

Sahara

Developing an Atlas for Chickpea Breeders

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Chickpea

- Chickpea is the second most widely cultivated pulse crop in the world after common beans.
- Is a great source of plant-based protein
- Around 12 million hectares of chickpeas are cultivated in the world



Taxonomy

Order:	Fabales
Family:	Fabaceae
Genus:	Cicer
Species:	<i>C. arietinum</i>



Problem Statements



Problem Statement

Biotic and Abiotic Stresses

Chickpea production is affected by both living (biotic) and non-living (abiotic) challenges. These include issues like drought, cold temperatures, and fusarium infection.



Plant breeding

Plant breeding is the deliberate and controlled manipulation of plant species to develop new varieties with specific and desirable traits. The goal of plant breeding is to create plants that exhibit improved characteristics such as higher yield, better resistance to pests and diseases, enhanced nutritional content, improved environmental adaptation, and more. It involves applying principles of genetics, biology, and agriculture to achieve desired outcomes.



Plant breeding

Old Plant Breeding

Modern Plant Breeding



Old plant breeding

- > **Observational and Phenotypic Selection**
- > **Limited Genetic Information**
- > **Crossbreeding**
- > **Time-Consuming**



Modern plant breeding

- > **Molecular Genetics and Biotechnology**
- > **Marker-Assisted Selection (MAS)**
- > **Genetic Engineering and Transgenics**
- > **Genome Editing**



Problem Statement

limited Genetic Information

The problem that plant breeders face is the limited annotation of SNPs, which is mainly based on the gene they are located in. Furthermore, the conversion of a marker into a useful tool in the field requires sufficient information about the marker, including its role, when and how to use it, and its relevance to different stresses. Chickpea breeders also lack a complete site that provides them with all the necessary information for enhancing chickpea breeding.



Our Atlas

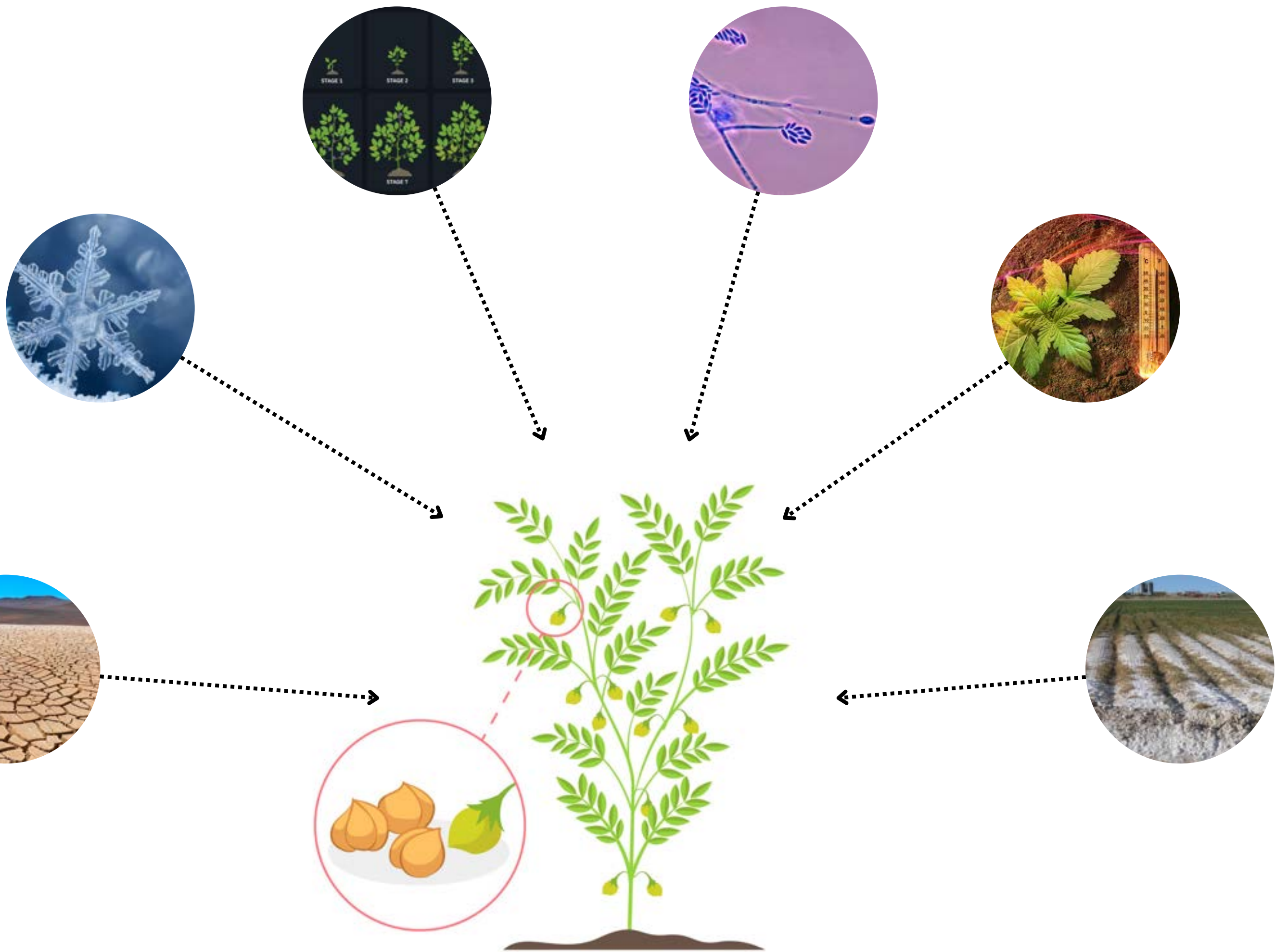


Our Atlas

Objective

Our project aims to develop an Atlas for Chickpea that covers genes affected by different stresses, particularly drought, fusarium, and cold, and includes all genomic information in one place for the breeder. The Atlas will enable breeders to identify the expression of genes under different stresses and learn about the variations, SNPs, and their significance. It will provide breeders with an easy-to-use platform that supports them across different stages of plant breeding





Sahara



Results found in 22 databases

TAXONOMY

Was this helpful?

**Cicer arietinum**

Chickpea (*Cicer arietinum*) is a species of eudicot in the family *Fabaceae* (pea family).

Taxonomy ID: 3827

**Genomes**

Browse and download

**Genes**

Browse and download

**Genome Data Viewer**

Browse the reference genome

**BLAST**

Search the reference sequence

Literature

Bookshelf

12

MeSH

4

NLM Catalog

5

PubMed

2,370

PubMed Central

8,621

Genes

Gene

41,643

GEO DataSets

566

GEO Profiles

0

HomoloGene

0

PopSet

235

Proteins

Conserved Domains

0

Identical Protein Groups

31,262

Protein

4,658,133

Protein Family Models

0

Structure

15



Entry type

DataSets (0)
 Series (51)
 Samples (491)
 Platforms (24)

Organism

Customize ...

Study type

Expression profiling by array
 Methylation profiling by array
 Customize ...

Author

Customize ...

Attribute name

tissue (403)
 strain (13)
 Customize ...

Publication dates

30 days
 1 year
 Custom range...

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Summary ▾ 20 per page ▾ Sort by Default order ▾

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Filters: [Manage Filters](#)

Search results

Items: 1 to 20 of 566

<< First < Prev Page 1 of 29 Next > Last >>

[Gene expression profiling of drought-sensitive \(ICC1882\) and tolerant \(ICC4958\) chickpea](#)

1. [genotypes](#)

(Submitter supplied) We generated the global transcriptome profile of the two chickpea genotypes under control and drought conditions. Approximately 12 million high-quality reads were obtained for each cultivar and different conditions using the Illumina platform. Reference-based assembly was generated for each cultivar and condition. Differentially expressed genes were identified between drought and control conditions for each cultivar.

Organism: **Cicer arietinum**
 Type: Expression profiling by high throughput sequencing
 Platform: GPL31174 8 Samples
 Download data: TXT
 Series Accession: GSE193077 ID: 200193077

[Salinity stress response in chickpea](#)

2. (Submitter supplied) This SuperSeries is composed of the SubSeries listed below.

Organism: **Cicer arietinum**
 Type: Expression profiling by high throughput sequencing; Methylation profiling by high throughput sequencing; Non-coding RNA profiling by high throughput sequencing
 Platform: GPL32287 20 Samples
 Download data: FA, TXT
 Series Accession: GSE204730 ID: 200204730
[PubMed](#) [Full text in PMC](#) [Similar studies](#)

[Epigenetic regulation during salinity stress response in chickpea \(WGBS\)](#)

3. (Submitter supplied) Bisulphite sequencing of salinity sensitive and salinity tolerant chickpea genotypes during

▼ Top Organisms [\[Tree\]](#)

Cicer arietinum (513)
 Helicoverpa armigera (34)
 Phytophthora medicaginis (20)
 Lathyrus sativus (11)
 Lens culinaris (10)

[More...](#)

Find related data

Database: ▾

Search details

"cicer"[MeSH Terms] OR "Cicer arietinum"[Organism] OR Cicer arietinum[All Fields]

[See more...](#)

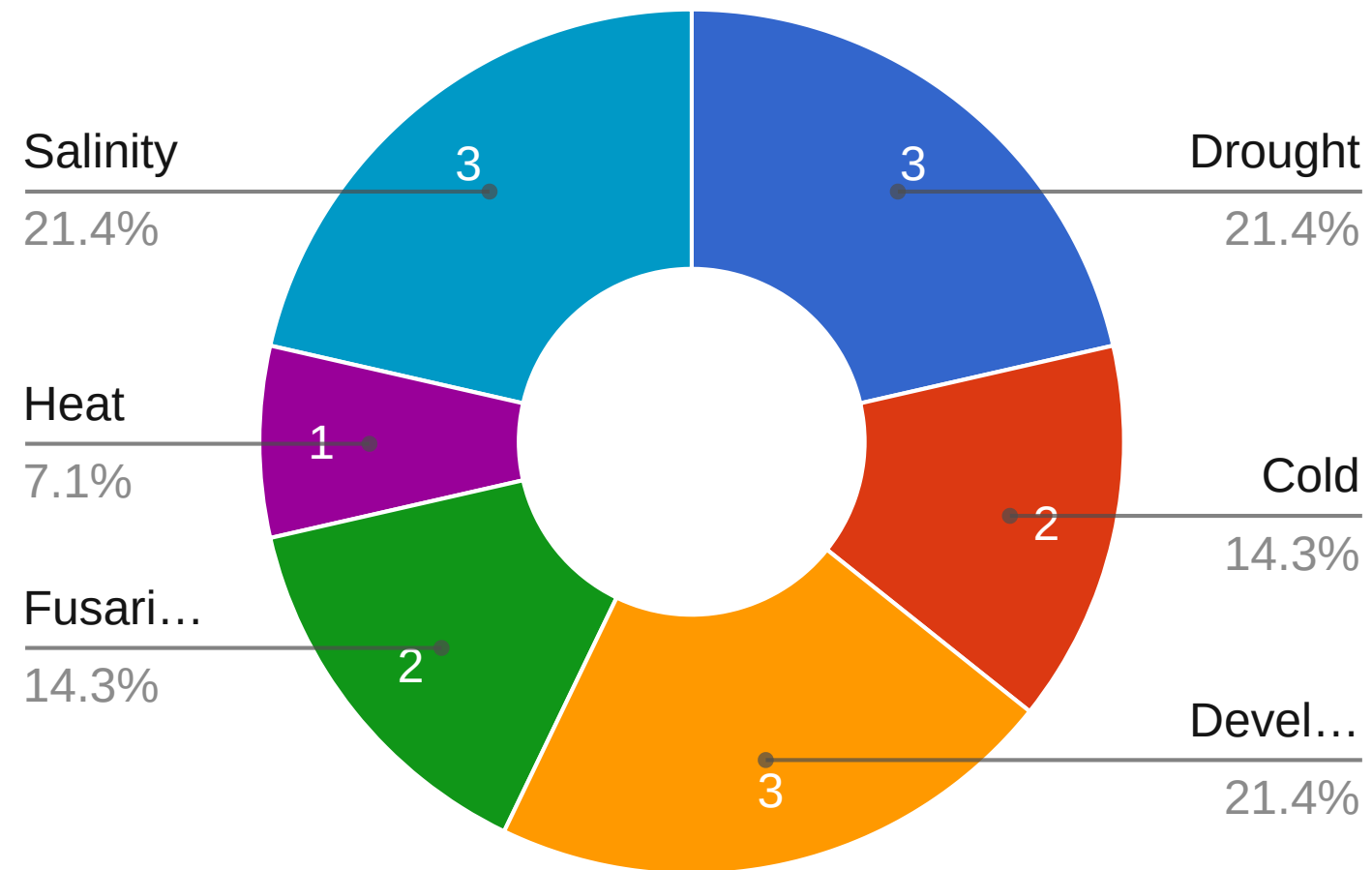
Important Links

[GEO Home](#)

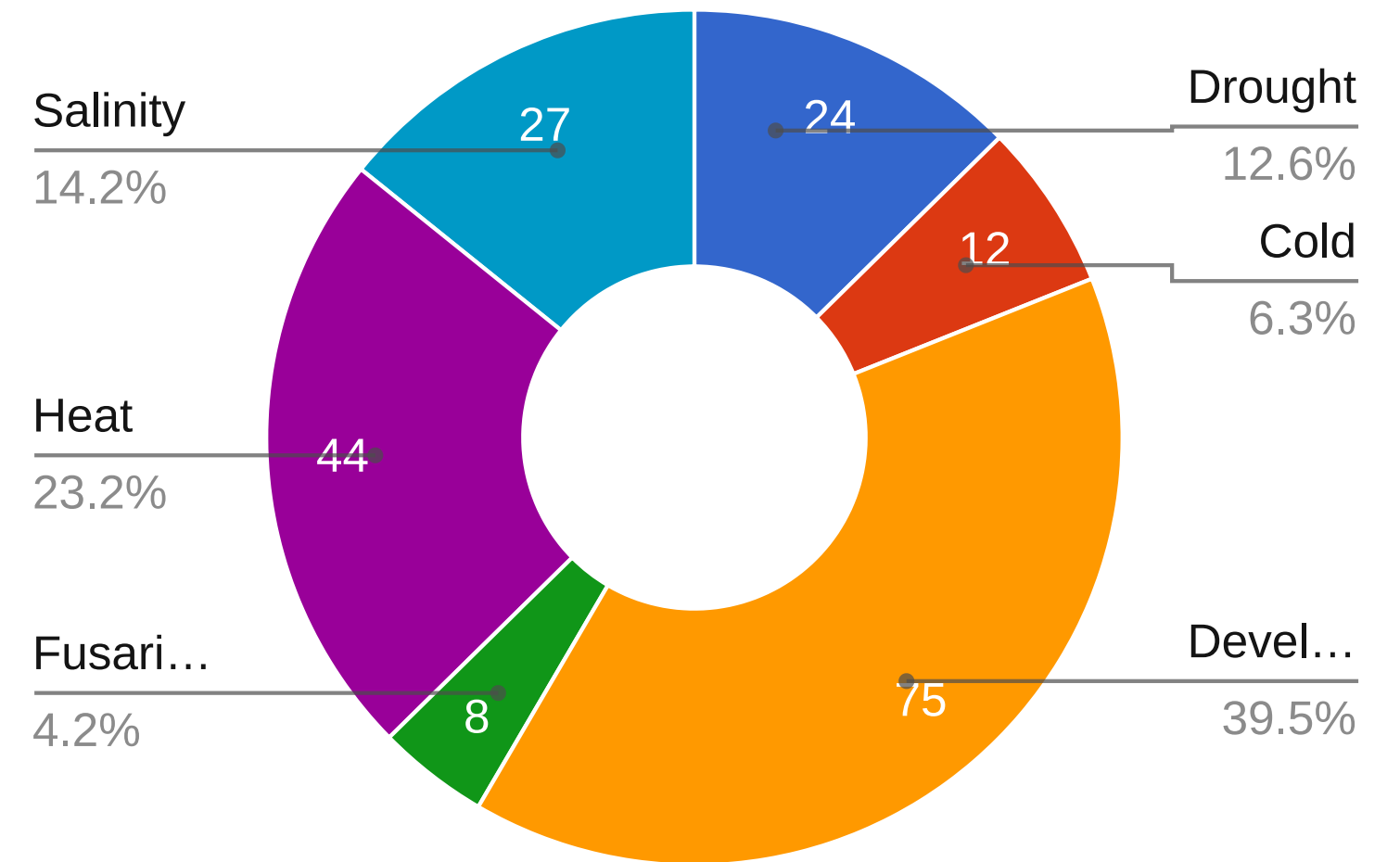
[GEO Documentation](#)

Data Mining

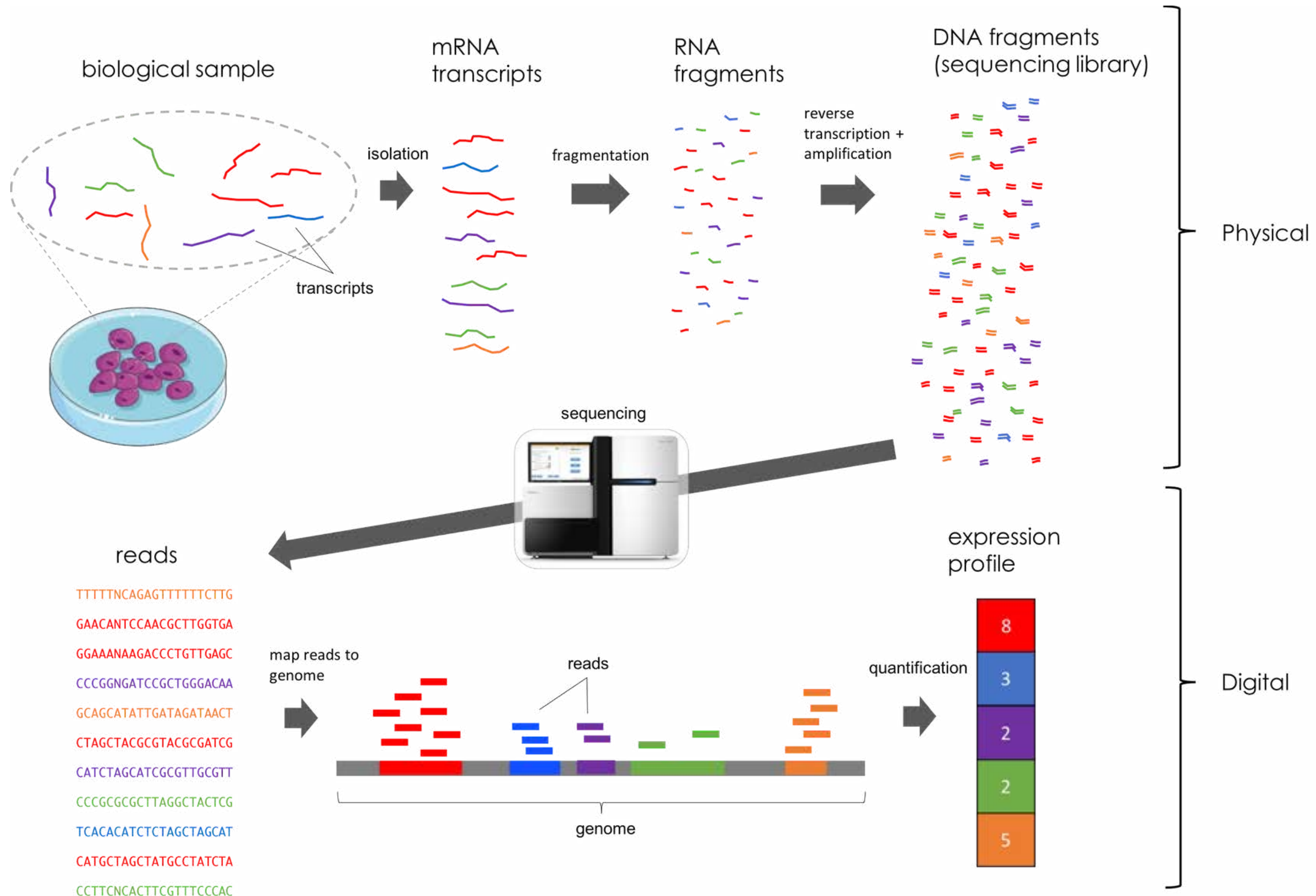
Experiments



Samples



RNA-seq



Shiny Web Atlas

Under Construction

[Click Here for the Source Code on Github!](#)

[Download Small Input Sample File](#)

[Download Mid-Sized Input Sample File](#)

[Download Huge Input Sample File](#)

Choose File to Upload:

Browse... midGenesFile.csv

Upload complete

Low Value:

blue

High Value:

red

Apply Clustering:

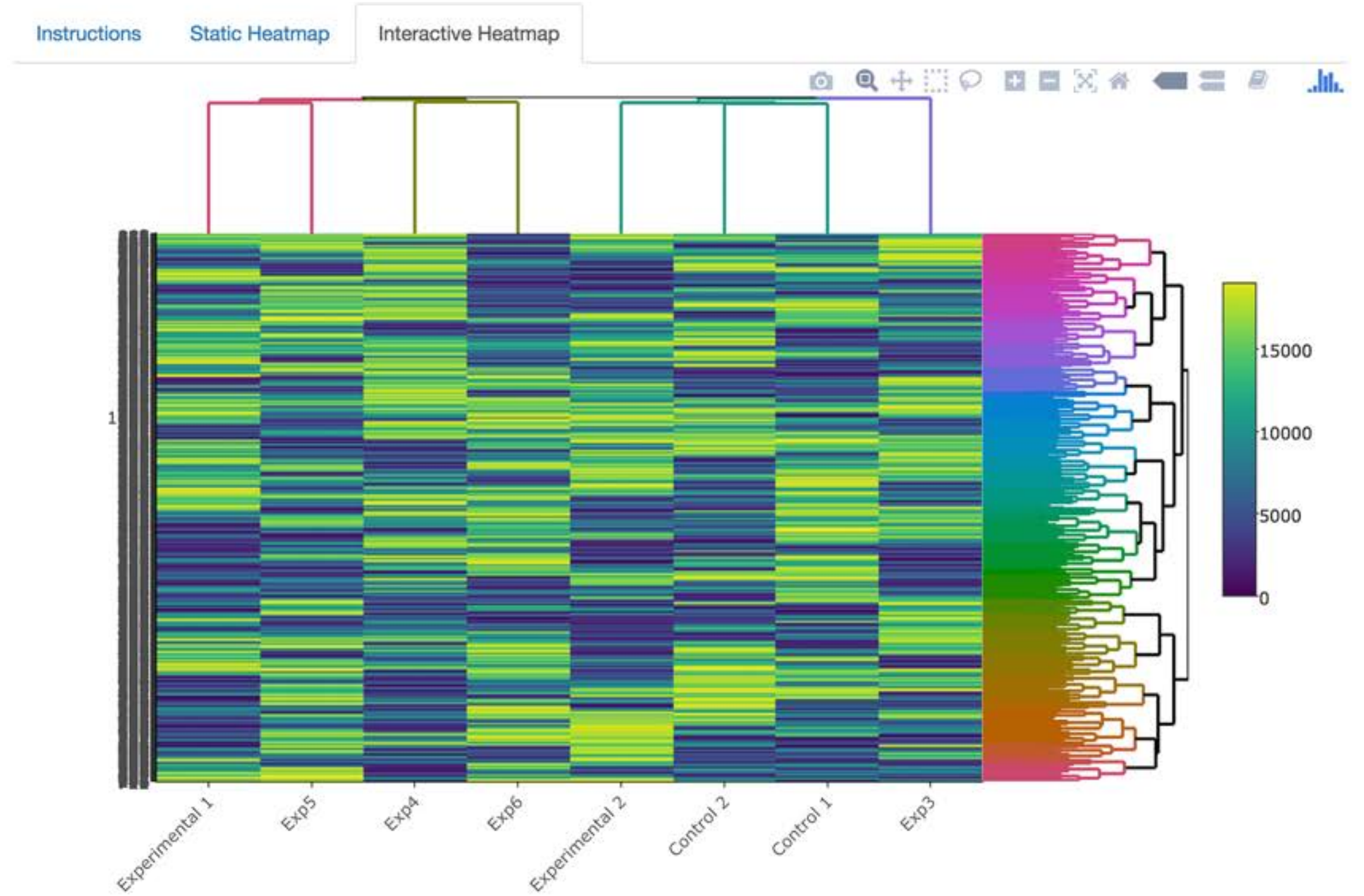
both

Distance Metric:

euclidean

Linkage Algorithm:

complete



Powered by
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**Thank you for
your attention**

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