

VizFaDa: Visualisations of FAANG data

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Abstract

- > Functional Annotation of Animal Genomes (FAANG) is an open consortia gathering genome regulation data in farmed animals: 🐑 🐷 🐄 🐮 🐾 🐔 🐟
- > Raw genomic data and rich sample metadata are freely available through a data portal hosted at EMBL-EBI: data.faang.org
- > We aim to provide data visualisations of FAANG datasets (RNA-seq, ChIP-seq, DNA methylation), embedded to the FAANG data portal.
- > Visualisations will provide an overview of the available data to foster data re-use.

Data processing nextflow & nf-core

Nextflow pipelines based on nf-core:

- > A Nextflow module to get metadata & download data
- > Fast RNA-seq quantification using Salmon pseudo-aligner
 - o Pearson correlation on log₁₀(TPM + 1)
- > ChIP-seq processing using bwa and macs2
 - o Jaccard index from bedtools

Notable by-products

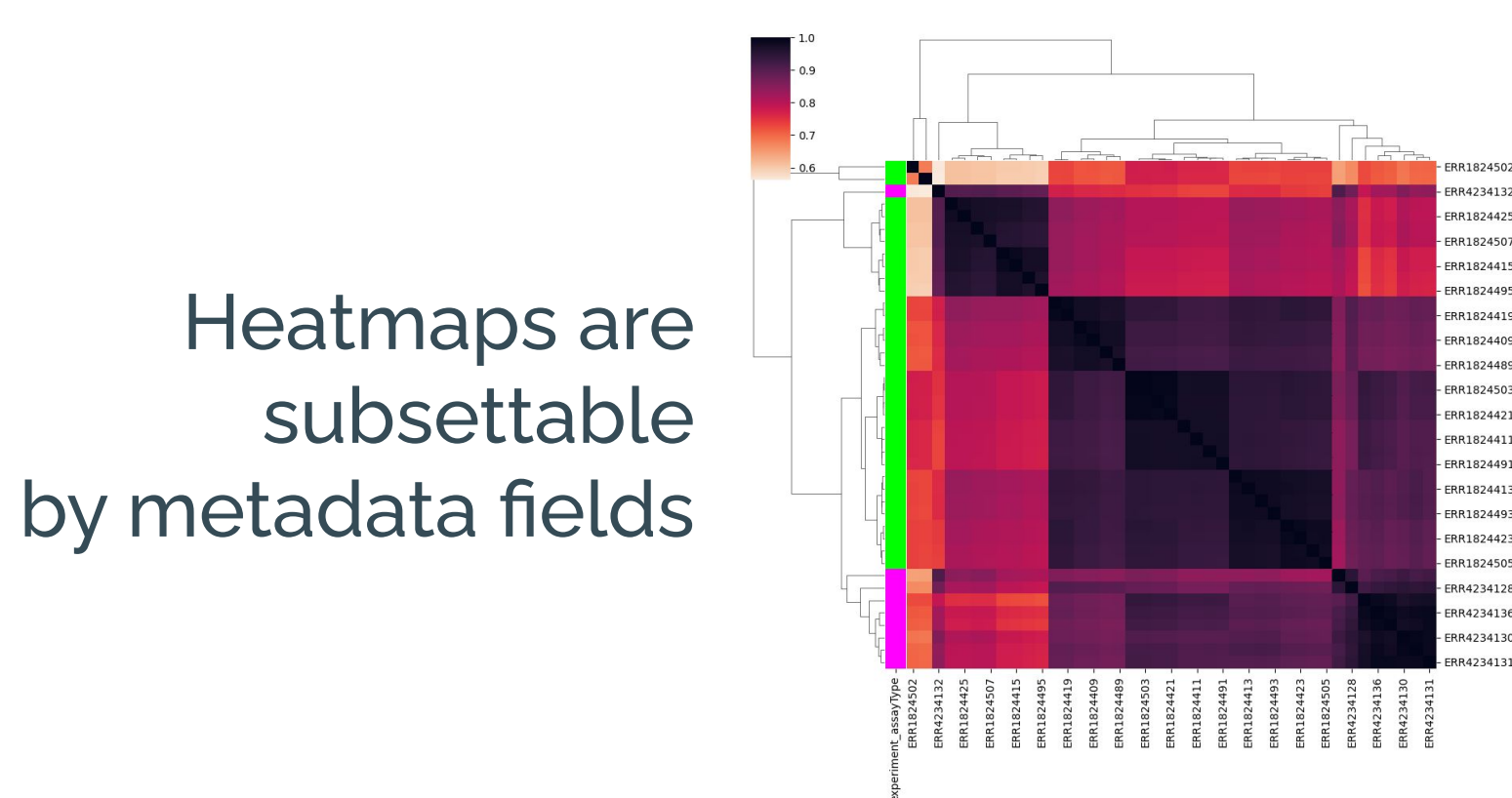
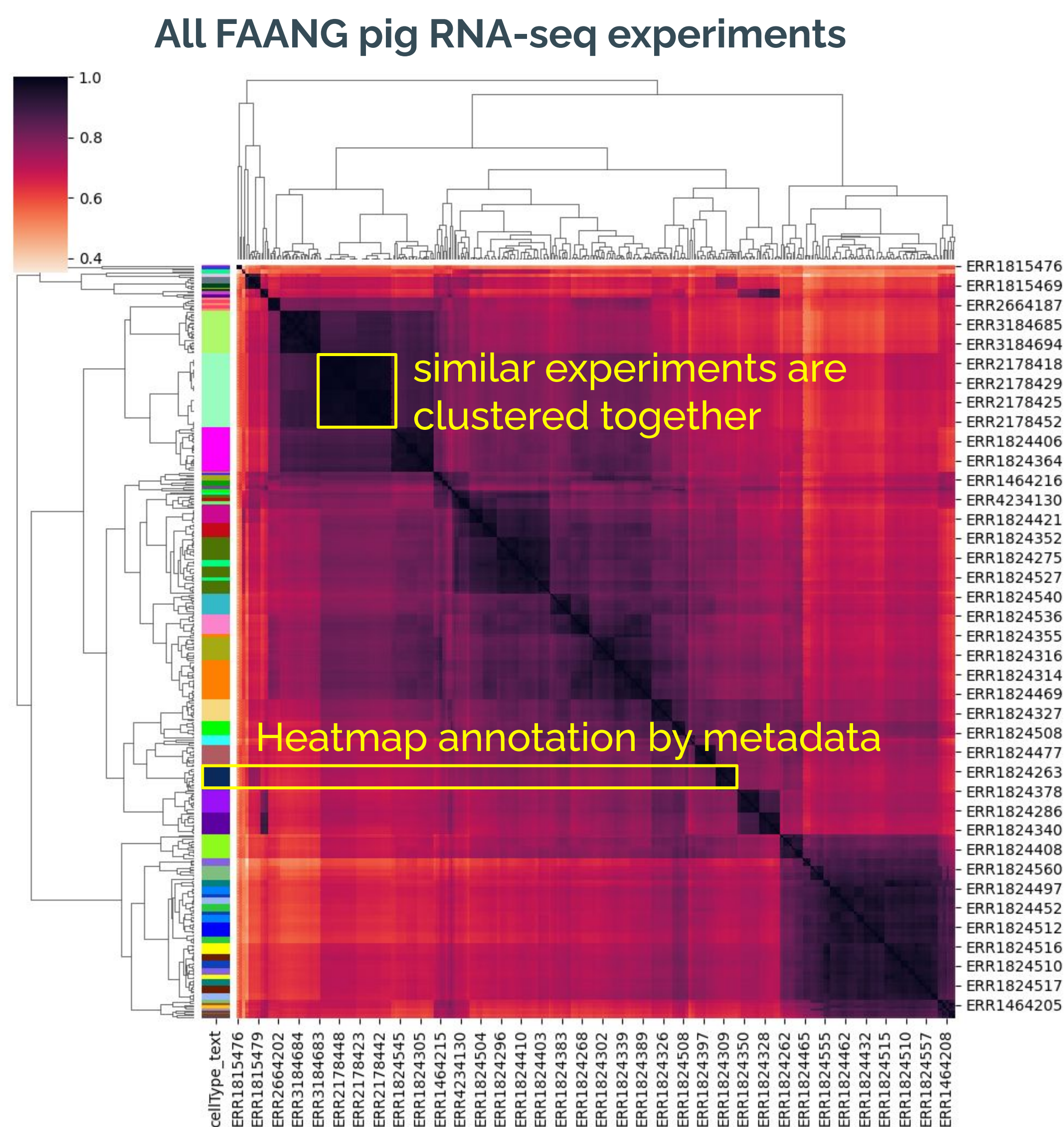
Uniformly processed outputs on FAANG data:

- > FastQC reports
- > Gene and transcript expression matrices (count & TPM)
- > ChIP-seq peaks and bigwig tracks

Sample-to-sample correlation heatmaps

By species and by experiment types (RNA-seq, ChIP-seq, DNA methylation)

- > overview of available data
- > visualising the relationships between samples
- > outlier identification



Heatmaps are subsetting by metadata fields

- Soon: upload your own data
- > RNA-seq: gene expression table (count, TPM)
 - > ChIP-seq: peak bed file

Epigenetic profiles at TSS

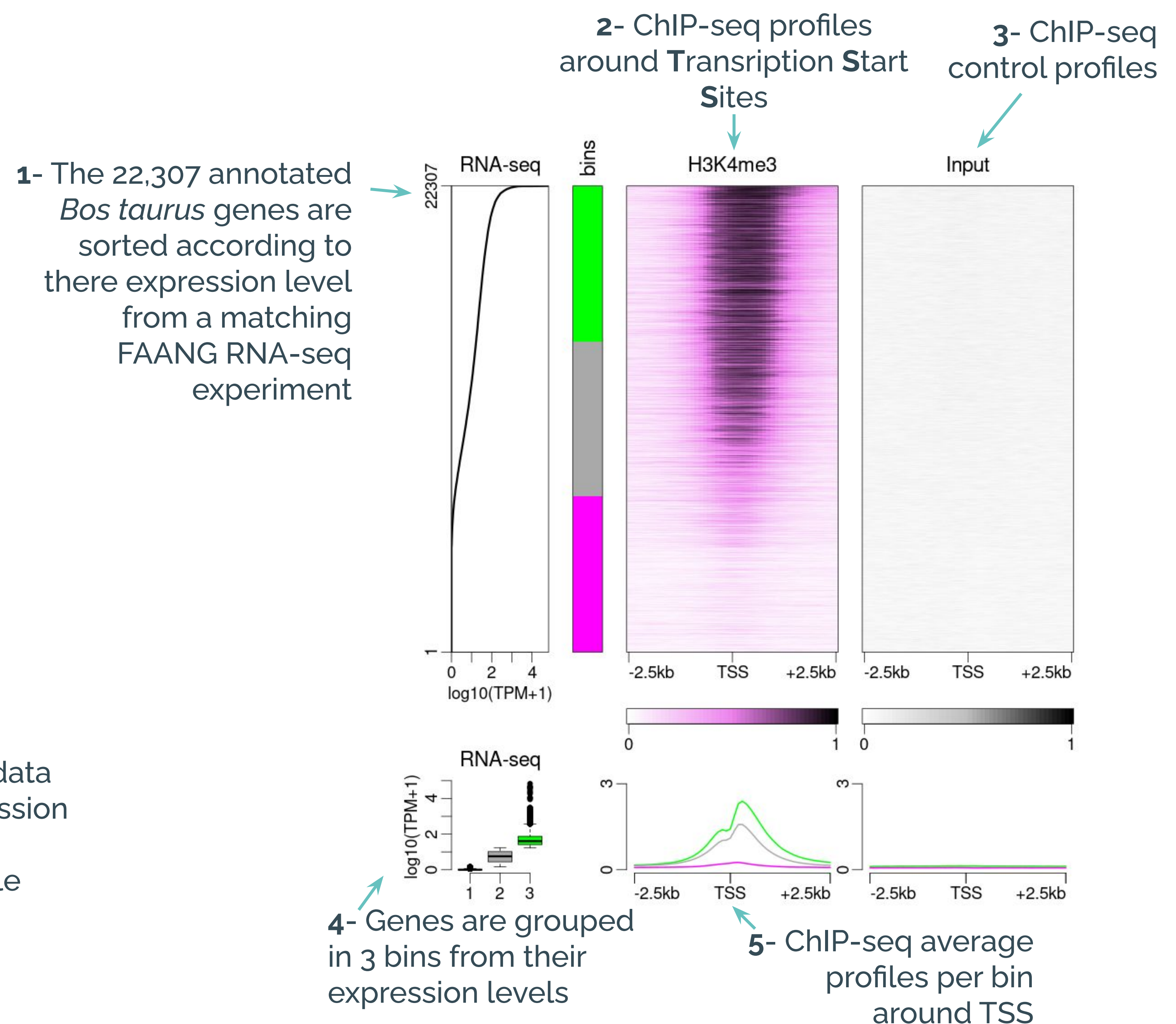
Generated using the R package Epistack:

> github.com/GenEpi-GenPhySE/epistack

Integrative analysis of RNA-seq and ChIP-seq / DNA methylation data:

- > data quality
- > exploratory analysis

H3K4me3 ChIP-seq from a cow cerebellum



VizFaDa timeline

2020-07	2021-01	2021-07	2022-01	2022-07
VizFaDa starts	All RNA-seq processed	Web-app (alpha)	All ChIP-seq processed	Web-app (beta)
			All DNA methylation processed	Web app (RC)

- Maintenance:
- > new FAANG data
 - > using new reference genomes and annotations

Web applications

Soon: a dedicated web-app for visualisations

Soon: integrations to the data.faang.org portal

Fundings

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