ChIP-seq: NRF1

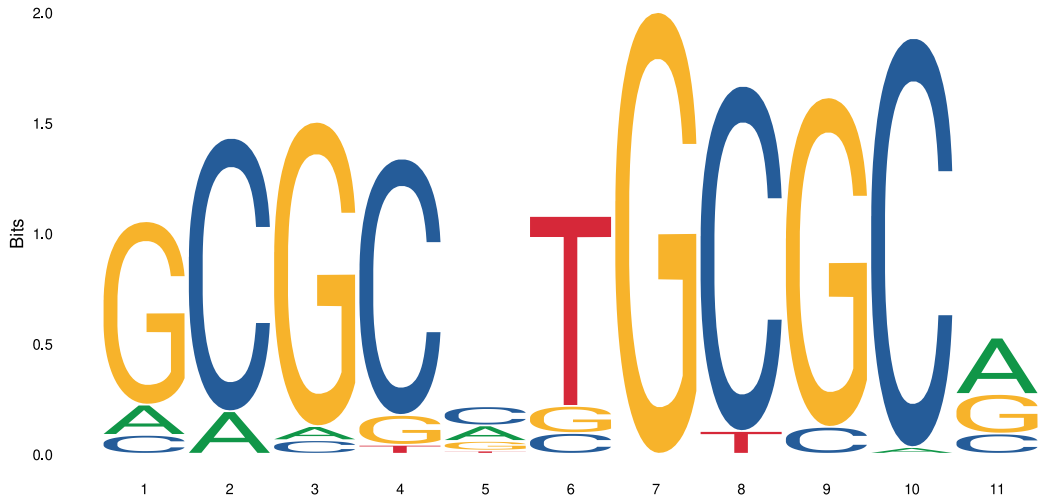
Sasso Elena

NRF1: background

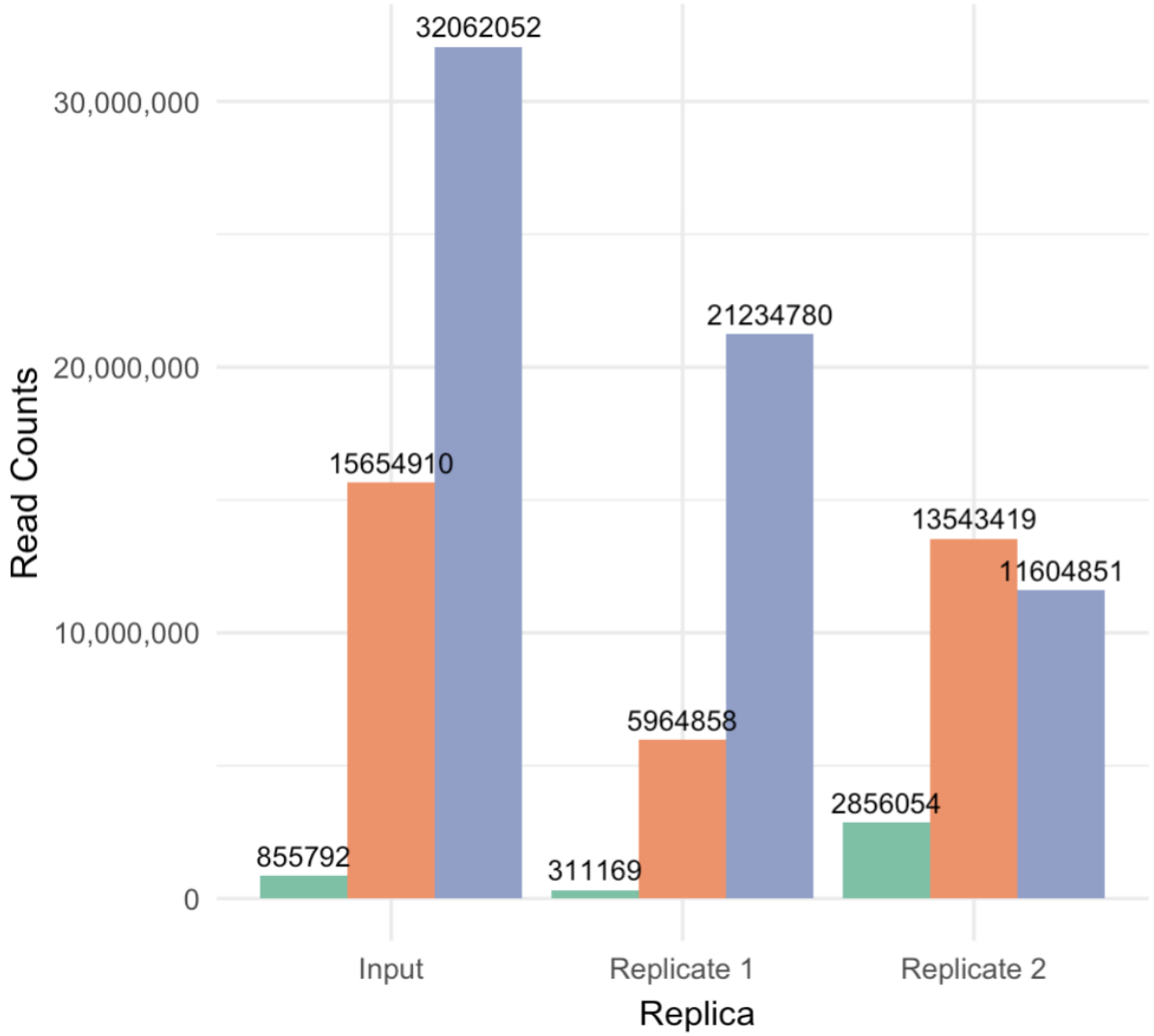
- Homo sapiens **nuclear respiratory factor 1**

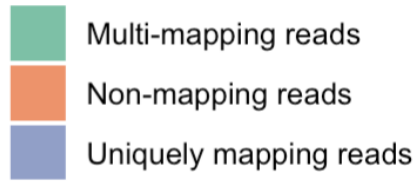
- Class: **Basic leucine zipper** factors (bZIP)
- Family: **Jun-related**

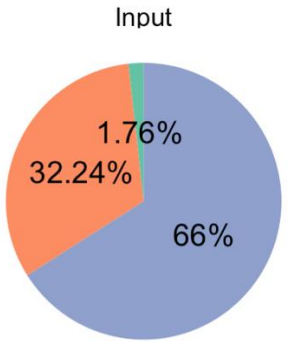
- It activates the expression of key metabolic genes that regulate **cell growth, respiration, heme biosynthesis, and mitochondrial DNA transcription and replication**

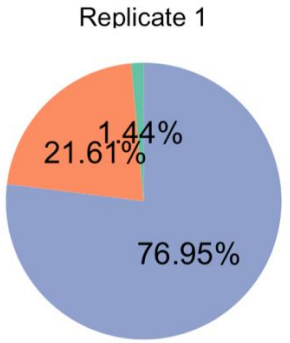


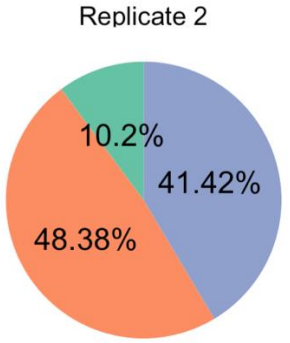
Preliminary mapping and quality control











Peak calling

	Replicate 1	Replicate 2	Merged
# peaks	5203	3959	6024
# peaks after removing blacklisted regions	5191	3484	5729
Redundant rate (in treatment)	0.09	0.07	0.09
Fragment size (d)	91	98	93

Peak caller used: MACS2 with all default parameters

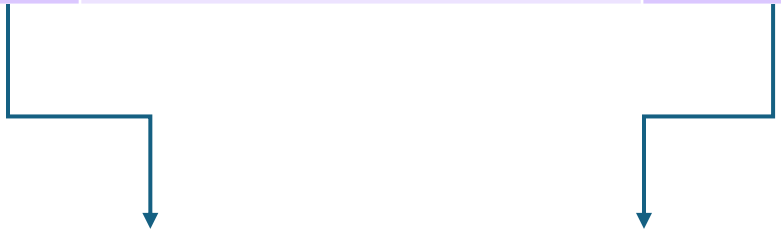
Peak calling: overlaps

	Replicate 1	Replicate 2	Merged
# peaks	5203	3959	6024
# peaks after removing blacklisted regions	5191	3484	5729

Simple overlap	Summit proximity
3042 **(87%)**	2979 **(85%)**

Peak calling: overlaps

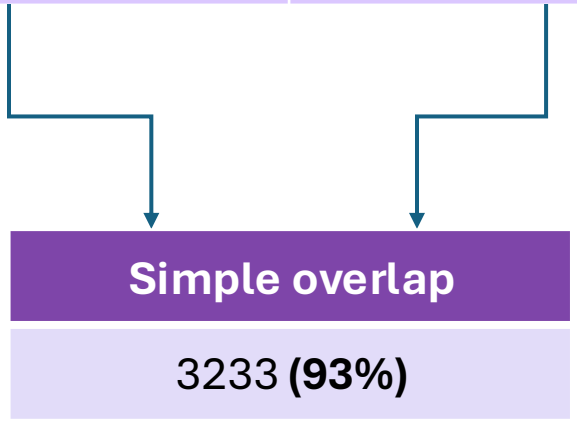
	Replicate 1	Replicate 2	Merged
# peaks	5203	3959	6024
# peaks after removing blacklisted regions	5191	3484	5729



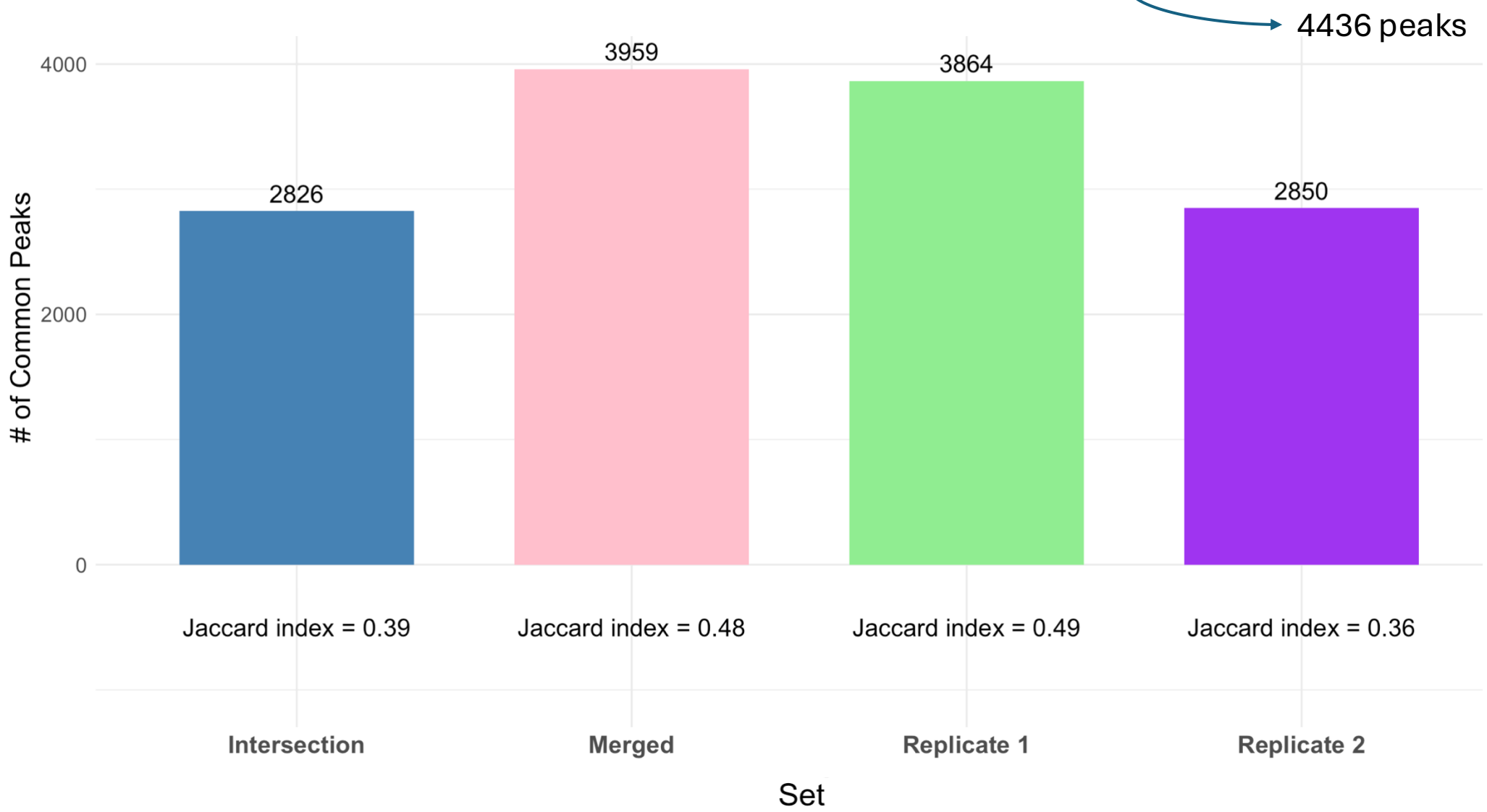
Simple overlap
5012 **(96%)**

Peak calling: overlaps

	Replicate 1	Replicate 2	Merged
# peaks	5203	3959	6024
# peaks after removing blacklisted regions	5191	3484	5729

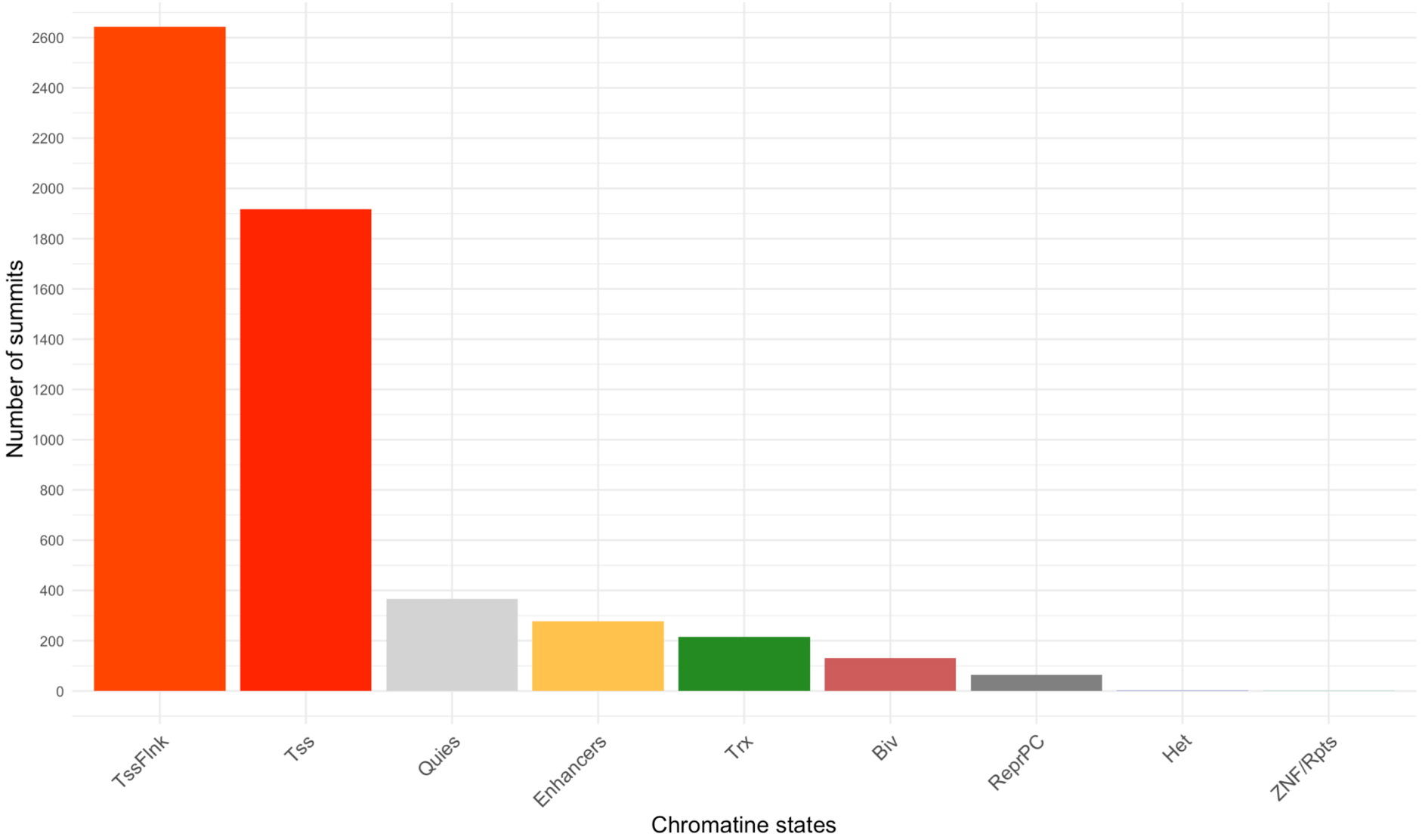


Comparison with ENCODE

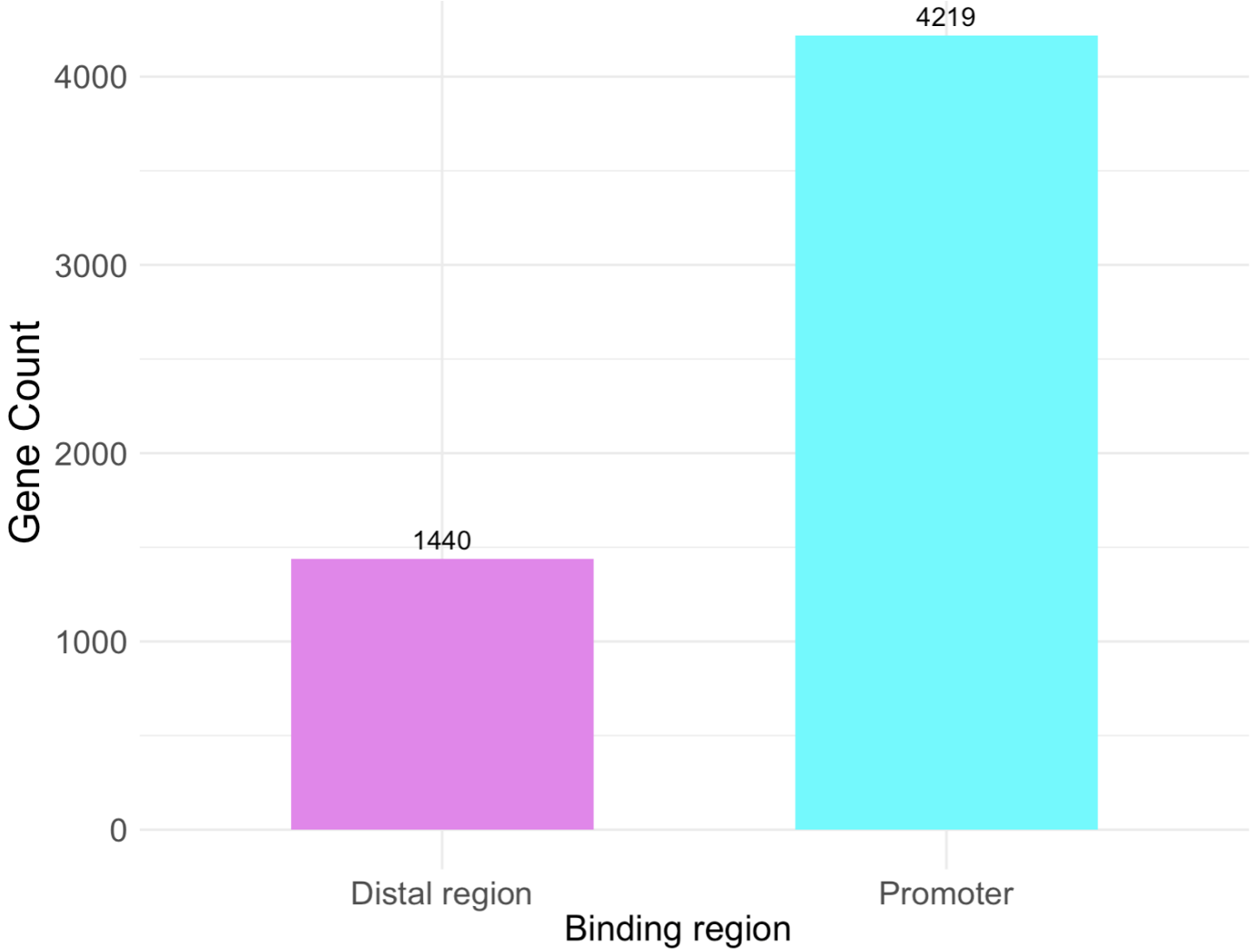


Comparison with ENCODE

Chromatine states



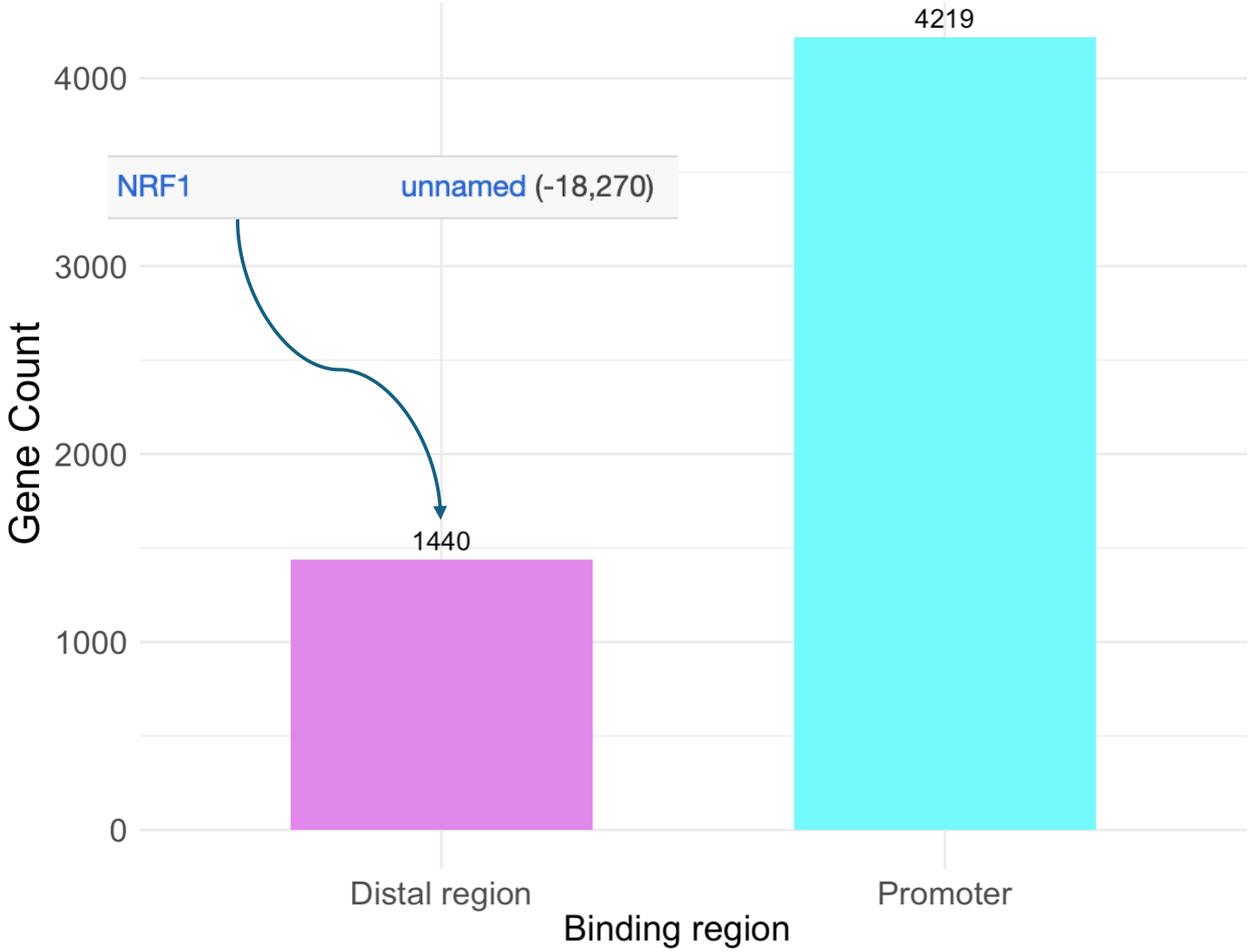
GREAT



Promoters : max ± 1 Kb from TSS

Distal region : max ± 30 Kb from TSS

GREAT

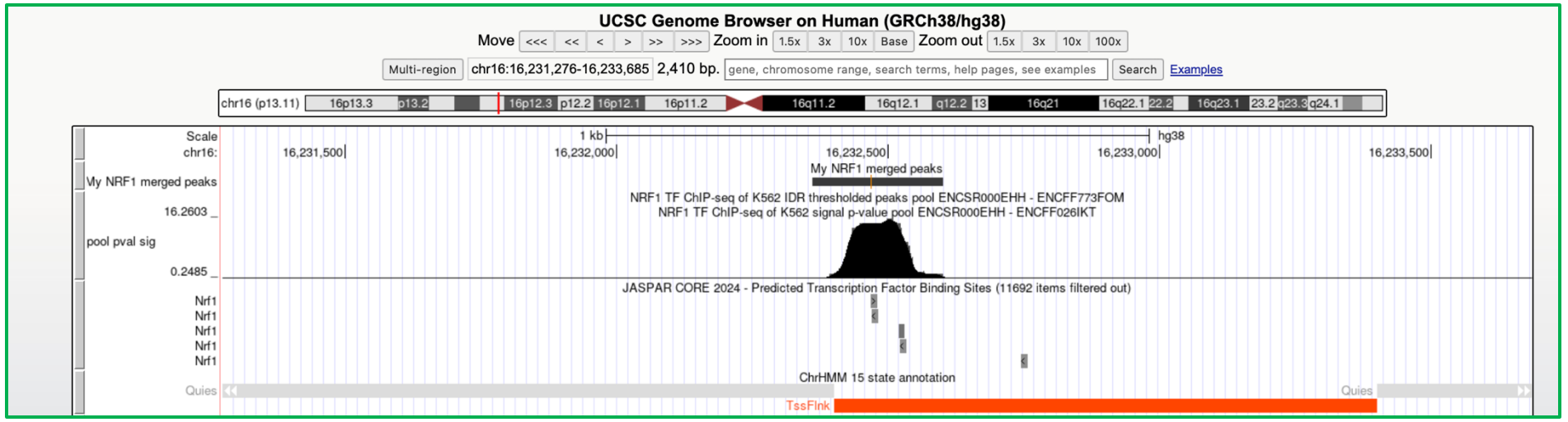


Promoters : max ± 1 Kb from TSS

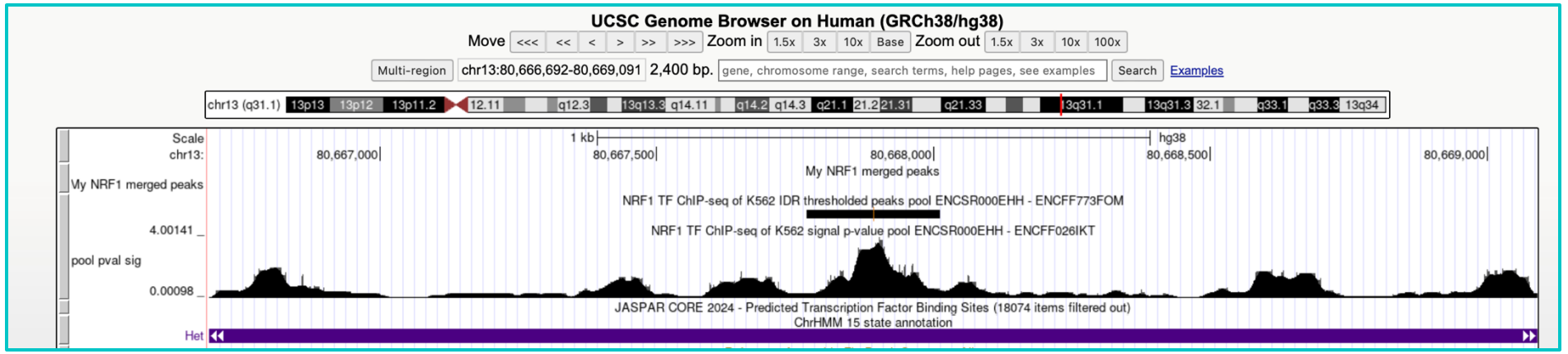
Distal region : max ± 30 Kb from TSS

Visualization 1

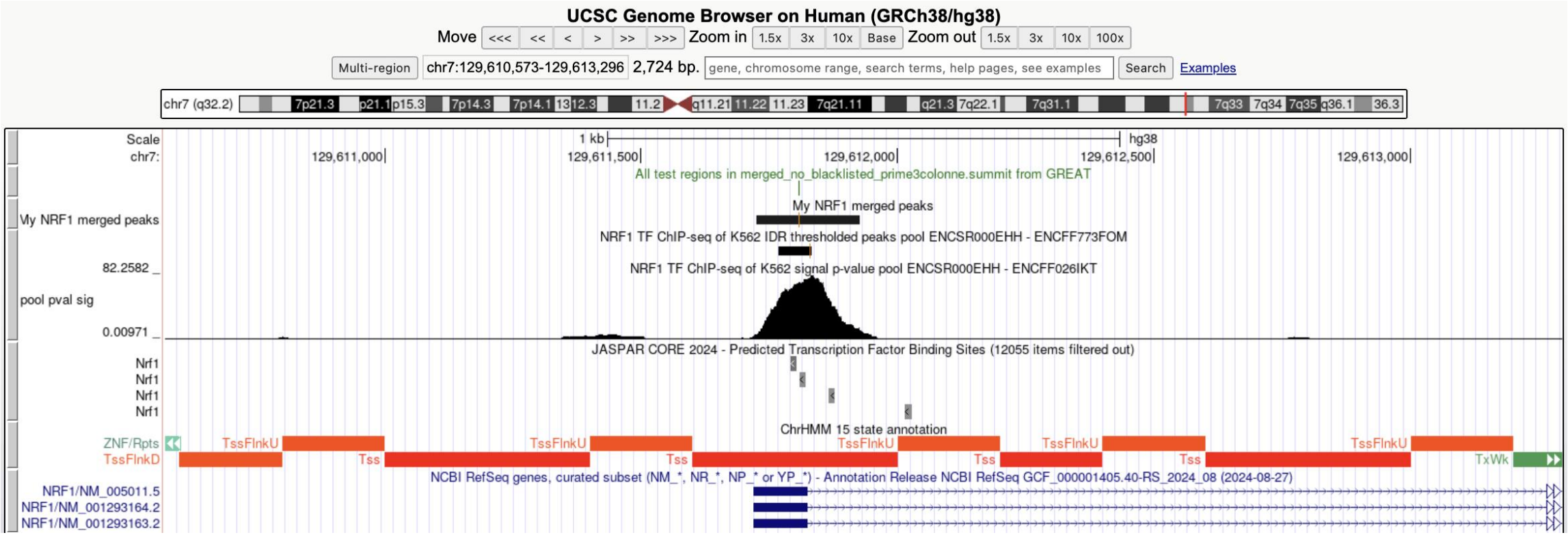
Only by me



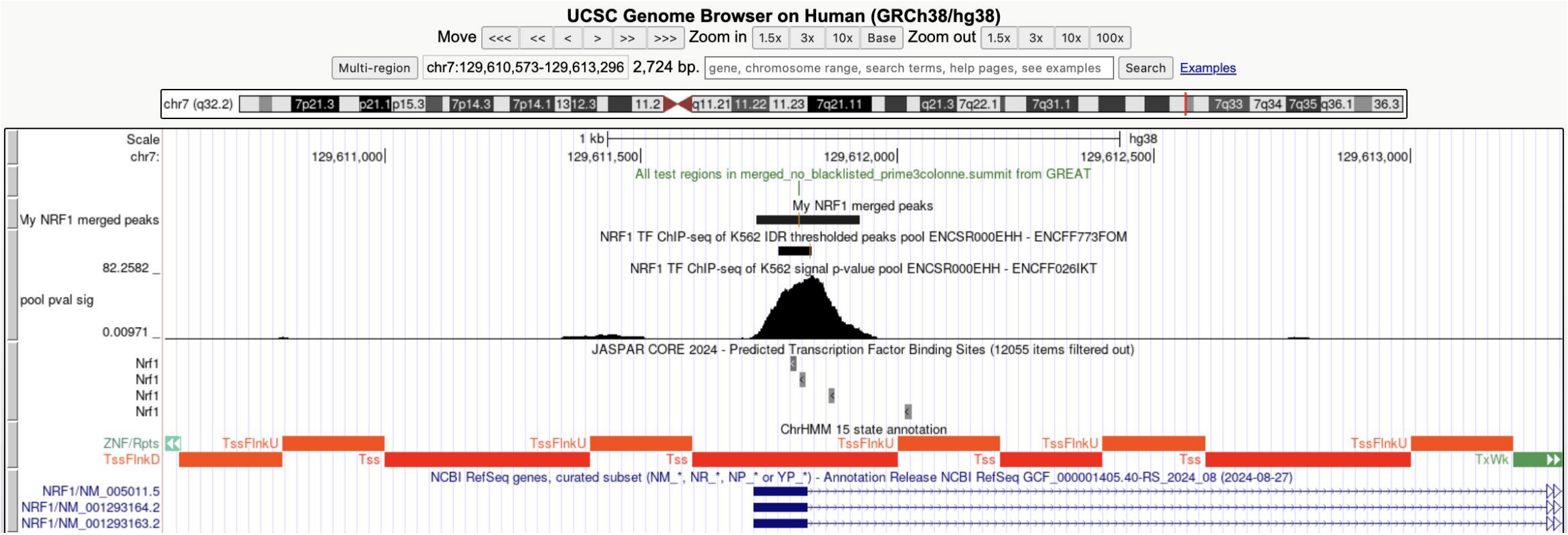
Only by ENCODE



Visualization 2: my TF regulates itself

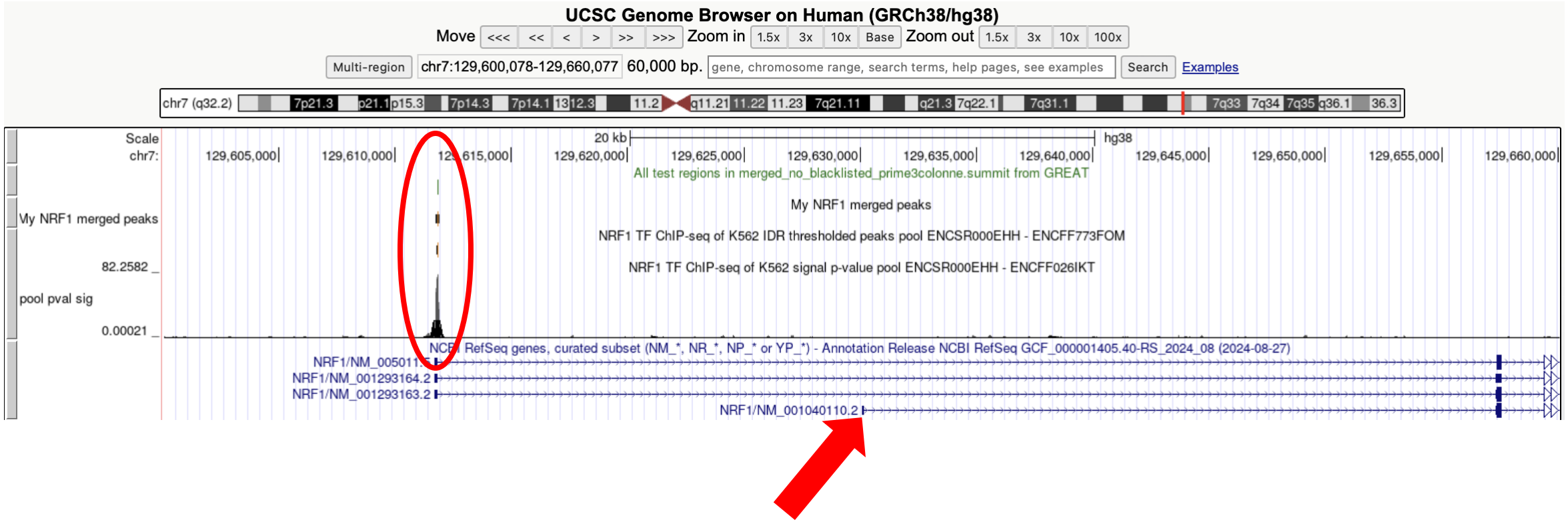


Visualization 2: my TF regulates itself



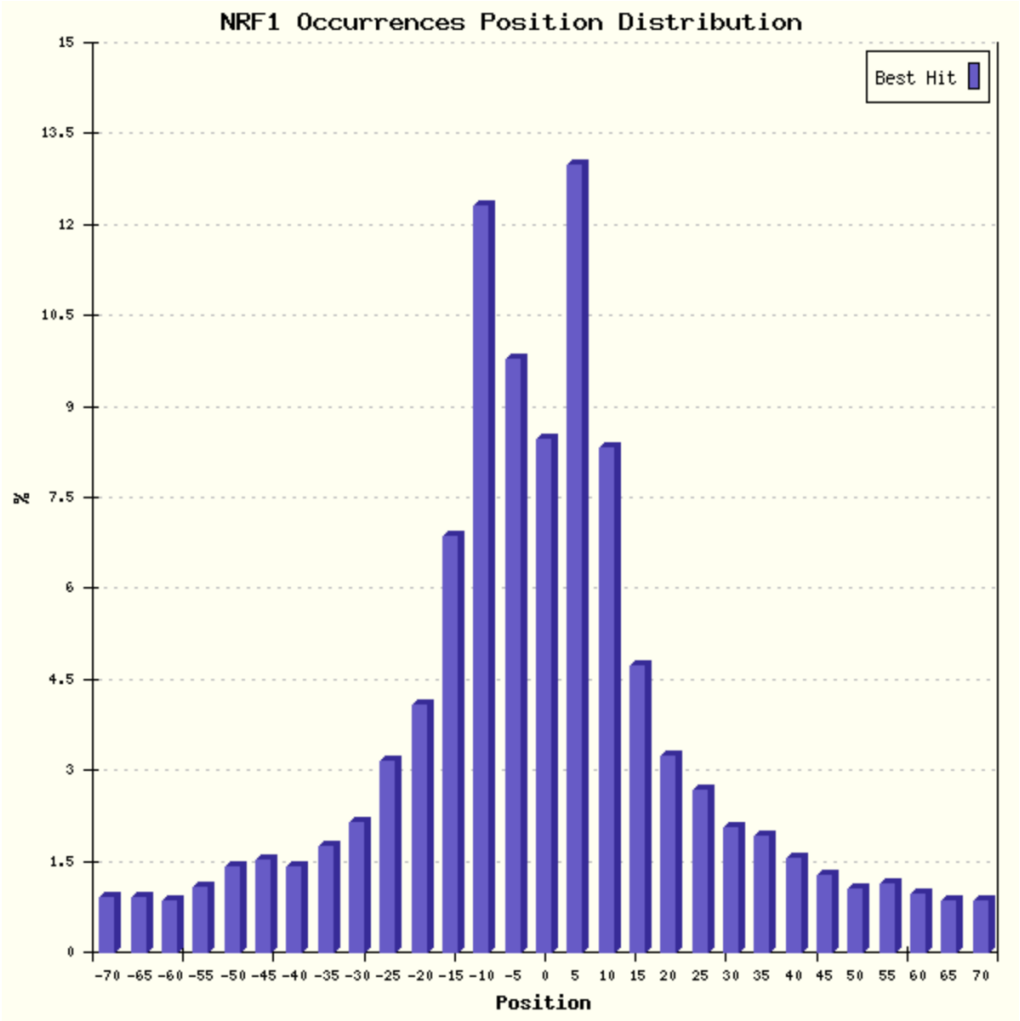
GREAT: NRF1 unnamed (-18,270) ?

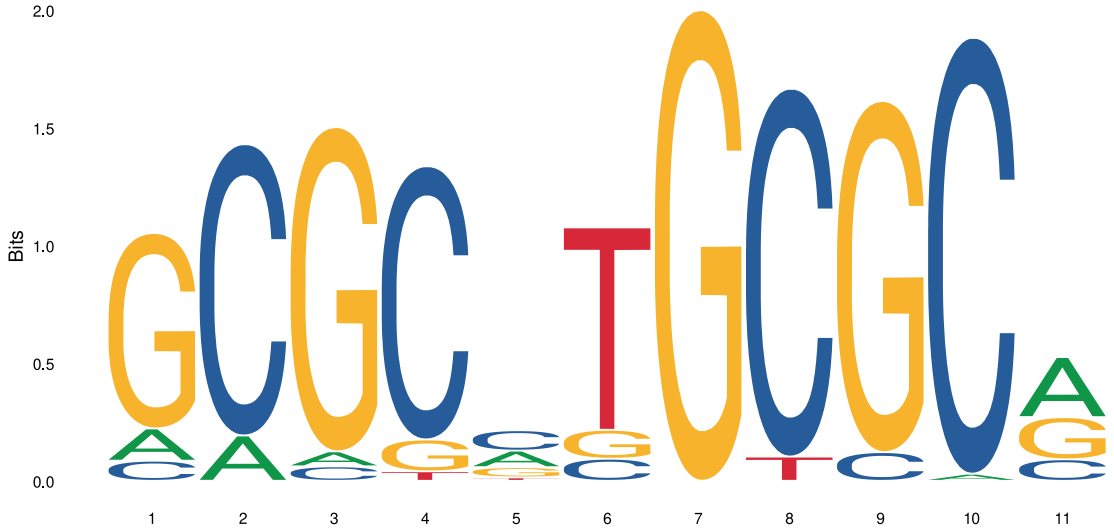
Visualization 2: my TF regulates itself



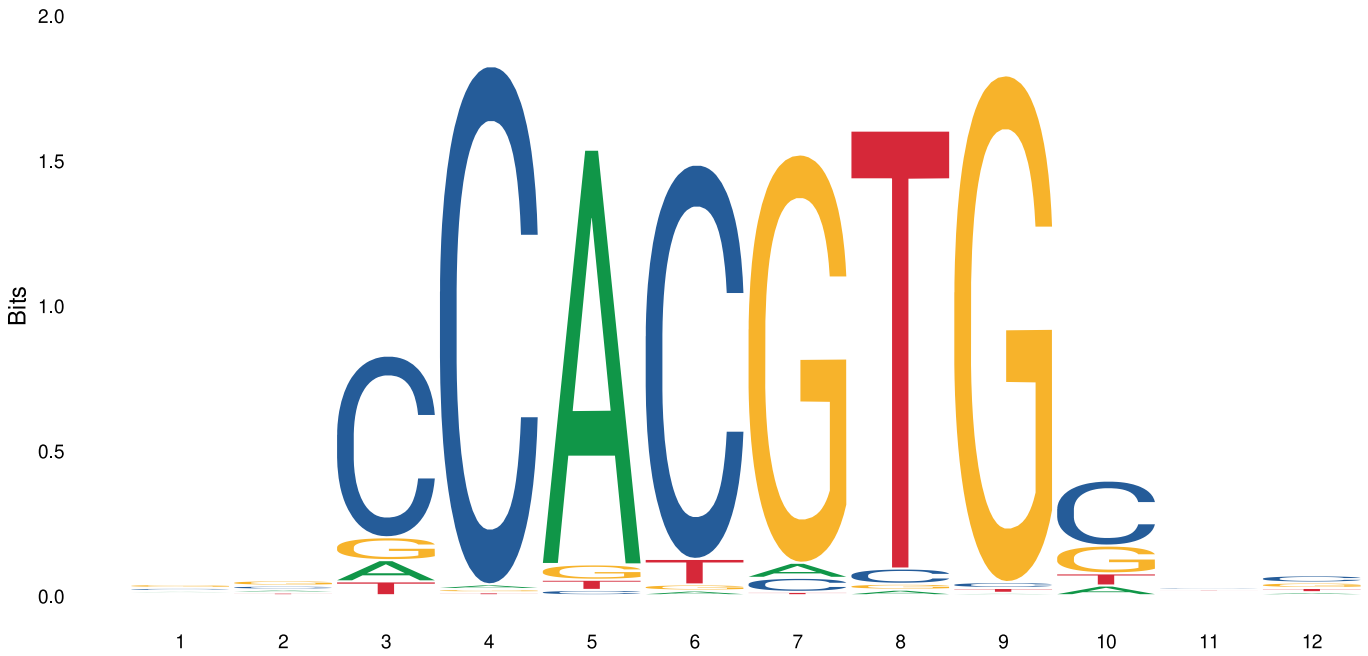
NRF1 unnamed (-18,270)

PscanChIP: NRF1





PscanChIP: interaction with MYC



- **MYC** regulates key processes such as cell proliferation, growth and differentiation.
- The interaction is well-known in **cancer biology**, where NRF1 and MYC collaborate to regulate genes involved in proliferation, self-renewal, and apoptosis resistance, driving tumor progression and metabolic reprogramming.


Thanks for the attention!