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► **To cite this version:**

Loïc Couderc, Erwan Gueguen, Maxime Brunin, Areski Flissi, Guillemette Marot, et al.. TnSeek : analysing Tn-seq data for multiple conditions and multiple species. Journ ees Ouvertes en Biologie, Informatique et Math ematiques (JOBIM 2022), Jul 2022, Rennes, France. hal-03827389

HAL Id: hal-03827389

<https://hal.science/hal-03827389v1>

Submitted on 24 Oct 2022

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TnSeek : analysing Tn-seq data for multiple conditions and multiple species

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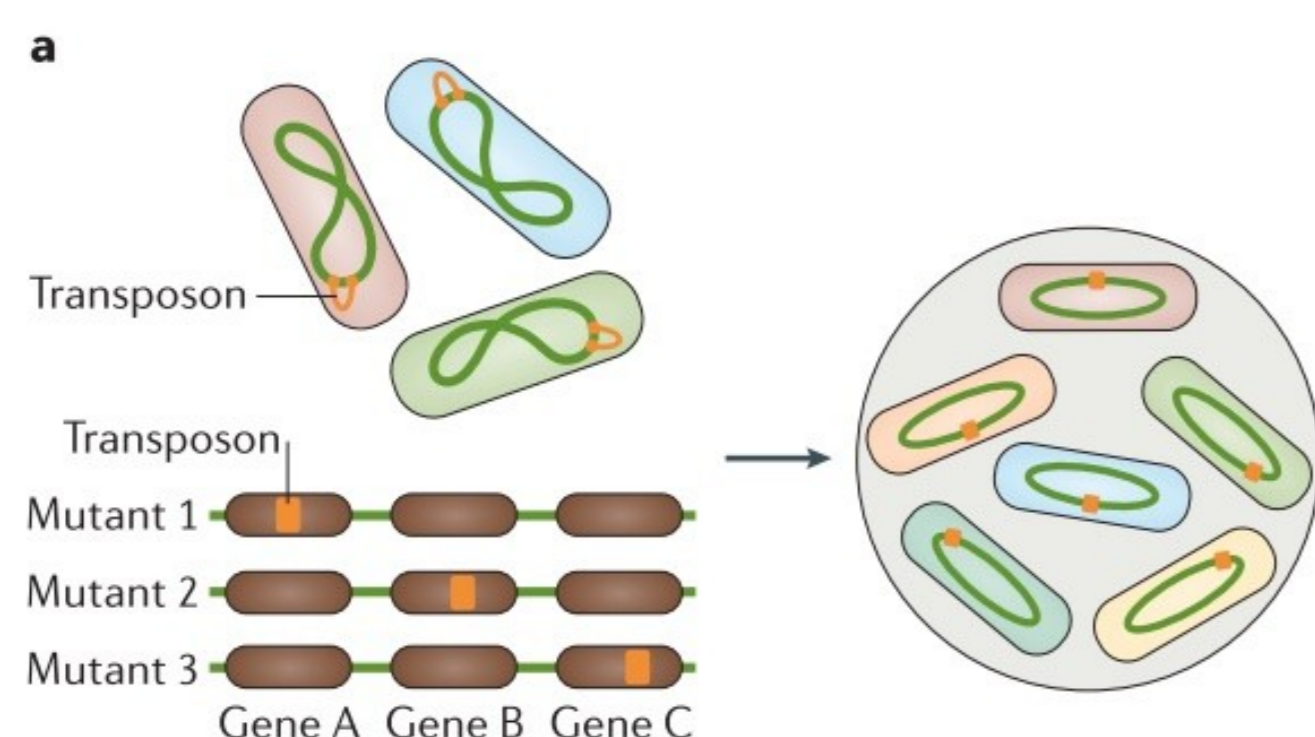
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Tn-seq → Transposon sequencing

Tn-seq is a genome-wide screening method that rapidly identifies, on a large panel of strains, genes related to a specific phenotype or growth condition in bacteria. It consists in random transposon mutagenesis in parallel coupled with high throughput sequencing.



Main steps

- creation of a pool of mutants by random insertion of a transposon
- growth (and selection)
- high-throughput sequencing of surviving cells

Essential genes

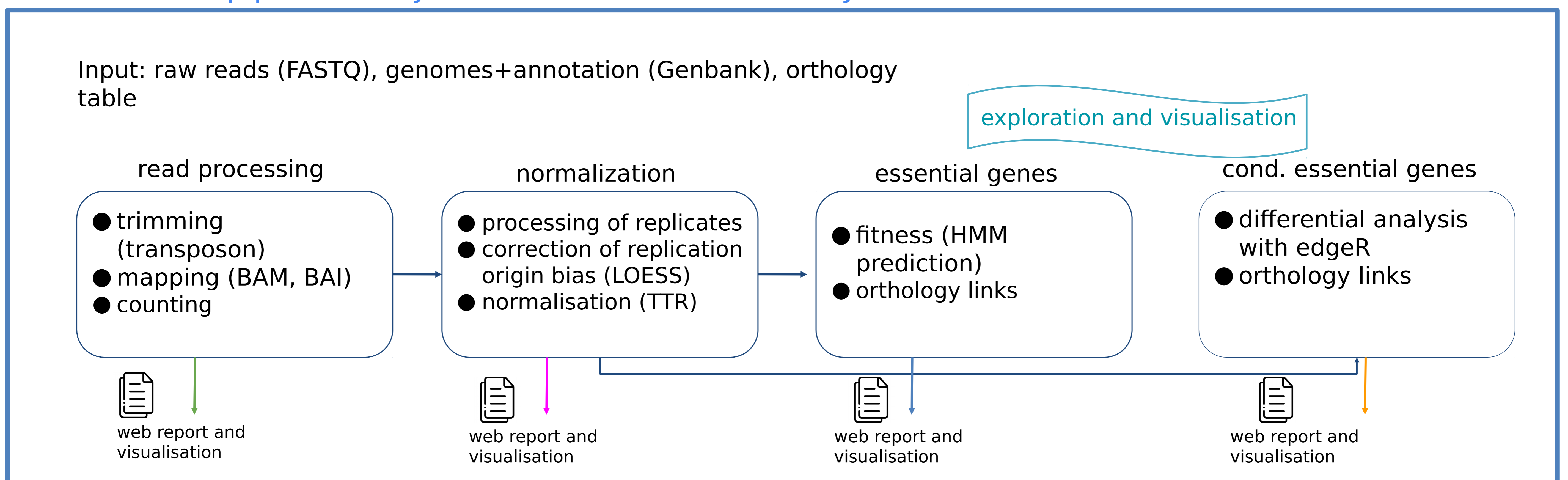
genes essential for growth under a given condition.

Conditionally essential genes

genes that are required for growth under one condition but not another

Example of applications: identification of virulence factors of pathogenic bacteria, identification of genes involved in antibioresistance, ...

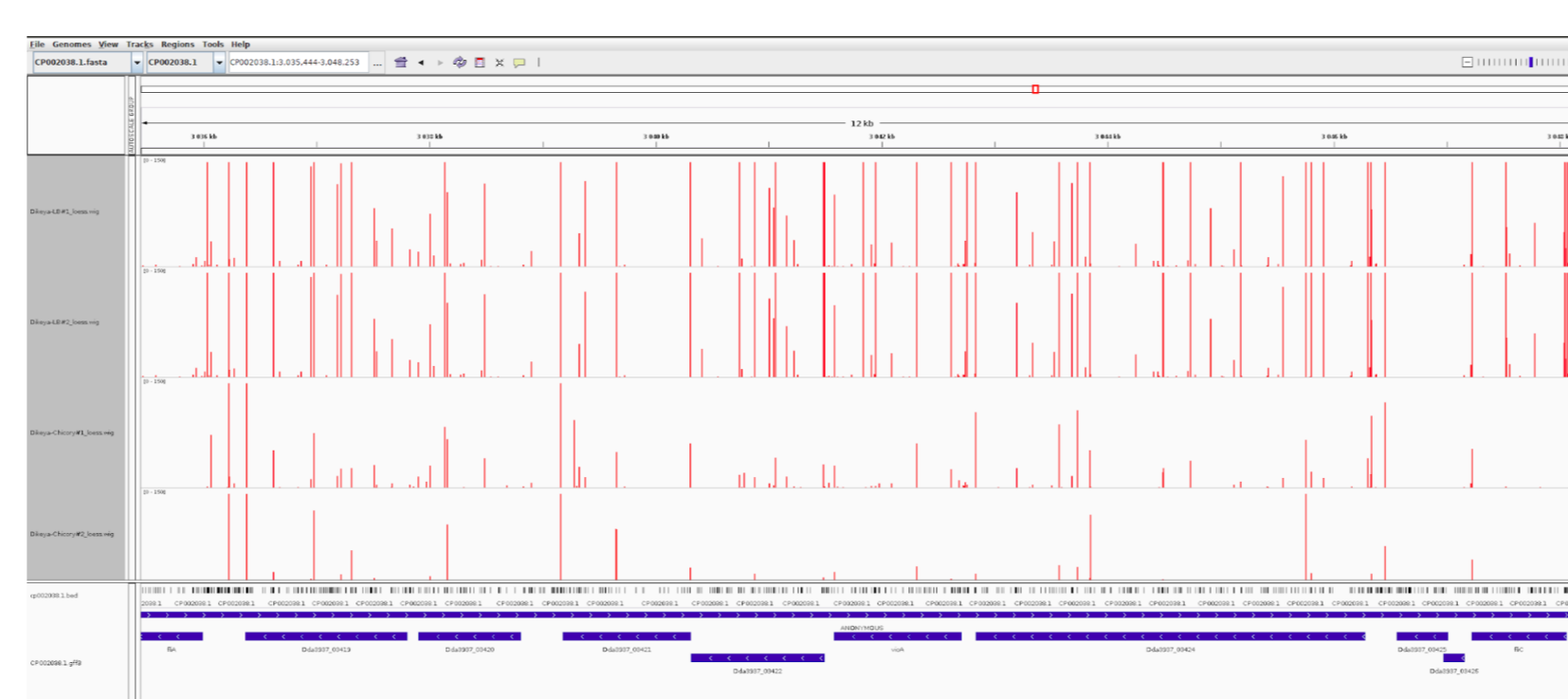
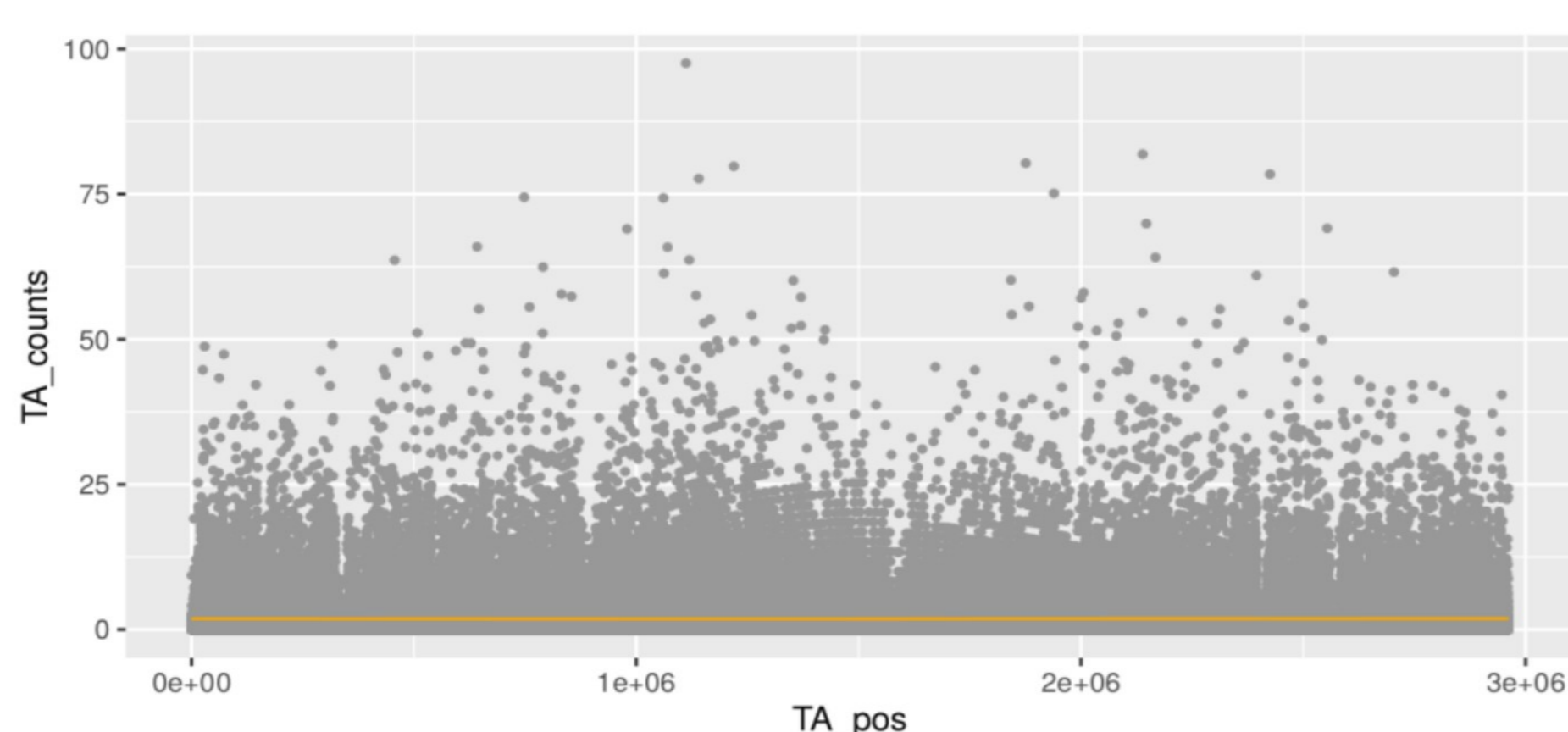
TnSeek → our pipeline, any number of conditions + any number of strains



TnSeek in practice → easy-to-install + easy-to-use

1. Download source at <https://gitlab.cristal.univ-lille.fr/bonsai/tNSEEK>
2. Build the Docker image and run it
3. Connect to the Shiny server at <http://localhost:3838>

implemented in Python and R
installation with docker
reports in R markdown
web application for exploration and visualization: R Shiny & SQLite



genus	strain	condition	genes	p-value	histogram	volcano	all conditions
Dickeya	Dickeya_dadantii_3937	water	tsv	graph	plot	tsv (Dickeya_dadantii_3937)	
Dickeya	Dickeya_dadantii_3937	planta	tsv	graph	plot	tsv (Dickeya_dadantii_3937)	
Dickeya	Dickeya_zeae_A586	water	tsv	graph	plot	tsv (Dickeya_zeae_A586)	
Dickeya	Dickeya_zeae_A586	planta	tsv	graph	plot	tsv (Dickeya_zeae_A586)	
Pectobacterium	Pectobacterium_aquaticum_A212	water	tsv	graph	plot	tsv (Pectobacterium_aquaticum_A212)	
Pectobacterium	Pectobacterium_aquaticum_A212	planta	tsv	graph	plot	tsv (Pectobacterium_aquaticum_A212)	
Danthoniartarum	Danthoniartarum_varensilia_479	wester	tsv	graph	plot	tsv (Danthoniartarum_varensilia_479)	

