Computational Genomics

Máster en Bioinformática y Biología Computacional

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Príncipe Felipe Research Center

Goal: biomedical research

- **Basic research** in genes, targets, molecular and cellular processes, Nanomedicine and Computational Medicine
- **Translation into clinical practice**: personalized medicine, cancer, rare diseases, metabolic and functional impairment

http://www.cipf.es/

Who are we?

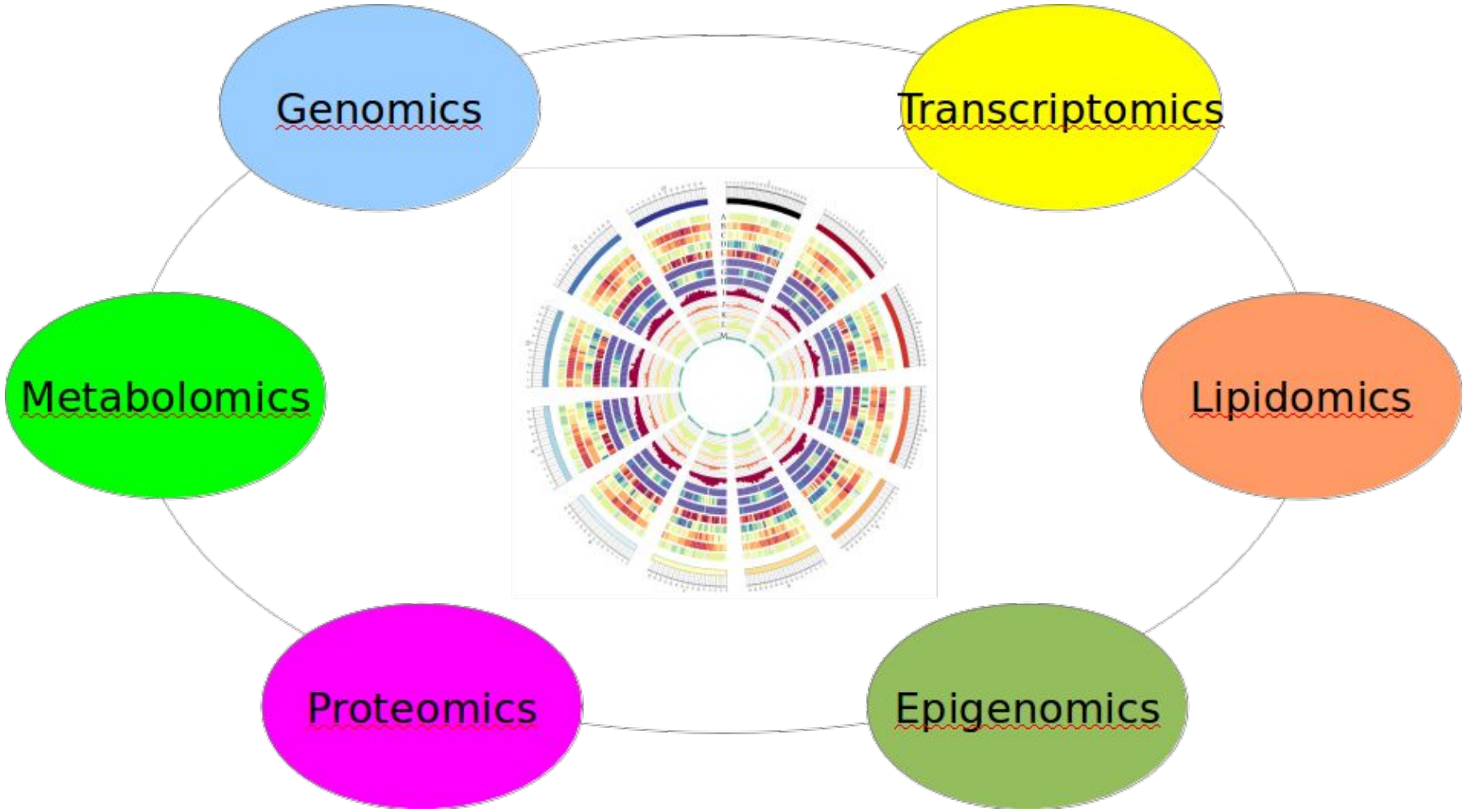
- The **Computational Genomics** Department, in Research Center Prince Felipe

- **Team**: multidisciplinary group of 14 researchers and technicians led by Joaquín Dopazo

http://bioinfo.cipf.es/

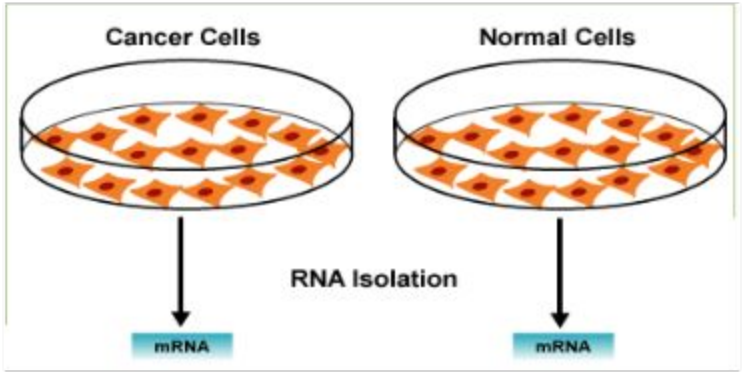
Who are we?

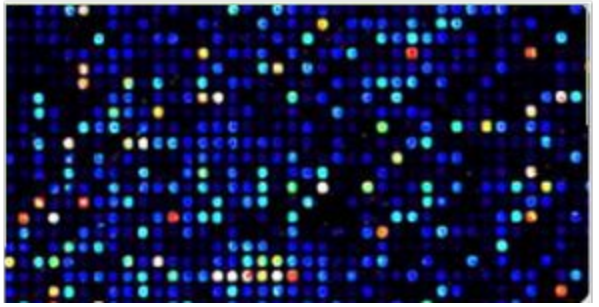
Computational Genomics



Computational Genomics

High throughput technologies: microarrays





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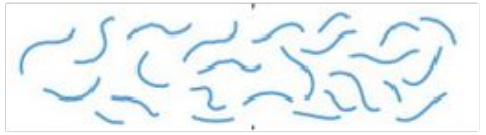
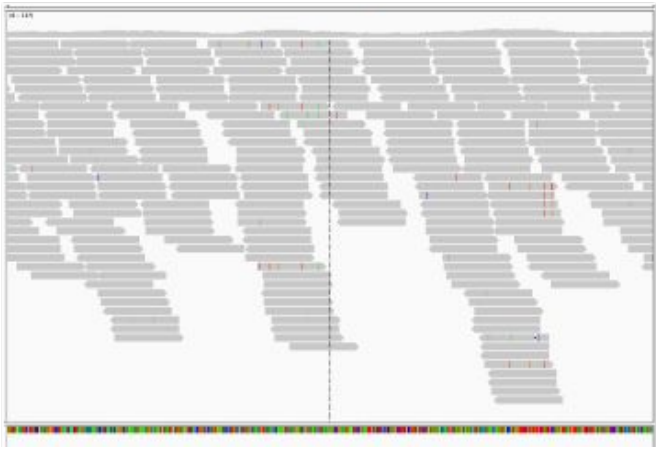
YAL004W		1	0.41	-0.38	-0.89	-1.06
YAL005C	SSA1	1	0.61	-0.07	-1.29	-1.29
YAL010C	MDM10	1	0.16	-0.15	-0.76	-1.25
YAL012W	CYS3	1	0.03	1.39	-0.84	-1.64
YAL015C	NTG1	1	-0.18	-0.18	-0.62	-1.32
YAL018C	YAL018C	1	-0.51	-0.62	-0.76	3.74
YAL025C	MAK16	1	-0.14	-3.32	-1.84	-1.12
YAL034C	FUN19	1	0.19	-0.03	-1.03	-1.29
YAL035W	FUN12	1	0.01	-1.47	-1.15	-0.69
YAL036C	FUN11	1	-0.15	-2.74	-1.79	-1.32
YAL038W	CDC19	1	-0.06	-1.89	-1.69	-2.32
YAL040C	CLN3	1	-0.17	-2.25	-1.69	-2.25
YAL054C	ACS1	1	0.51	2.6	1.9	1.7
YAL055W	YAL055W	1	-0.32	0.83	0.58	0.82

Computational Genomics

High throughput technologies: Next Generation Sequencing





Reference genome

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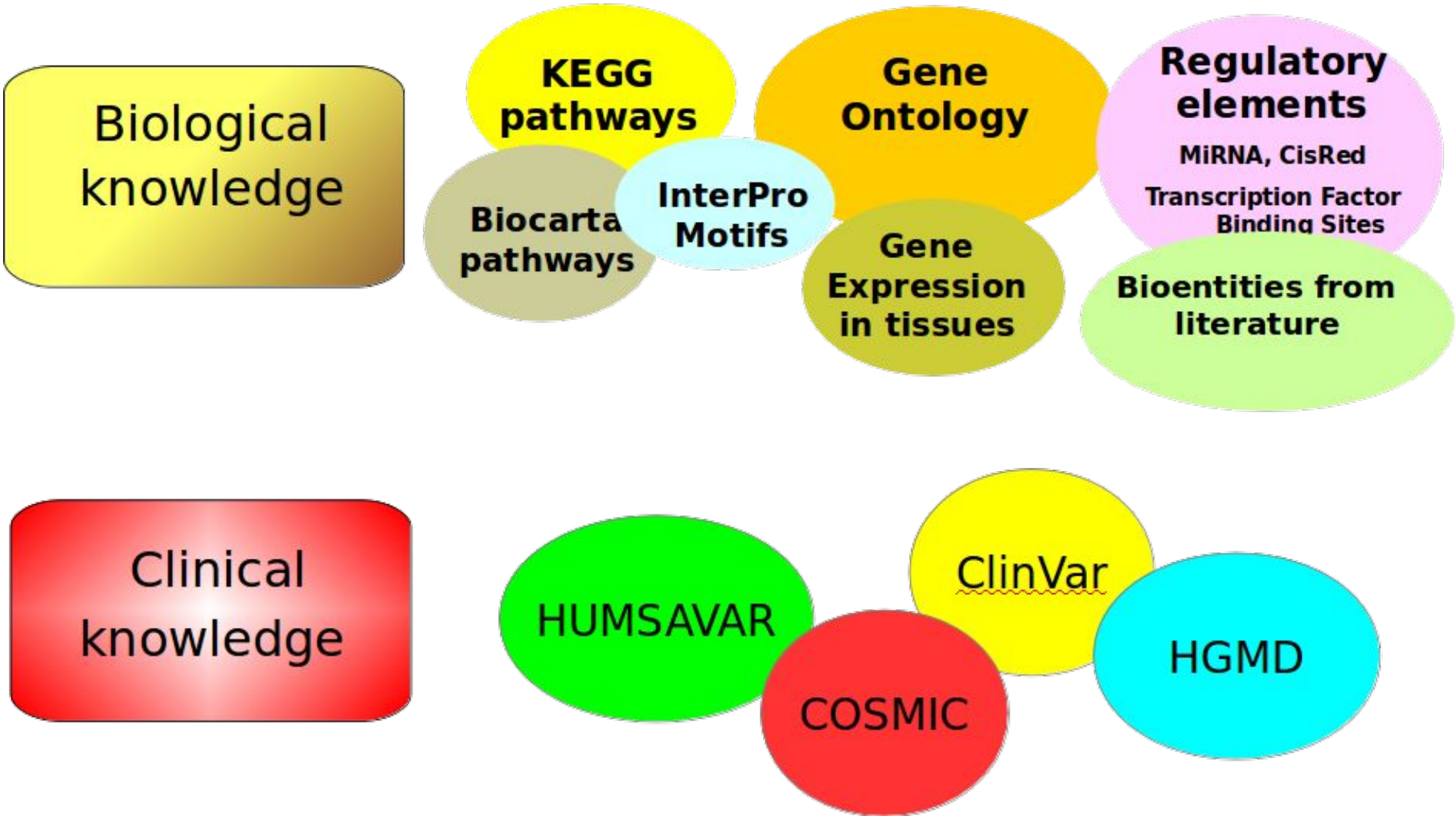
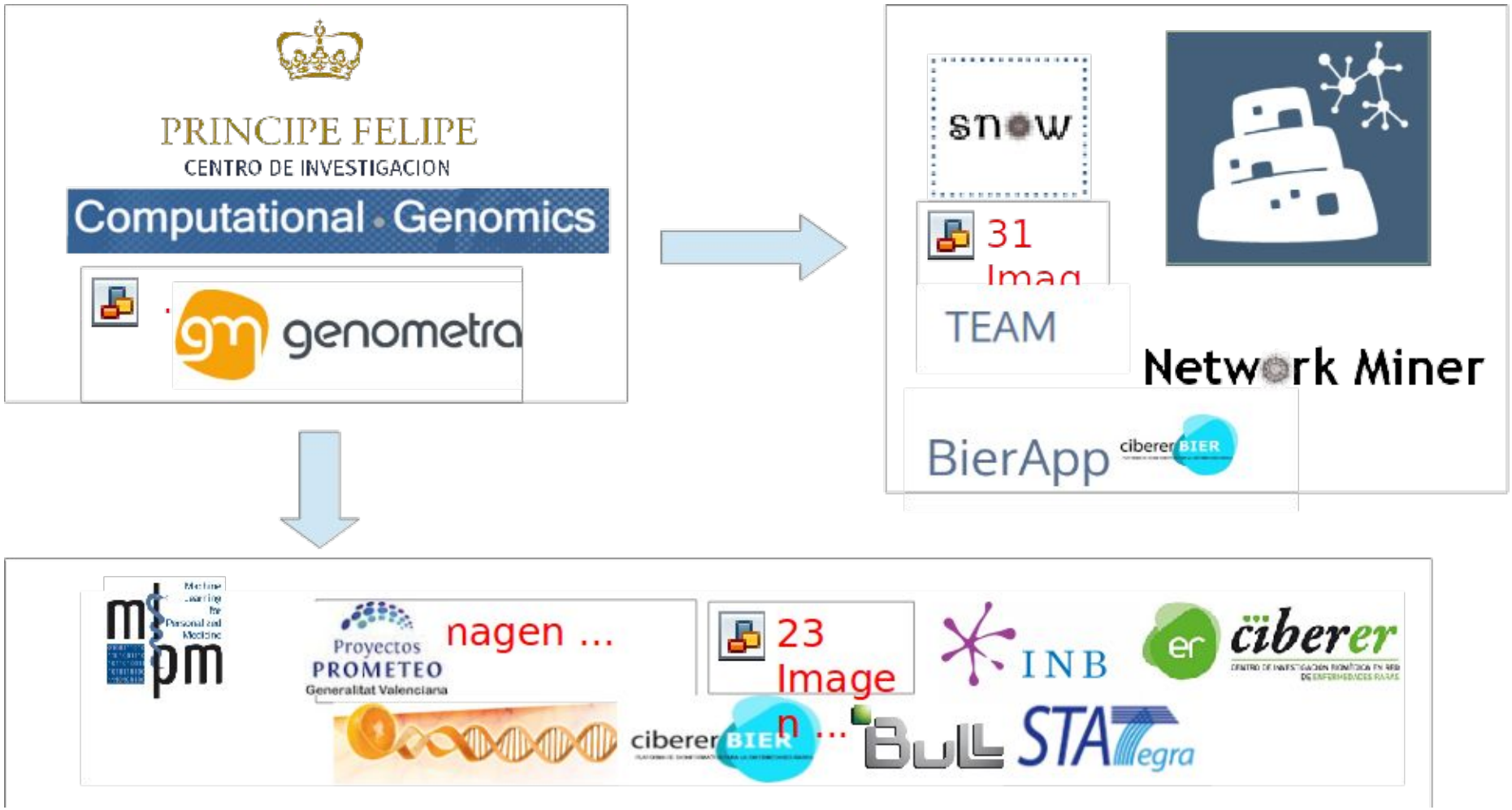


How do we work?



How do we work?

IT4Innovations
národní superpočítačové centrum

OMICS MASTER

Outline

1. Introduction to Babelomics
2. Functional Profiling: over-representation methods
3. Unsupervised Classification: Clustering
4. Supervised Classification: Prediction

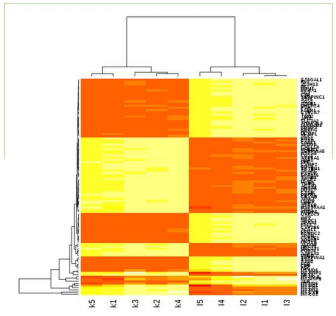
Outline

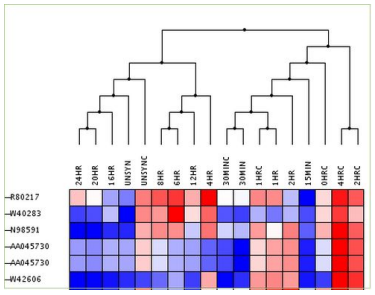
Design

Processing

- Differential expression
- Clustering
- Predictors

Functional profiling





Any questions?