CREACIÓN DE GRÁFICOS INTERACTIVOS EN R:

APLICACIÓN AL ANÁLISIS DE DATOS GENÓMICOS DE GLIOMAS

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Servicio de Bioinformática

BIOINFORMATICS SERVICE

- Our main objective is to transform biological data from experimental techniques into valid knowledge.
- **Bioinformatics data analysis of:**
  - Next Generation Sequencing: De Novo seuencing, RNA-Seq, Identification/association of variants, ChiP-Seq, etc.
  - Expression microarrays: differential expression, co-expression, temporal series, marker selection.
  - Protein panels: differential analysis and correlation with phenotypic variants.
  - Sequences: functional annotation, location of transcription factors, phylogenetic studies.
  - List of genes: functional studies, analysis of biological networks, functional enrichment analyses, etc.
- **Visualization of results is a key aspect for a bioinformatics service:**
  - Easy understanding of results
  - Graphs allow to achieve new discoveries
  - Scientific papers are driven by graphs

INTERACTIVE GRAPHS IN R

- Main R packages of Interactive Graphs:
    - Leaflet: Geo-spatial mapping
    - dygraphs: Time series charting
    - MetricsGraphics: Scatterplots and line charts with D3
    - networkD3: Graph data visualization with D3
    - d3heatmap: Interactive heatmaps with D3
    - DataTables: Tabular data display
    - threejs: 3D scatterplots and globes
   - DiagrammeR: Diagrams and flowcharts
- Javascript Advantages
    - Dynamic and interactive representations
    - Vector graphics (easy to get a SVG and a PDF format)
    - Extended functionality to web pages
    - Growing number of JS programmers and public open source projects
    - Active JavaScript graphs libraries: D3, BioJS, etc.
    - Multiplatform: Only a Web Browser is needed for visualization

DATA INTERFACE
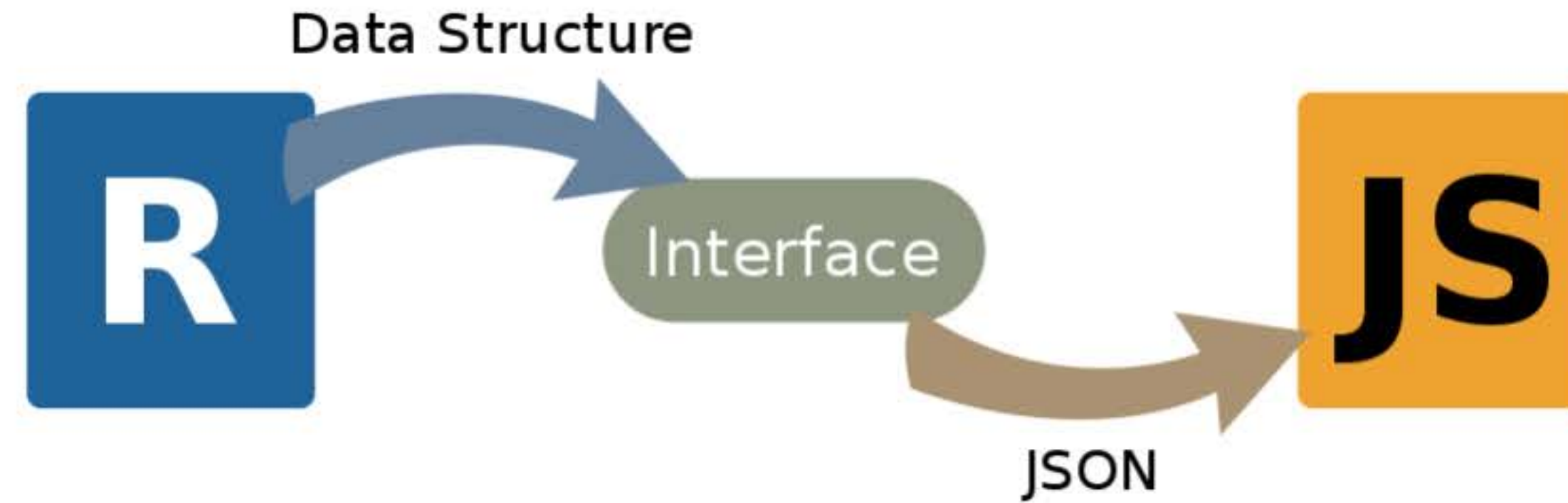
- R interface to transform R Data Structures into JSON format
- It allows easy integration of JS graphs in R
- Enables future public open source project
- Easy generation of dynamic graphs with R

INPUT DATA

- Platforms: Expression and Cytoscan SNPs arrays (Affymetrix).
- Diseases: Gliome and Mielome (different grades)
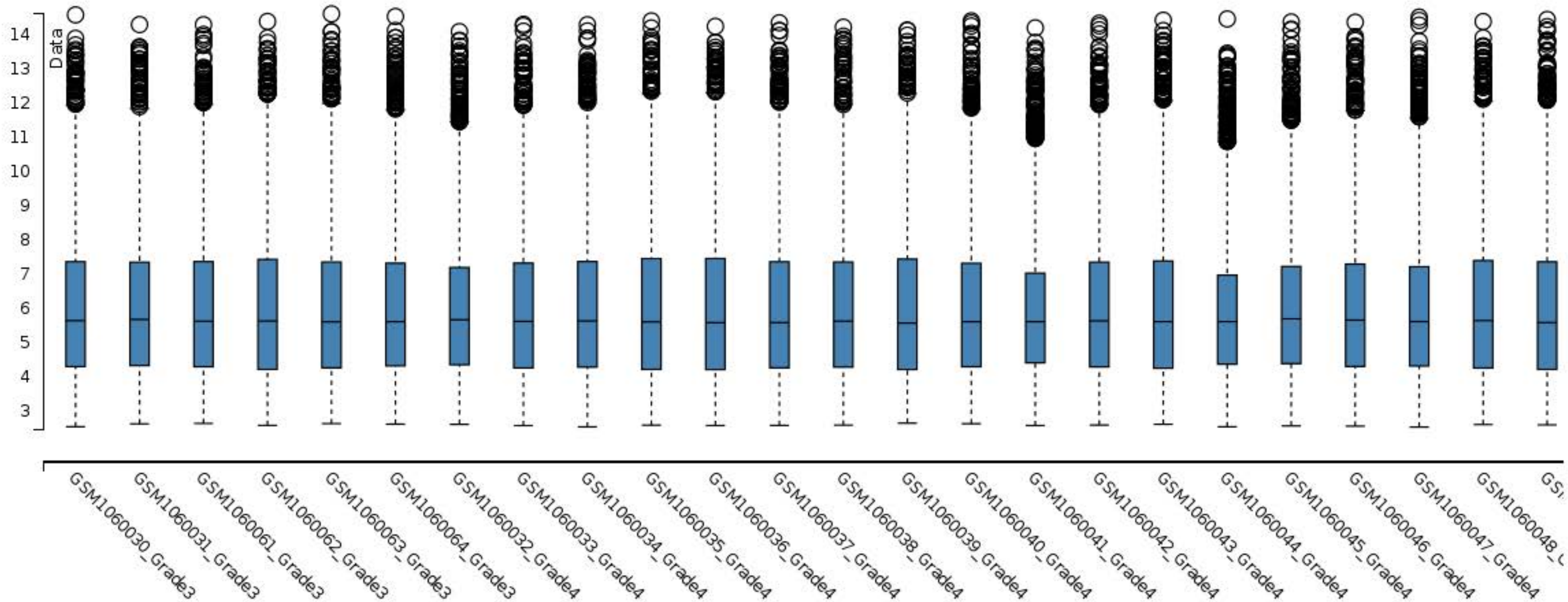- Summary of analysis protocol:

Servicio de Neurocirugía
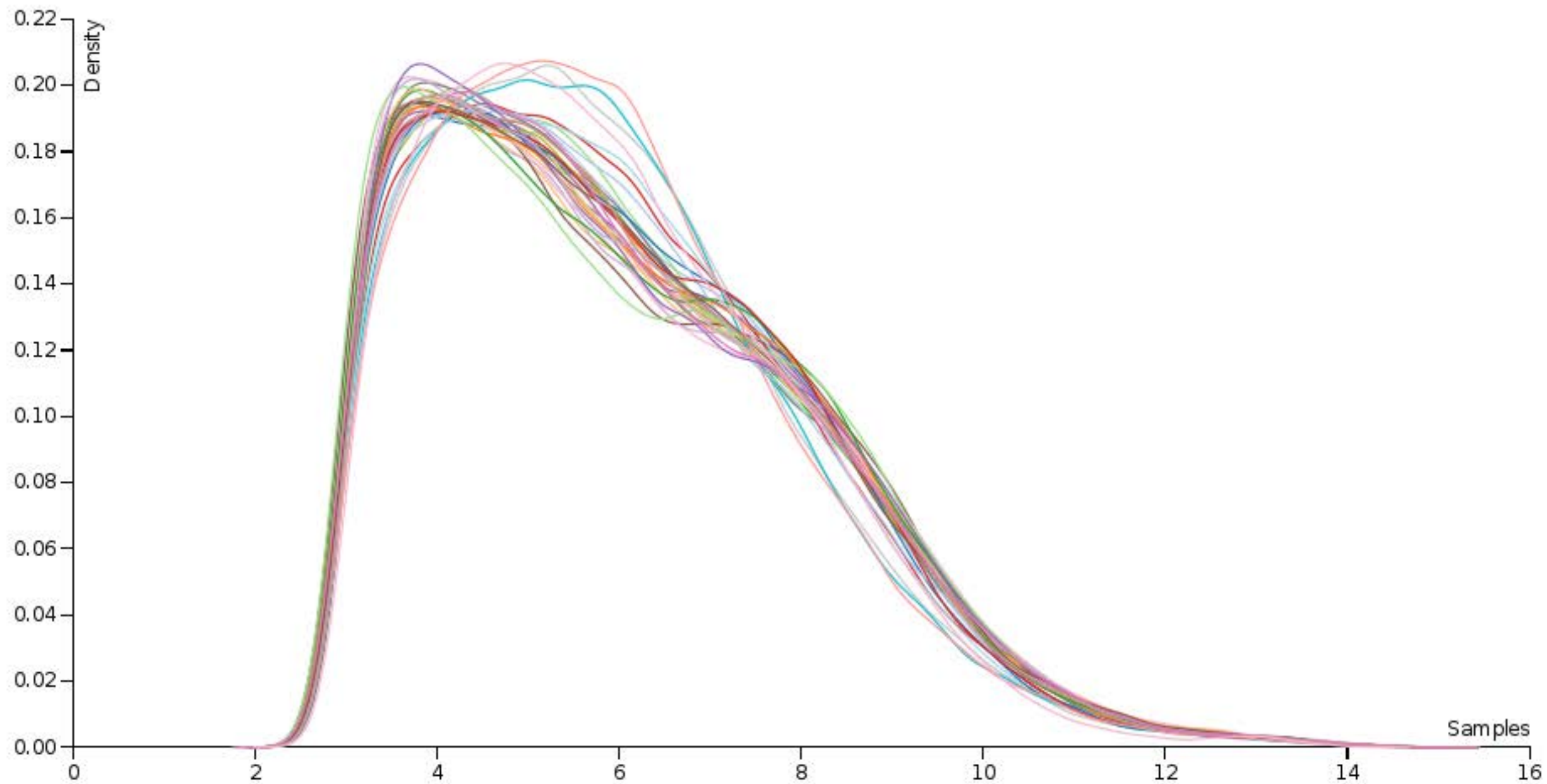Unidad de Investigación del Hospital Universitario de Salamanca (HUS)
Instituto de Estudios de Ciencias de la salud de Castilla y León (IECSCYL-IBSAL)
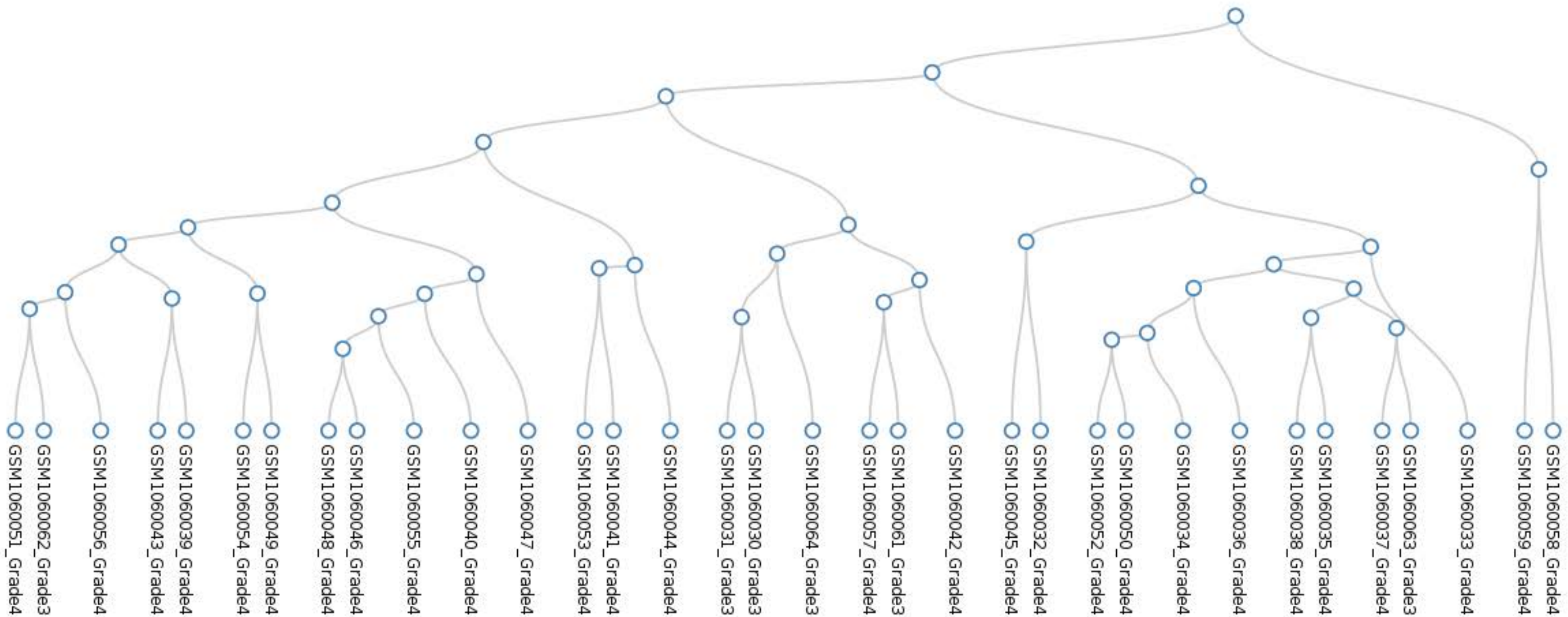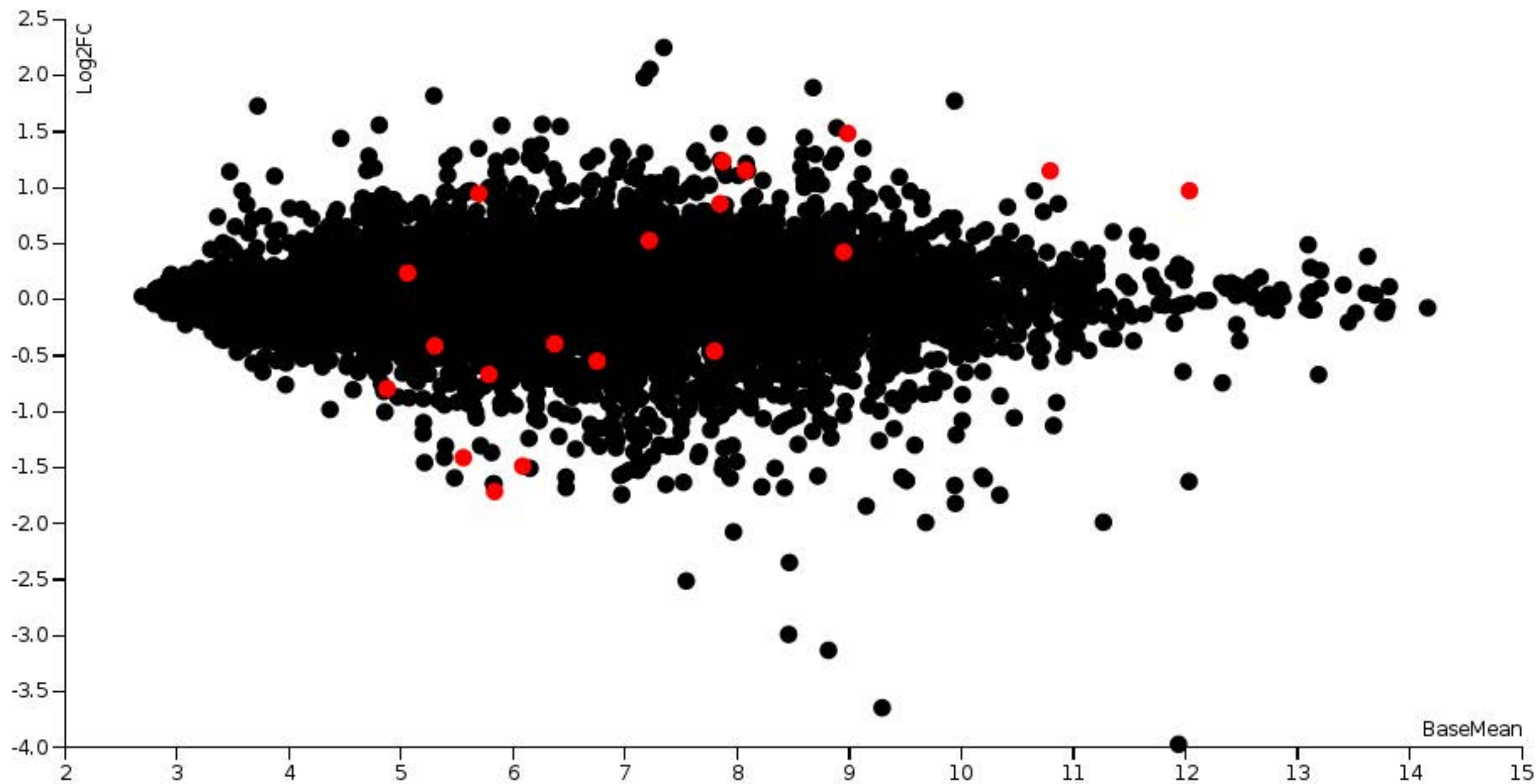
BOXPLOT

DENSITY PLOT

DENDROGRAM

1.83

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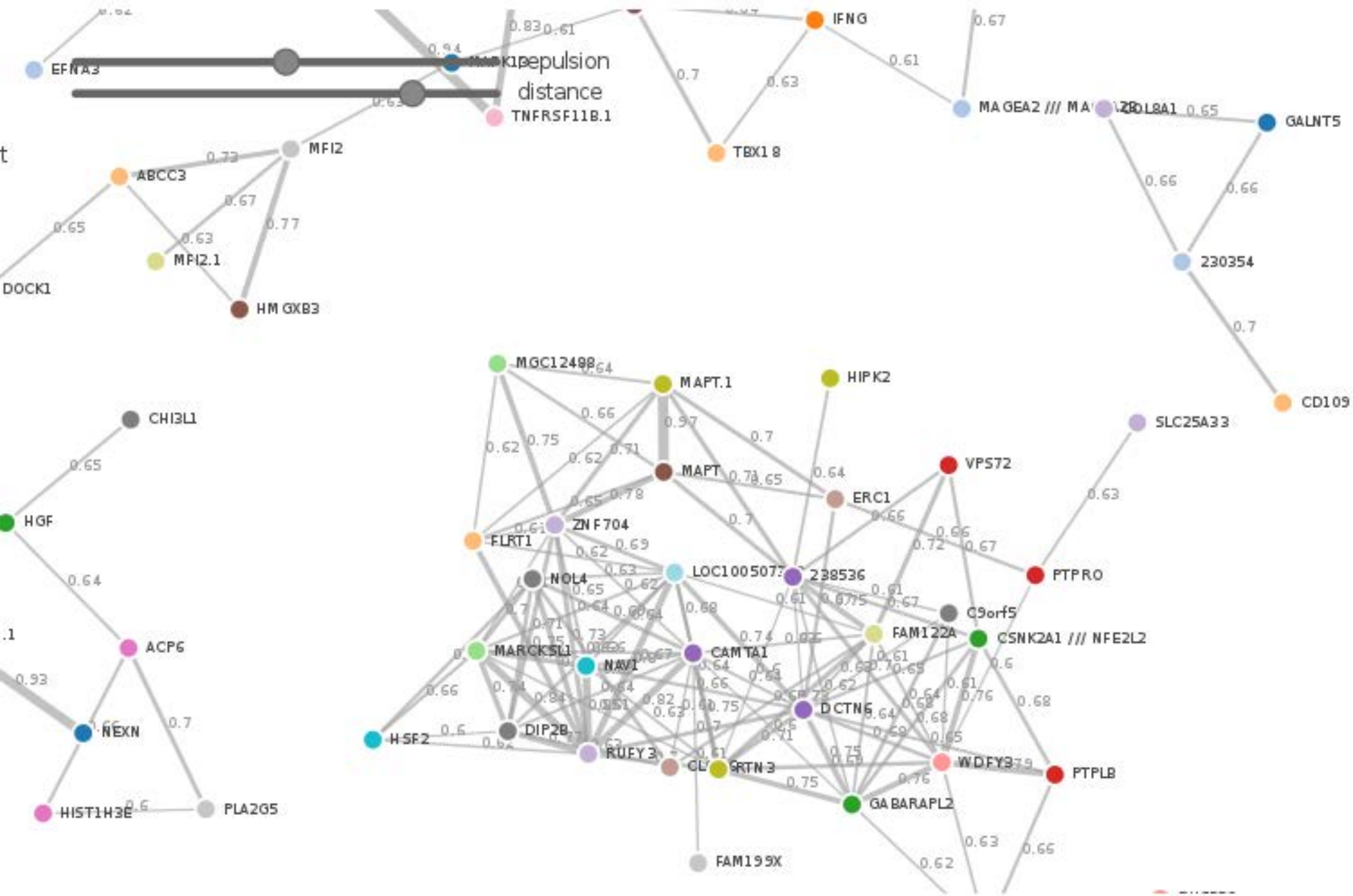211600_at_PTPRO
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NETWORK

SYMETRIC HEATMAP
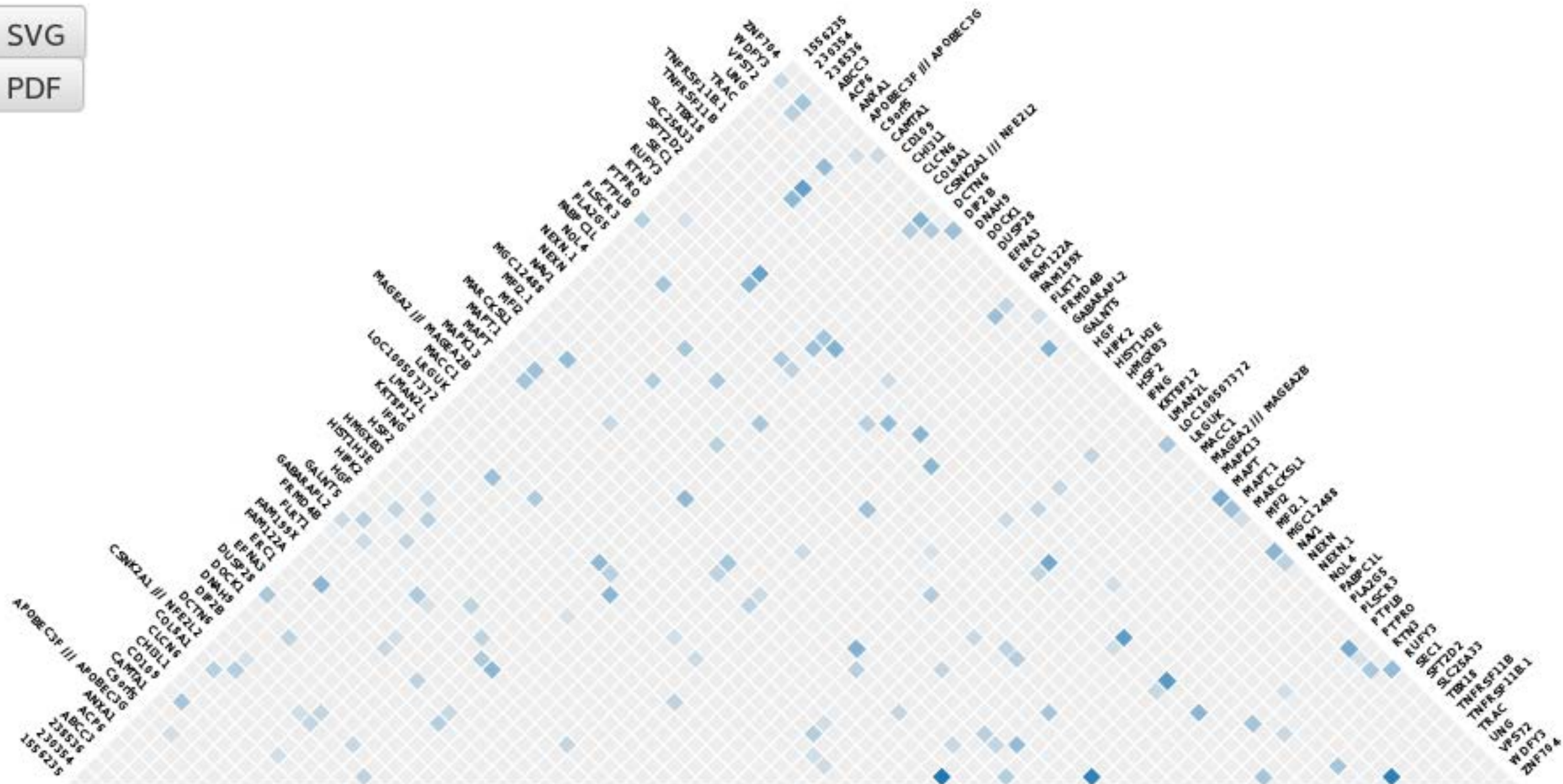
MANHATTAN PLOT

HUMAN GENOME BROWSER

PDF   SVG

1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   X   Y

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Creación de gráficos interactivos en R:
aplicación al análisis de datos genómicos de Gliomas
VII Jornadas de Usuarios de R