Módulo: Expresión diferencial

Bioinformática y Estadística 2

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21 al 24 de Febrero, 2023
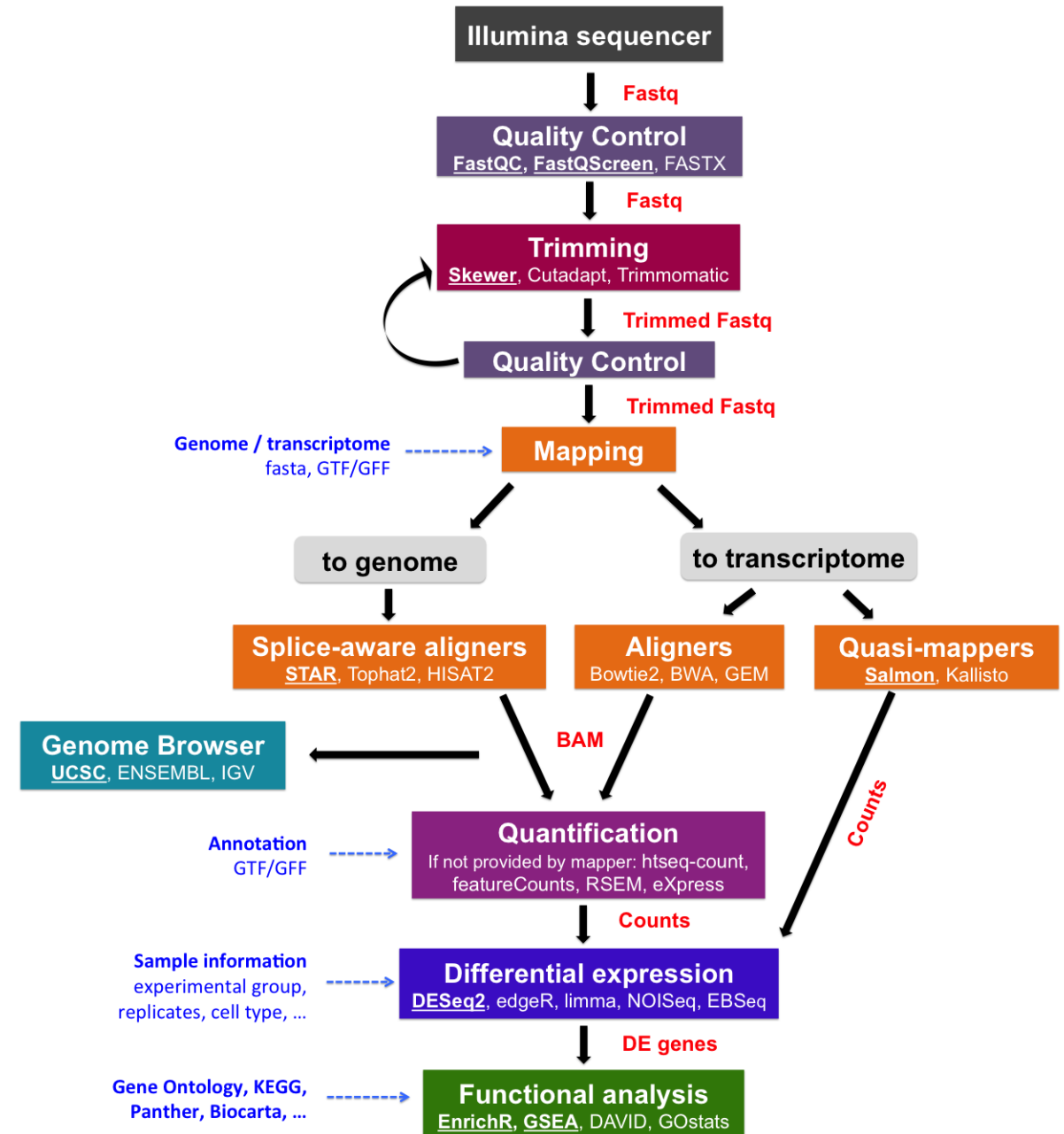
Día 2

- Gene Set Enrichment Analysis (GSEA) - Análisis funcional
- Información general
- Ejemplos de graficas

Pipeline bioinformática

Dónde estamos...

mRNA-Seq data analysis workflow "https://biocorecrg.github.io/RNAseq_course_2 019/workflow.html"
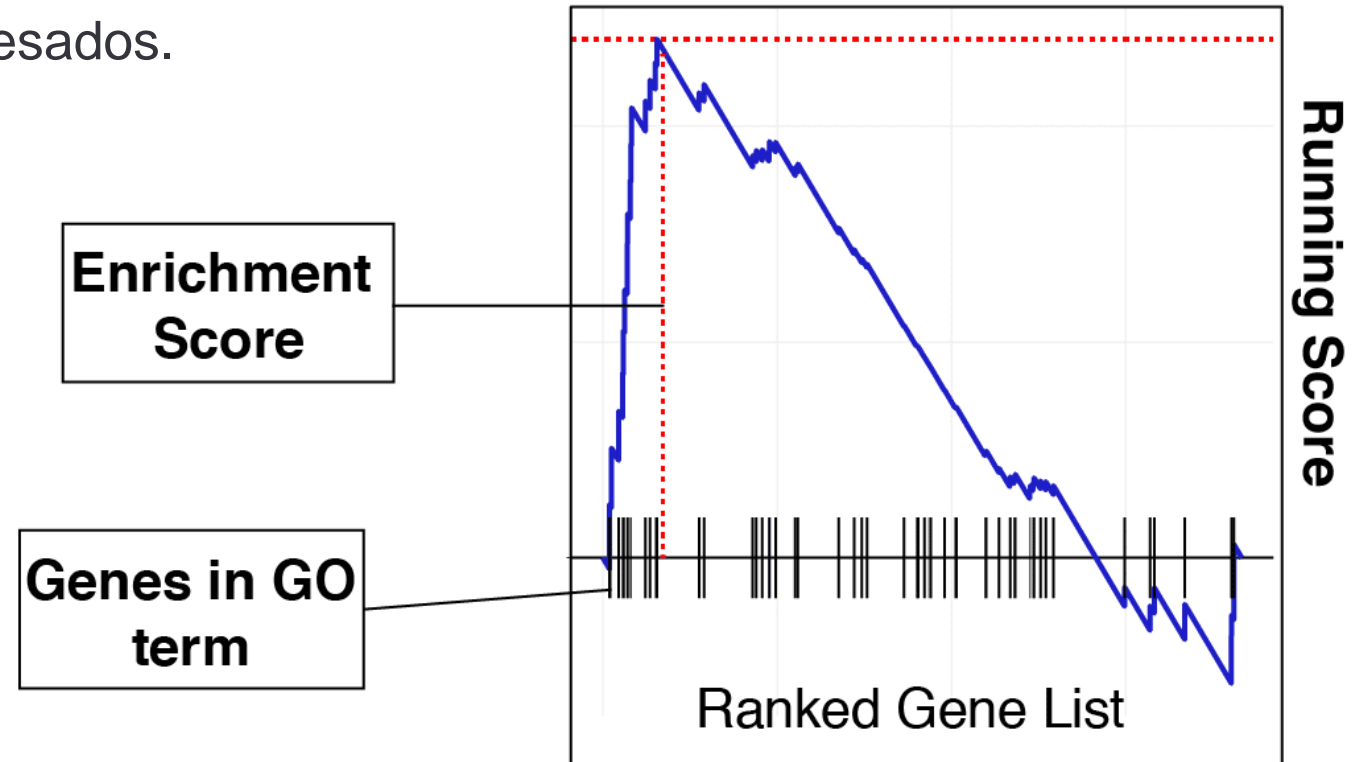
Gene Set Enrichment Analysis (GSEA)

Análisis de funcional de genes expresados.

- Comparación con una distribución hipergeométrica.
- Ejemplo con m&ms

https://www.youtube.com/watch?v=udyAvvaMjfM

GSE function workflow

Input

- gene_list = Ranked gene list (numeric vector, names of vector should be gene names)

- GO_file= Path to the "gmt" GO file on your system.
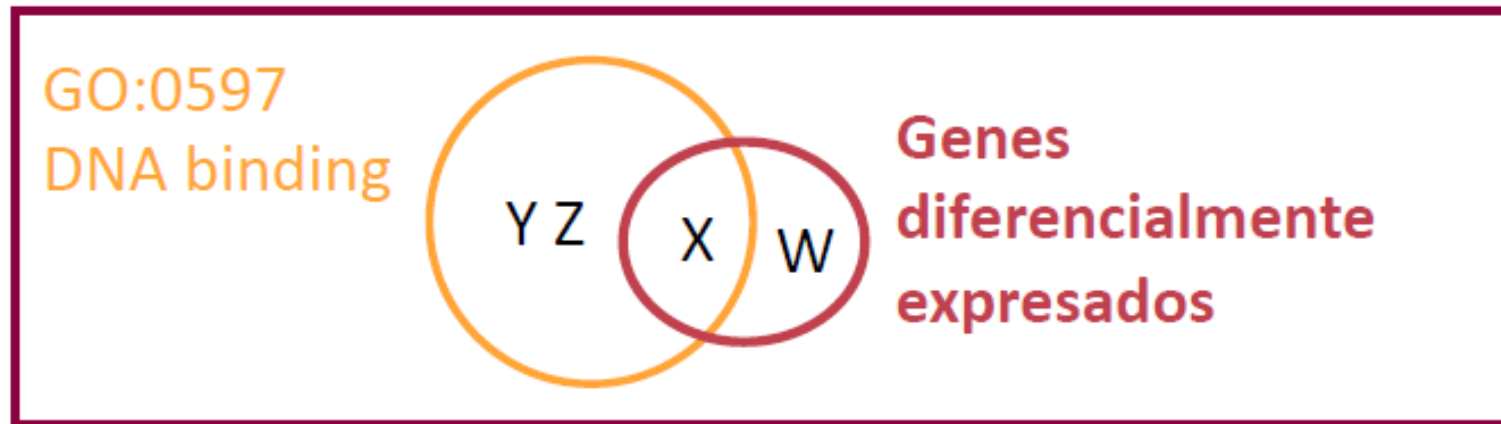
- pval = P-value threshold for returning results
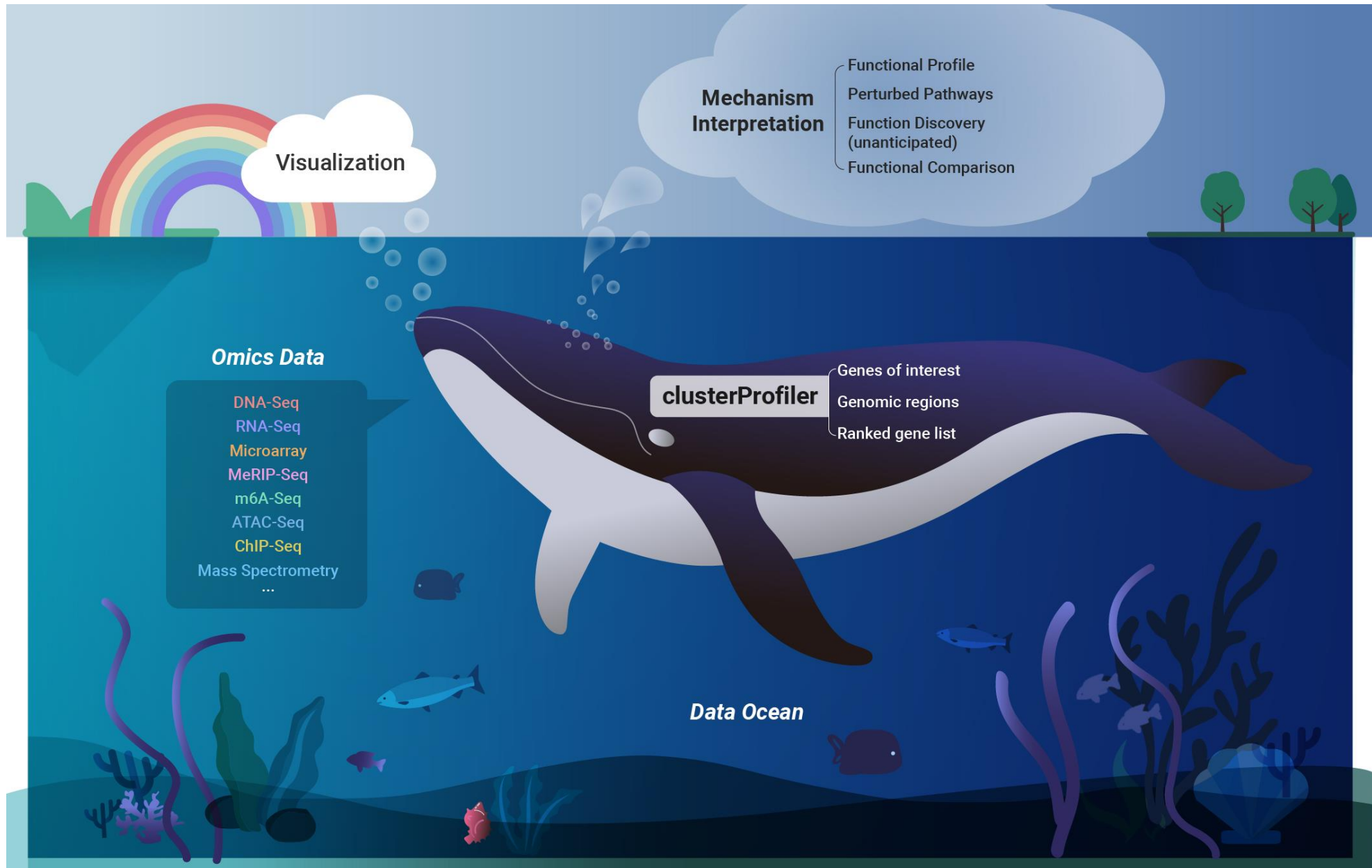
Paquetes

- fgsea, clusterProfiler, EnrichR, Gprofiler2, GORilla, topGO, AnnotationHub, goseq

Comparaciones

- Universo
- Genes expresados

Universo: Genes de ratón expresados en experimento

GO:0597
DNA binding

Y Z X W

Genes
diferencialmente
expresados

https://github.com/YuLab-SMU/clusterProfiler

GOterm

- **BP : Biological process**
  - Oligopeptide transport, response to abiotic stimulus, cell cycle
- **MF : Molecular function**
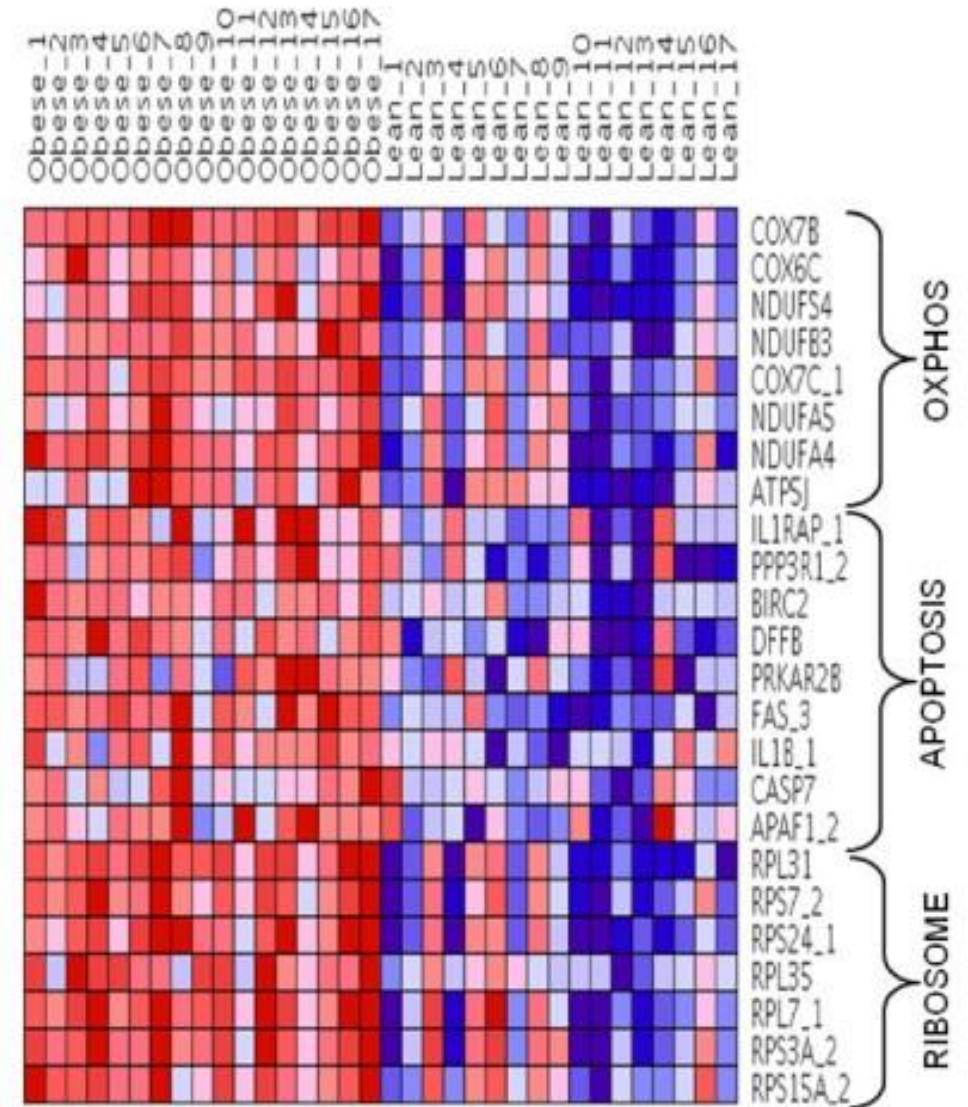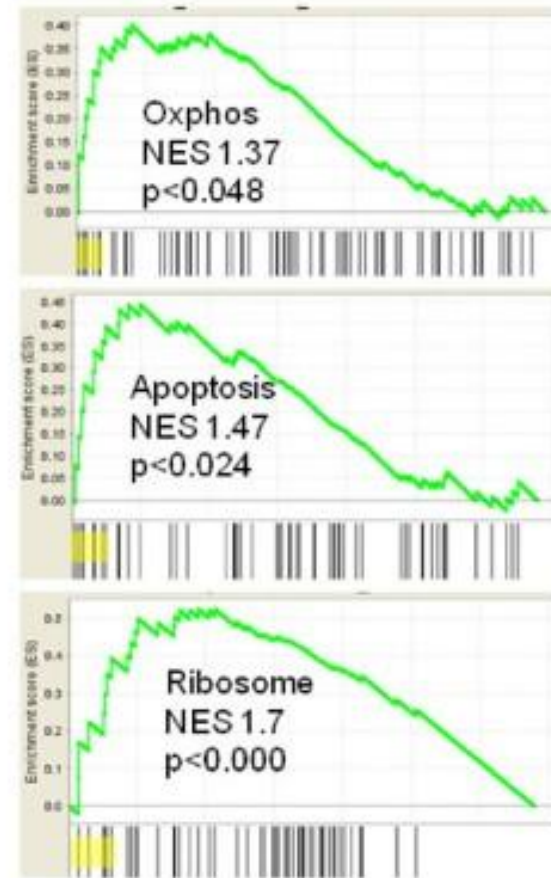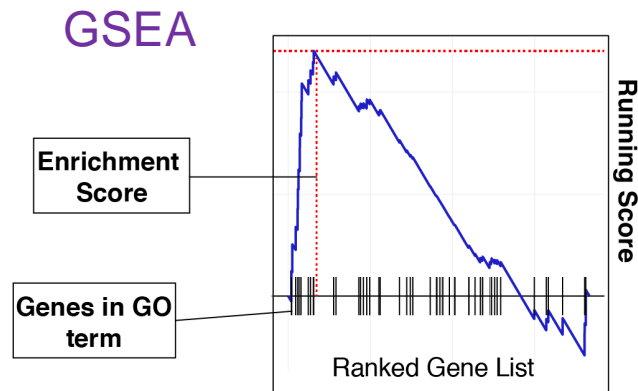 - Identical protein binding, endopeptidase activity
- **CC : Celular component**
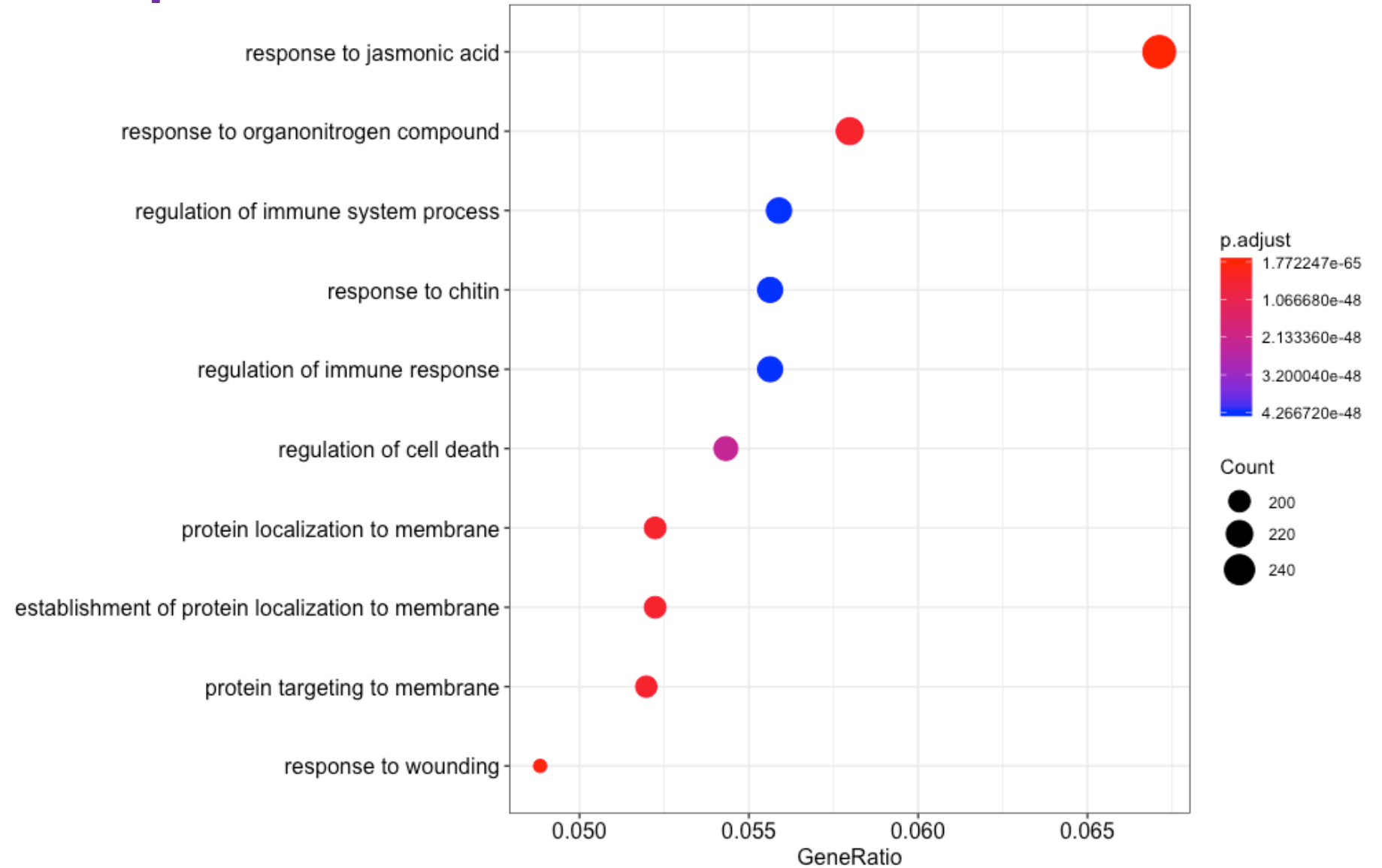 - Apoplast, cell wall, extracellular region, cell surface

KEGG pathway

- Rutas metabólicas / enzimáticas.

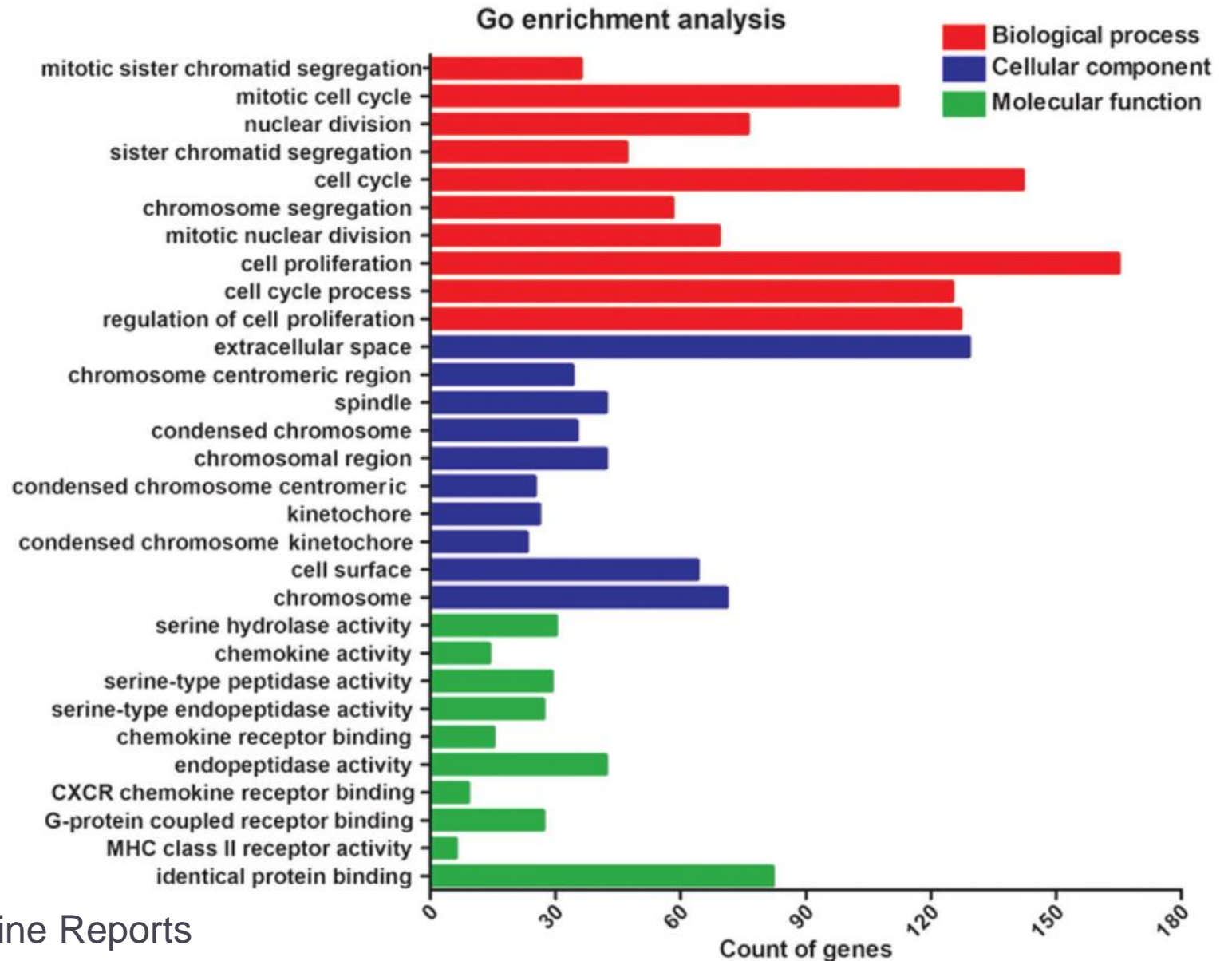# Gene expression profiling in whole blood identifies distinct biological pathways associated with obesity
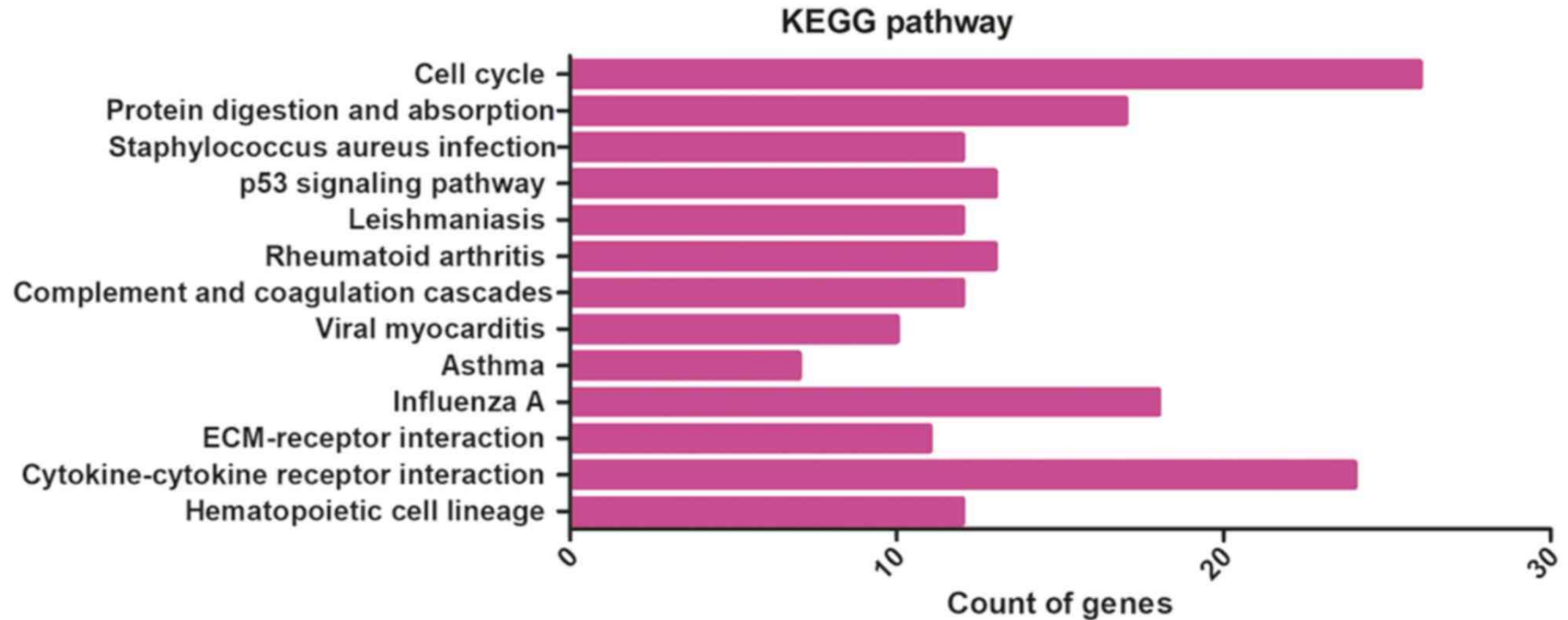

Ghost, *et al.* 2010. BMC Medical Genomics

Tus primeros pasos

GOterm

Identification of putative drugs for gastric adenocarcinoma utilizing differentially expressed genes and connectivity map
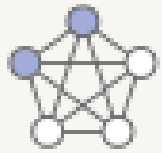

Che, *et al*. 2018. Molecular Medicine Reports

KEGG pathway

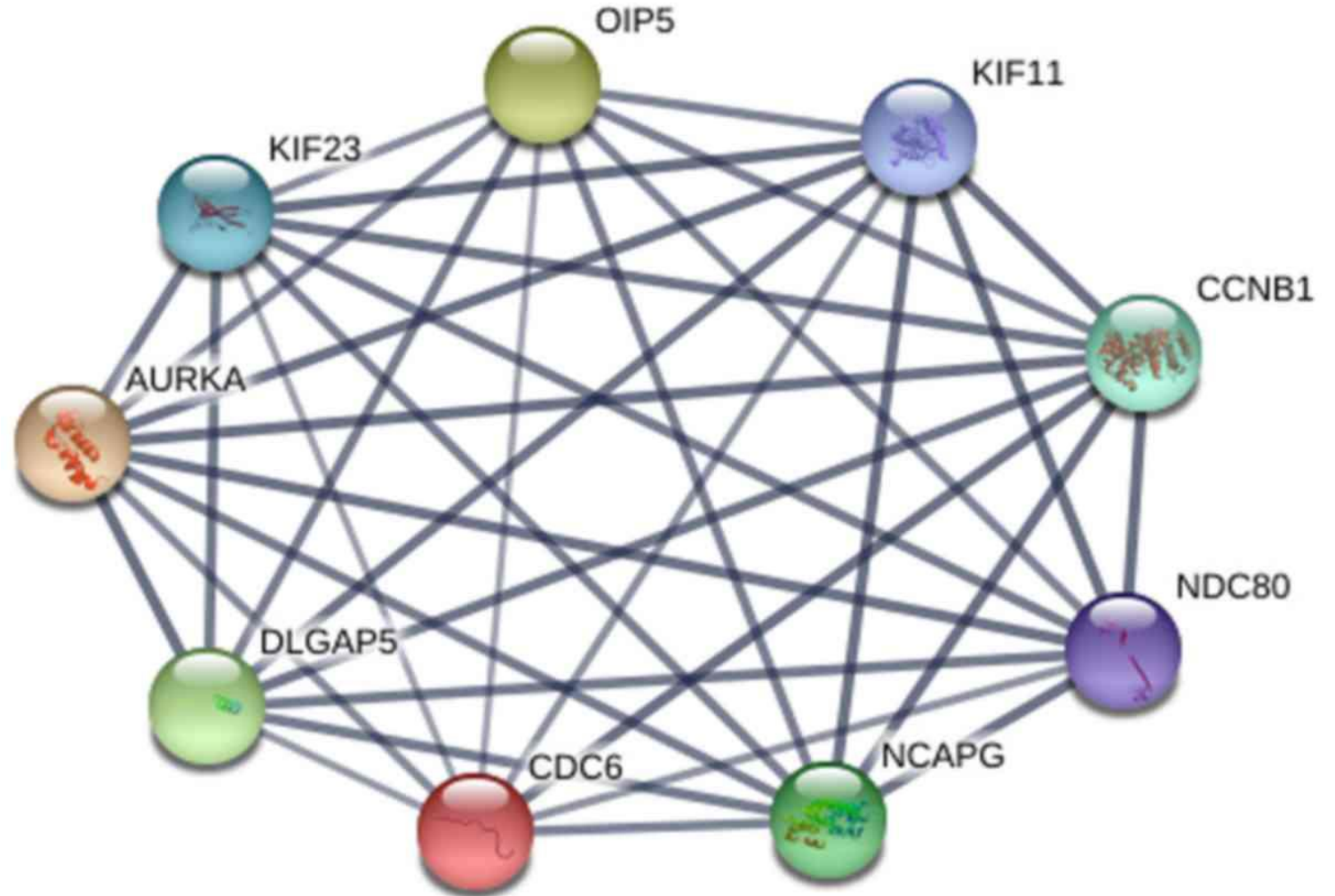KEGG pathway

Che, *et al.* 2018. Molecular Medicine Reports

Redes

Identification of putative drugs for gastric adenocarcinoma utilizing differentially expressed genes and connectivity map

String-db.org
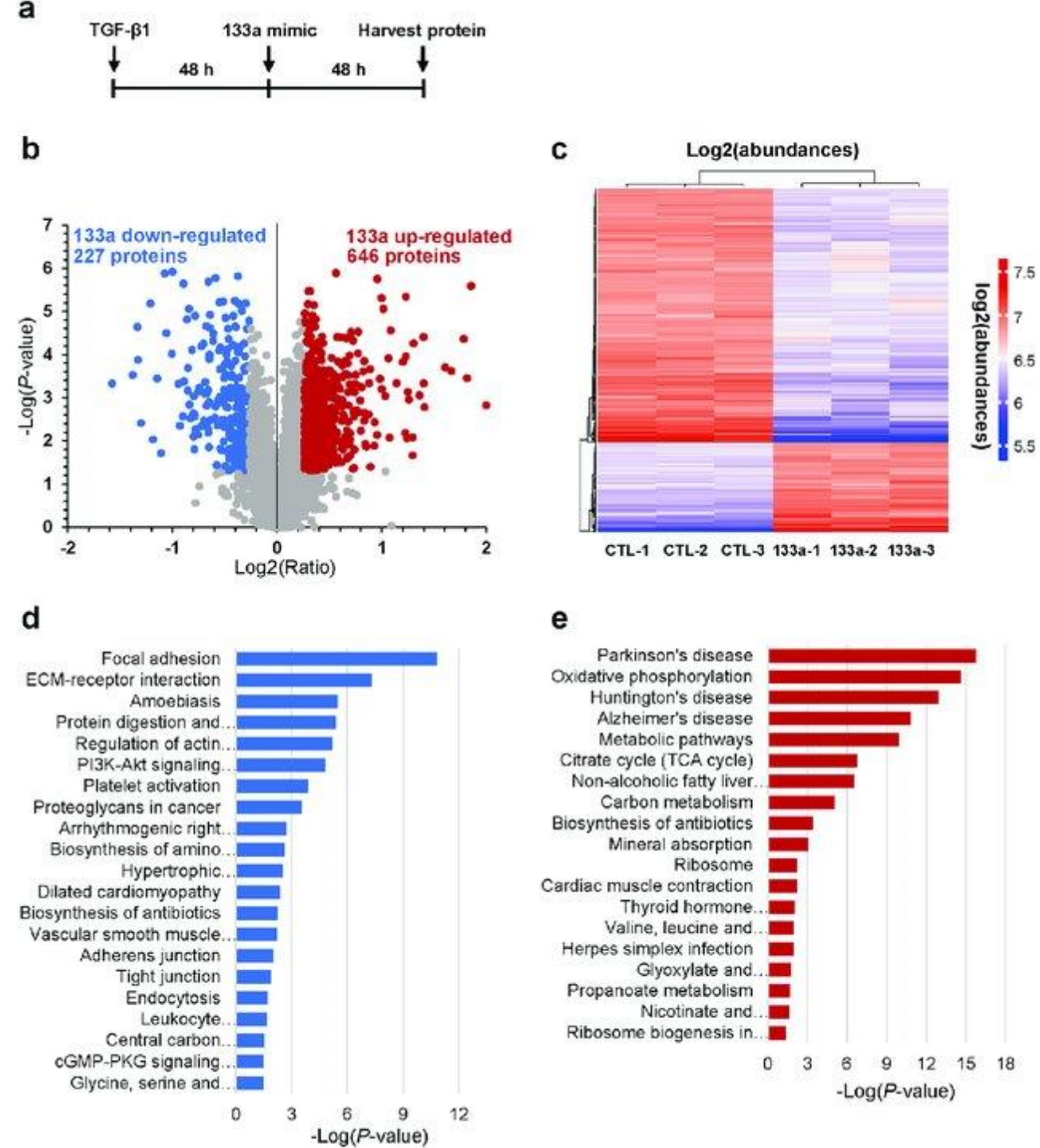
Che, *et al*. 2018. Molecular Medicine Reports   https://www.spandidos-publications.com/10.3892/mmr.2018.9758

Transforming growth factor (TGF)-β1-induced miR-133a inhibits myofibroblast differentiation and pulmonary fibrosis

Wei, *et al*. 2019. Cell Death & Disease

Práctica