Homework two report

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ABSTRACT

According to the result obtained from the following analysis, transcription activator B plays a more important role in cancer.

Results

Quality Control

To check if there exists any microarry chips that perform abnormally, I first briefly visualized the distribution of expression level for each chip in Relative Log Expression Level(REL) with the package *Oligo*.[1] It is revealed that the total expression level among these chips are approximately the same. Consequently, I can make sure that all microarry data are reliable and can be applied to subsequent analysis.
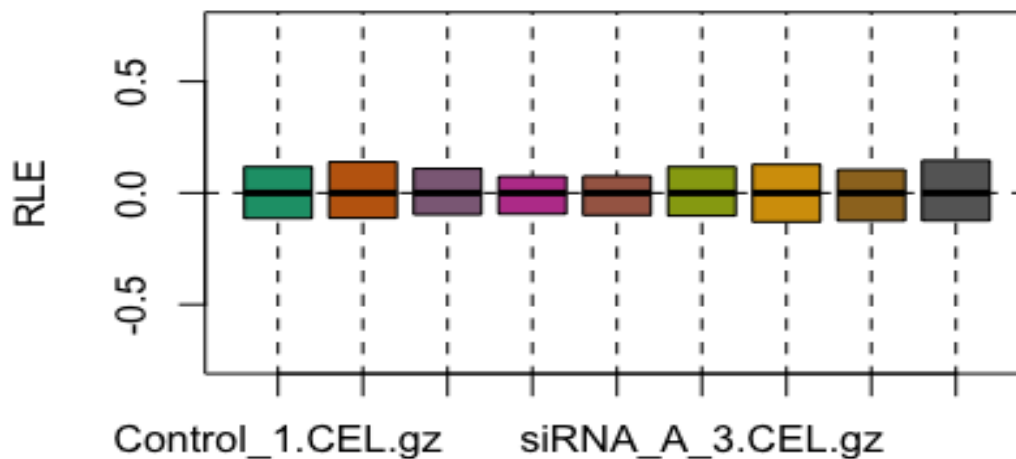

Figure 1. Relative Log Expression Level(REL) for each chip

Differential Expression Gene Analysis

Rawdata retrieved from chips are read in with the package *Affy*, and are pretreated using *rma* algorithm, which are proved to have a better performance in enhancing the signal from Perfect Match(PM) probes[2].

By respectively comparing the data retrieved from transcription-activator-A-knocked out(abbreviated as sample A below) and transcription-activator-B-knocked out(abbreviated as sample B below) samples with data from control samples, a Differential Expression Gene Analysis has been performed. Result shows that more genes are differentially expressed in samples treated with siRNA B, The threshold of differntial expression is determined by $abs(logFC) > 1.5$ and $adj.P.value < 0.05$ so as to remove as much false positive results as possible. The result are drawn as volcanoplots listed below. After figuring out the number of significantly expressed genes respectively in sample A and B, I found that sample B contains dramitically higher number of differential expressed genes.

group	sample A	sample B
number	7	264

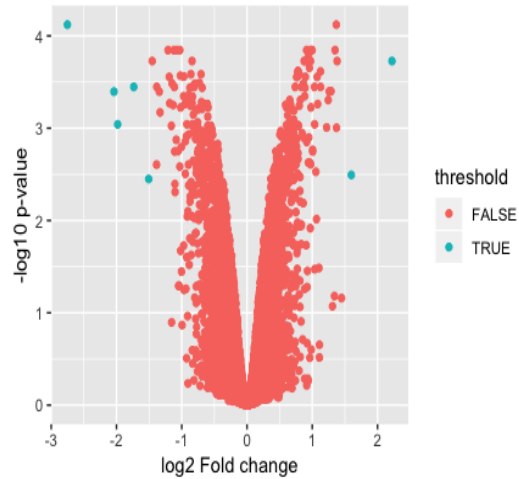**Table 1.** number of significantly expressed genes
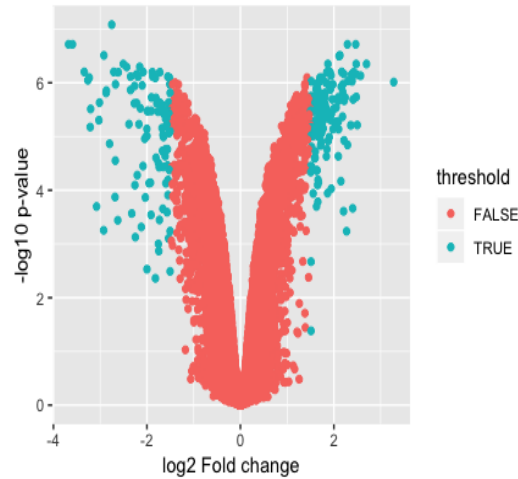

Figure 2. volcanoplot of sample A

Figure 3. volcanoplot of sample B

Probable Impact of Transcription Activator B on Cancer

After clustering the differential expressed genes obtained in the previous step by Genetic Oncology(GO) Analysis and Kegg Analysis, I found that the transcription activator B plays a role in cancer probably through interfering cell cycle

0.0.1 Genetic Oncology(GO) Analysis
0.0.2 Kegg Analysis
0.0.3 GSEA Analysis
A/B Gene Hypothesis

- First item

- Second item

References

1. https://blog.csdn.net/u014801157/article/details/66974577. Accessed March 27, 2017.

2. https://www.jianshu.com/p/db8b915a27e9. Accessed May 7, 2018.