## [11] ID=PF3D7_1139100;description=RNA-binding protein%2C putative
## [12] <NA>
## [13] <NA>
## [14] <NA>
## [15] <NA>
## [16] <NA>
## [17] <NA>
## [18] <NA>
## [19] <NA>
## [20] <NA>
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SURF

df_1.2B_ORF[df_1.2B_filtered$Gene %in% trans_df_FC$ID[trans_df_FC$FC > 1], "Annotations"]

## [1] ID=PF3D7_0115700;description=erythrocyte membrane protein 1%2C PfEMP1
## [2] ID=PF3D7_0401500;description=stevor%2C pseudogene
## [3] ID=PF3D7_0425900;description=rifin
## [4] ID=PF3D7_0500300;description=rifin%2C pseudogene

```

```
## [5] ID=PF3D7_1255100;description=rifin
## [6] ID=PF3D7_1301600;description=erythrocyte binding antigen-140
## [7] ID=PF3D7_1301700;description=Plasmodium exported protein (hyp8)%2C unknown function
## 42 Levels: ID=PF3D7_0115000;description=surface-associated interspersed protein 1.3 (SUR)
```

```
length(trans_df$ID[trans_df$FC > 1])
```

```
## [1] 2947
```

```
length(trans_df$ID[trans_df$FC < 1])
```

```
## [1] 2449
```

```
length(trans_df$ID)
```

```
## [1] 5267
```

```
2449+2947
```

```
## [1] 5396
```