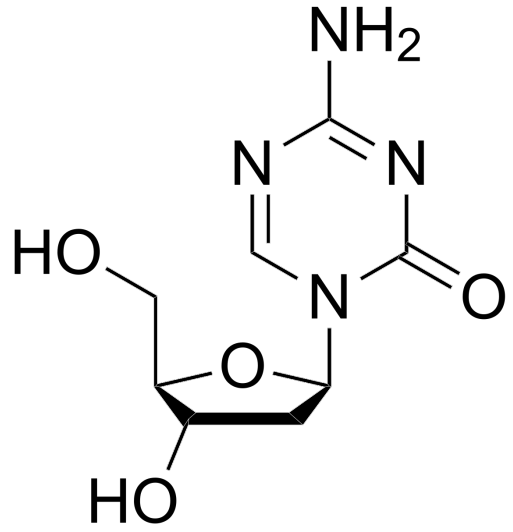
Example RNA-seq Differential Expression Presentation

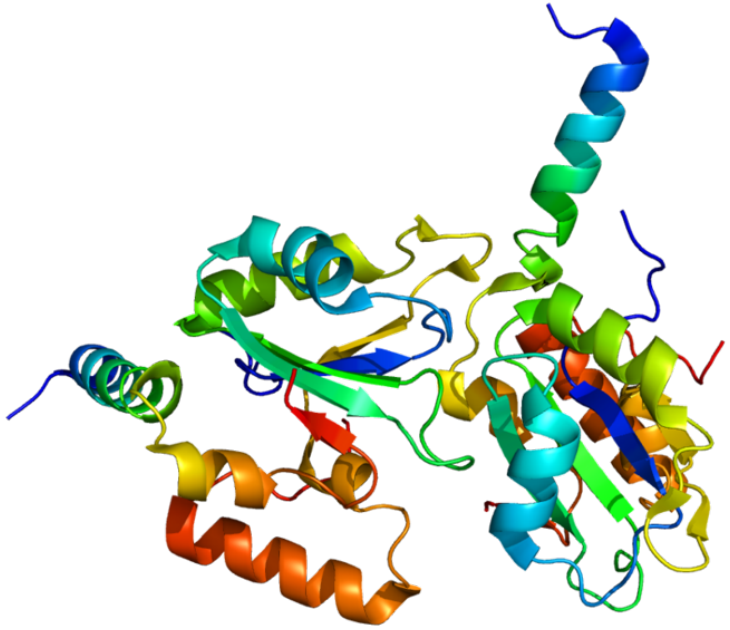
Background

- Interested in seeing the effects of DNA demethylation on RNA expression
- decitabine (DAC)
  - Cytidine analog
  - Inhibits DNA methyltransferases
  - Approved to treat myelodysplastic syndromes (MDS) and acute myeloid leukemia (AML)
- siSF3B1
  - splicing factor 3B subunit 1
  - Part of larger complexes responsible for alternative splicing of mRNA
- YB5 cells
  - Colon cancer cell line
  - GFP reporter knocked in which fluoresces when demethylated

decitabine

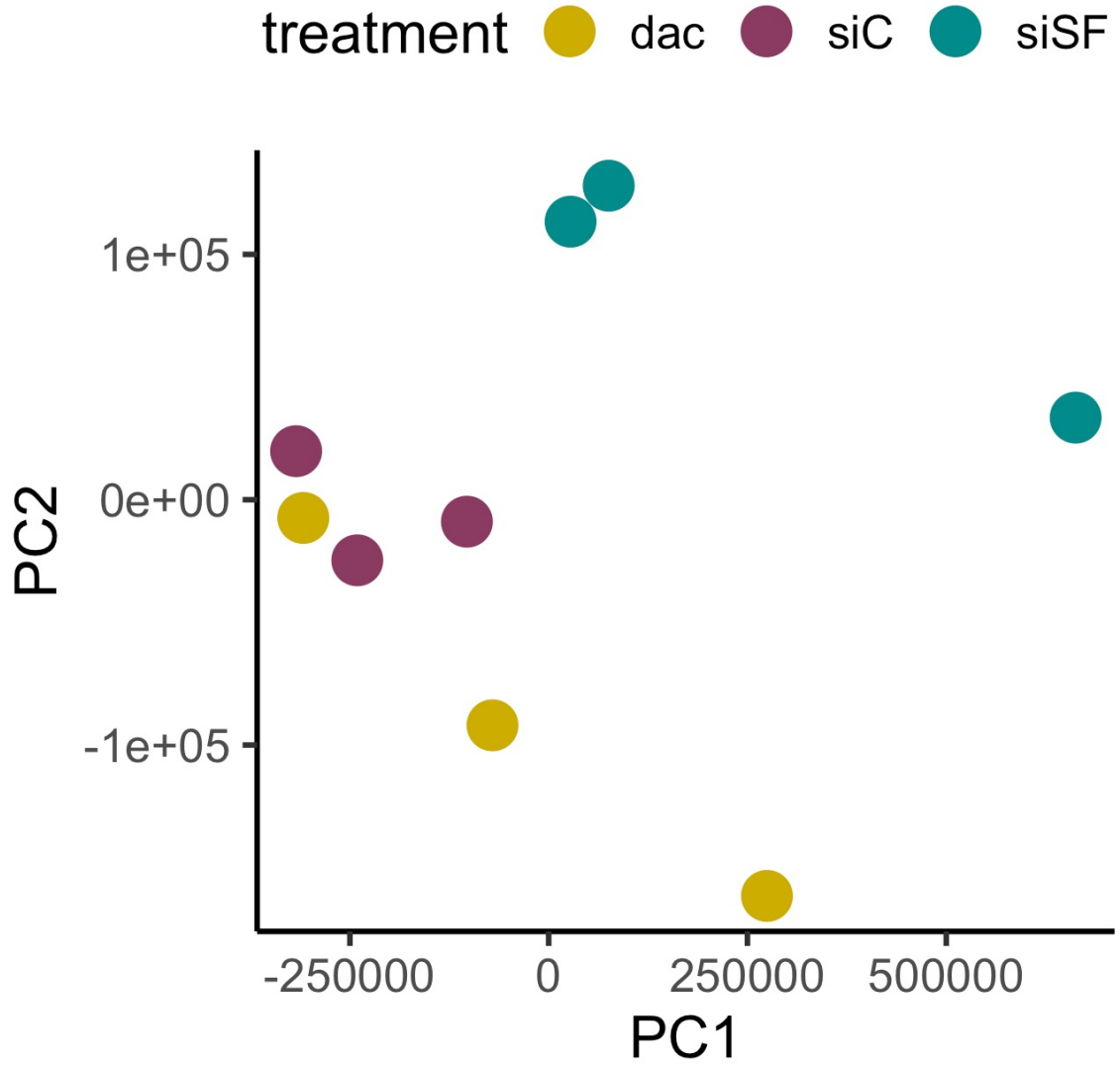


SF3B1

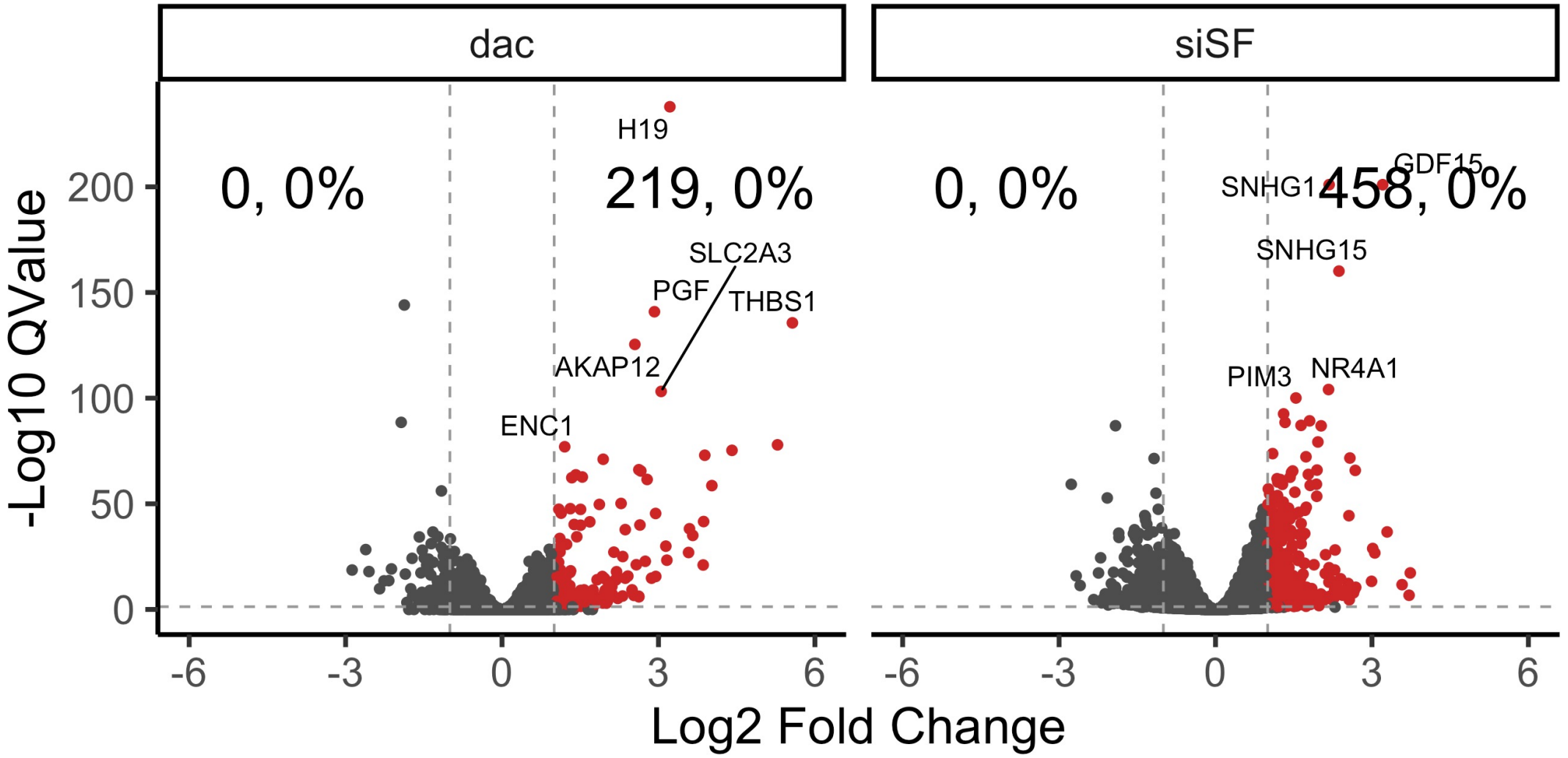


images: Wikipedia

Clustering

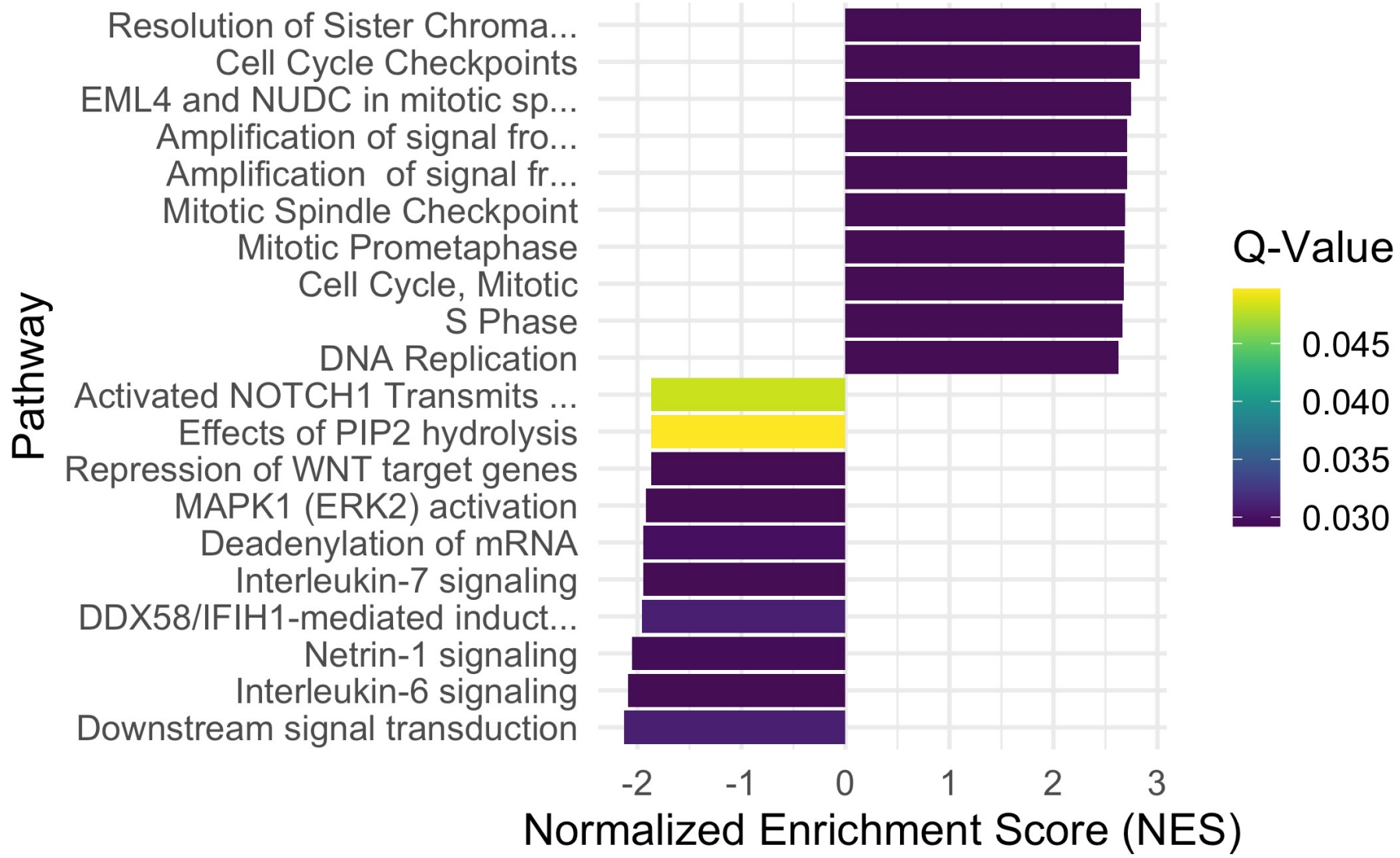

treatment
dac
siC
siSF
1e+05
0e+00
-1e+05
PC2
-250000
0
250000
500000
PC1

Differential Expression Results



Gene Set Enrichment Analysis

*** If you don't get any significant results, you don't have to do this part**



Conclusions

- DNA demethylation leads to large increases in gene expression because formerly silenced genes are no longer repressed and become expressed.
- While DAC and siSF3B1 show similar patterns of gene expression changes, they active distinct sets of genes from each other
- Global demethylation and activation of this gene expression program cause pathways related to cell cycle, indicating that this may possibly cause cell cycle arrest (although more research would be needed to confirm)