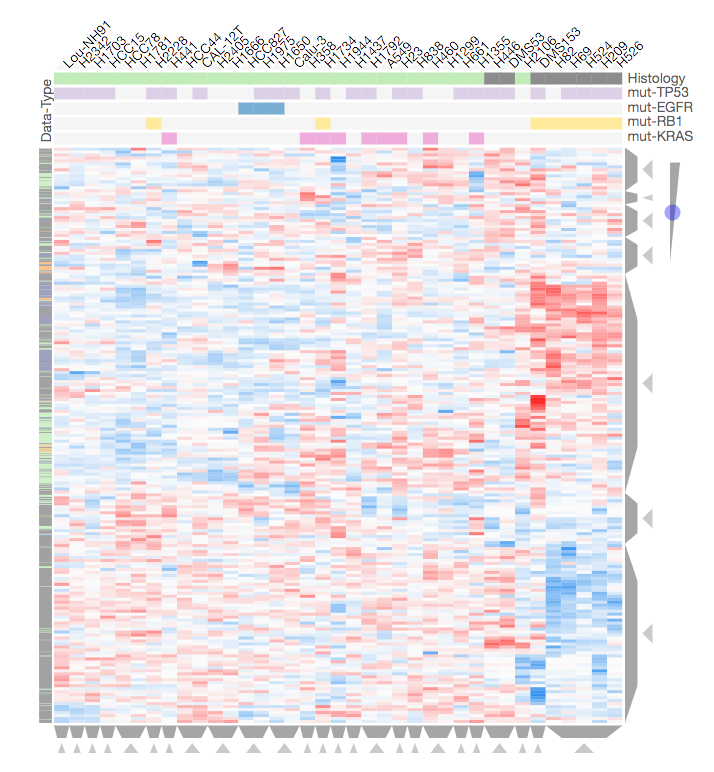
# CST PTM Data



This is a combination of all types of PTM data. I excluded PTMs that had too many missing values (details in processing notebook). I will focus on the two large clusters with high and low PTM values in SCLE and vice versa in NSCLC.

## GO Bio Process

### Up-regulated SCLC PTMs:

mRNA processing, gene expression, splicing, …

### Down-regulated SCLC PTMs:

neurotrophin TRK receptor signaling, mRNA processing response to peptide, … (PTMs were mostly phosphorylation)

# Gene Expression Data CCLE

# ../../../Desktop/Screen%20Shot%202017-04-10%20at%202.54.47%20PM.png

This includes the top ~1000 variably expressed genes across the lung cancer cell lines. I’ll focus on the three largest clusters.

## GO Biological Process

### Up-regulated SCLC Genes:

neuronal differentiation

Refs: Neuronal Characteristics of small-cell lung cancer [link](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2361510/). Markers of small cell lung cancer [link](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC441408/).

### Down-regulated SCLC Genes:

Wounding, cell migration, cell component movement, cell motility, adhesion, ECM, …

Ref: An adherent subline of a unique small-cell lung cancer cell line downregulates antigens of the neural cell adhesion molecule [link](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC329817/): “Small-cell lung cancer (SCLC) lines are distinguished from non-small-cell lung cancer (NSCLC) lines by their growth in gloating aggregates, in contrast to the adherent monolayers formed by NSCLC cells in culture,”.

### Mixed-regulated Genes (bottom cluster):

No strong enrichments, endopepsidase, single cell adhesion

## ChEA

### Up-regulated SCLC Genes:

SUZ12, BMI1

Refs: SUZ12 is involved in progression on NSCLC by promoting cell proliferation and metastasis [link](https://www.ncbi.nlm.nih.gov/pubmed/24633887). BMI1 expression modulates non-small cell lung cancer progression [link](https://www.ncbi.nlm.nih.gov/pubmed/25880371).

### Down-regulated SCLC Genes:

SOX2, CJUN, ERLA, SMAD2/3

Refs: The role of SOX2 in small cell lung cancer [link](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4367598/).

### Mixed-regulated Genes (bottom cluster):

SOX2 enrichment

# Merge PTM and Gene Expression Data (~2500 rows)

# ../../../Desktop/Screen%20Shot%202017-04-10%20at%203.17.37%20PM.png

## GO Biological Processes

### Down-regulated SCLC:

Cellular component movement, cell motility, cell migration, locomotion, response to wounding, response to virus/organism, cell adhesion, cell junction, coagulation

Ref: See above: An adherent subline…

### Up-regulated SCLC:

## ChEA

### Down-regulated SCLC:

SOX2, SMAD3, SMAD3, RELA, …

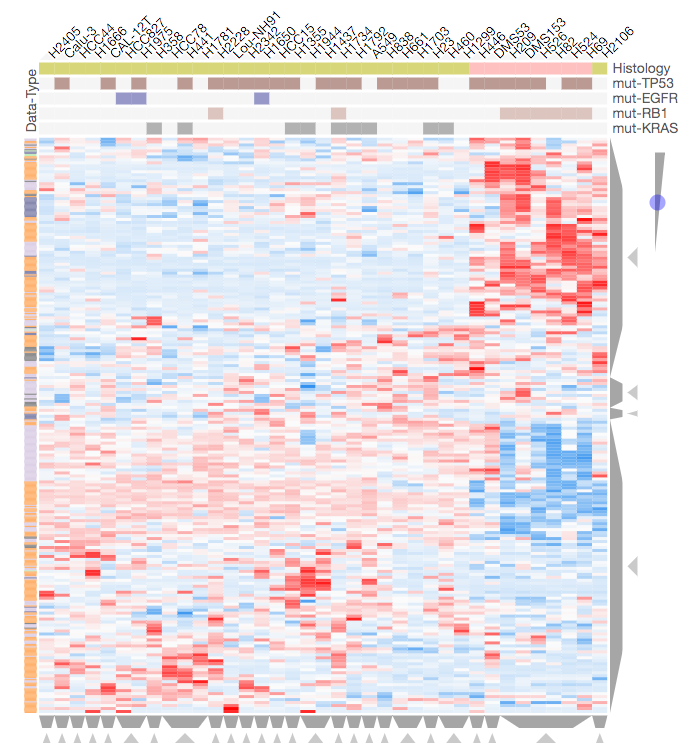
Ref: Comprehensive genomic analysis identifies SOX2 as a frequently amplified gene in small-cell lung cancer [link](http://www.nature.com/ng/journal/v44/n10/full/ng.2405.html)

### Up-regulated SCLC

Is there a relationship between GO enrichment cell motility and ChEA enrichment SOX2/SMAD2/etc.. ?

This reference seems to imply that loss of SOX2 leads to cell motility [link](https://www.ncbi.nlm.nih.gov/pubmed/26040981)

# Merge PTM and Gene Expression Data Filtered (~700 rows)



## GO Biological Processes

### Up-regulated SCLC:

### Down-regulated SCLC:

## ChEA

### Up-regulated SCLC:

### Down-regulated SCLC: