



# Navigating the ENCODE Encyclopedia: Exploring Candidate Regulatory Elements, Linked Genes, and Genetic Variation with SCREEN



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# Part II – Overview of The Registry of Candidate Regulatory Elements

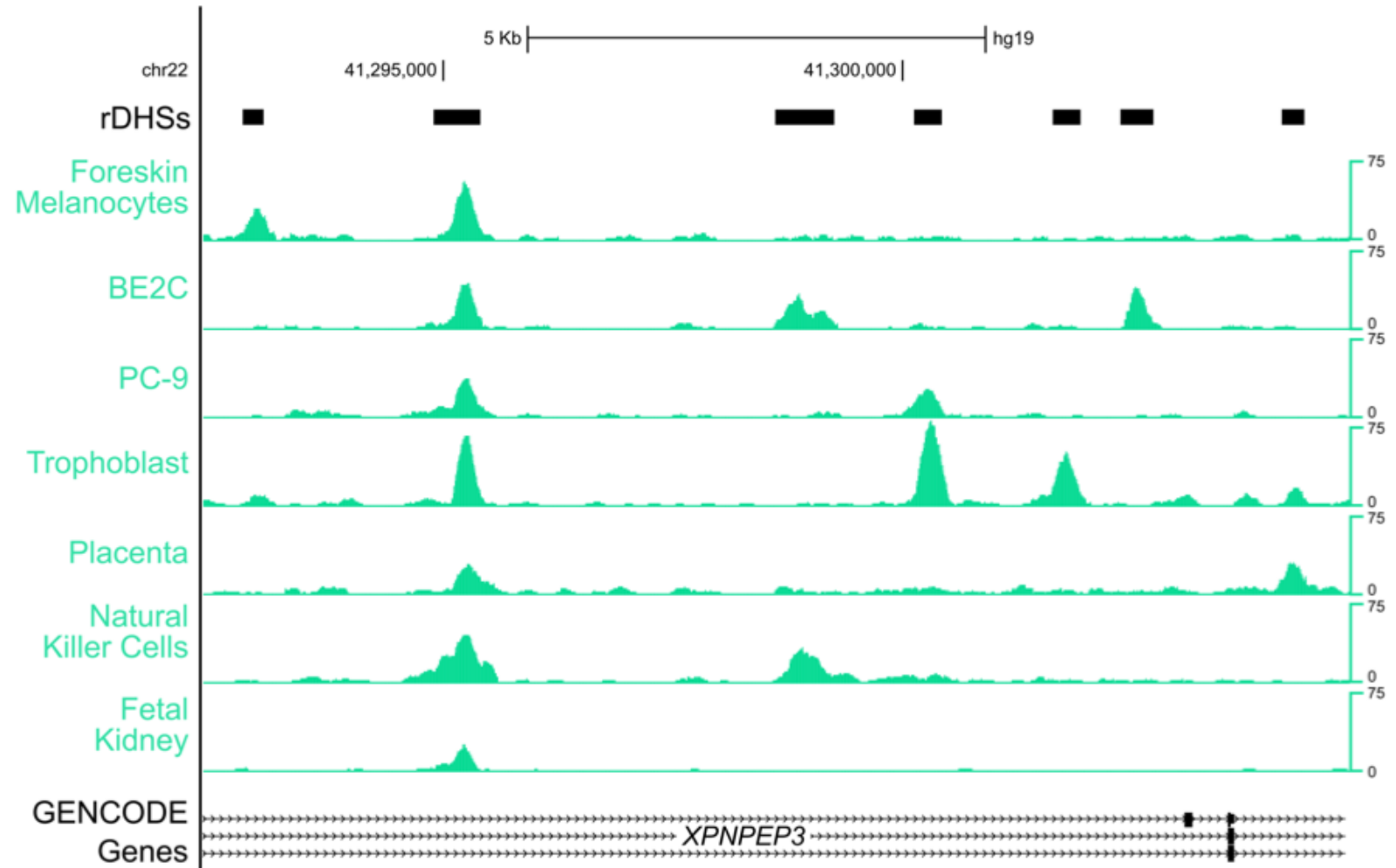
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## ENCODE Registry of candidate Regulatory Elements (cREs)

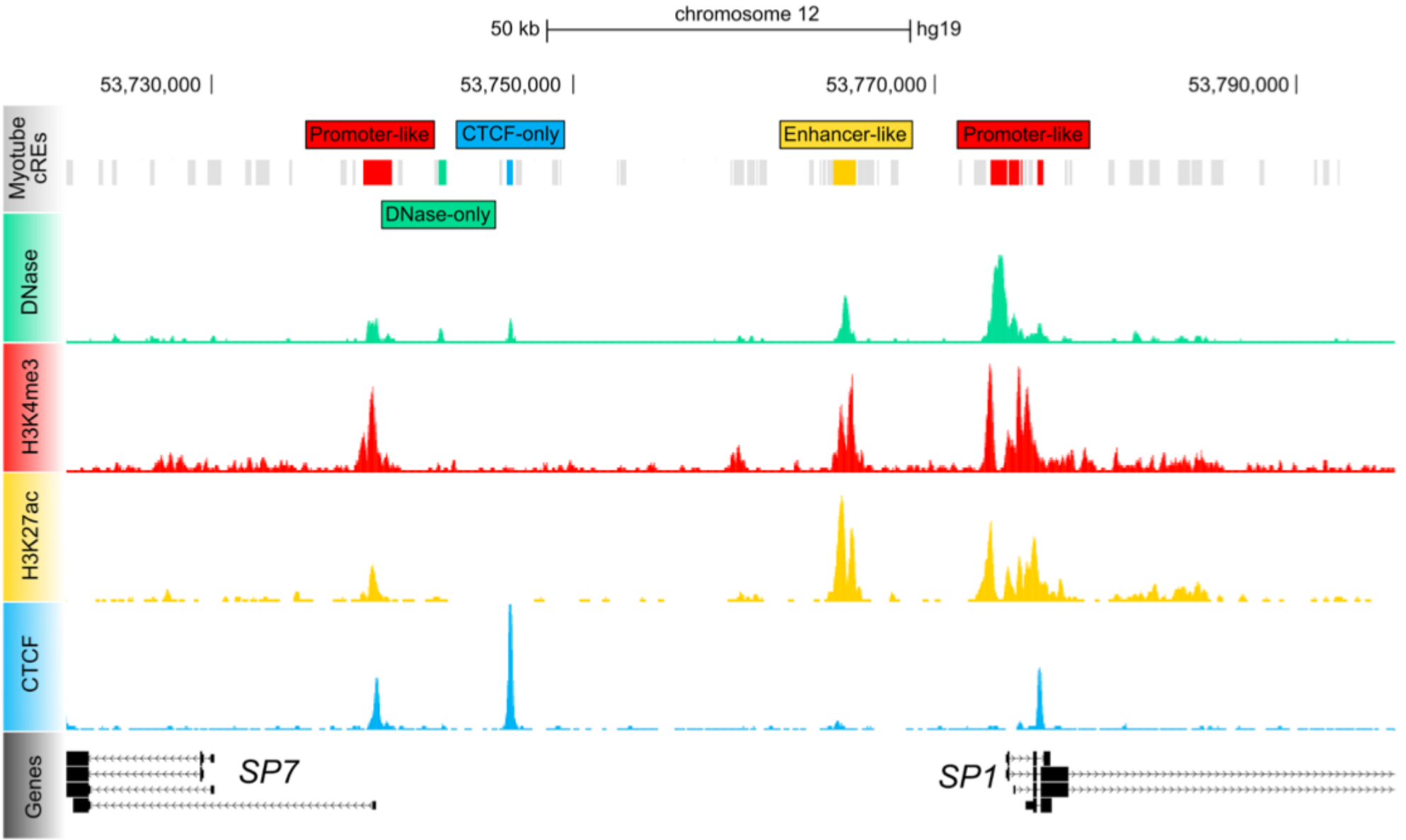
- Genomic regions that may function as regulatory elements including promoters, enhancers, and insulators
- Incorporate data from hundreds of cell and tissue types
- Creating registries in both human and mouse

# Step 1 – Creating representative DHSs (rDHSs)

- We generate DHS clusters using DHSs across over 400 cell types
- For each cluster we select a representative DHS (rDHS)
- We iteratively run this procedure until all DHSs are represented



# Step 2 – Annotating rDHSs with Histone & CTCF ChIP-seq Signal



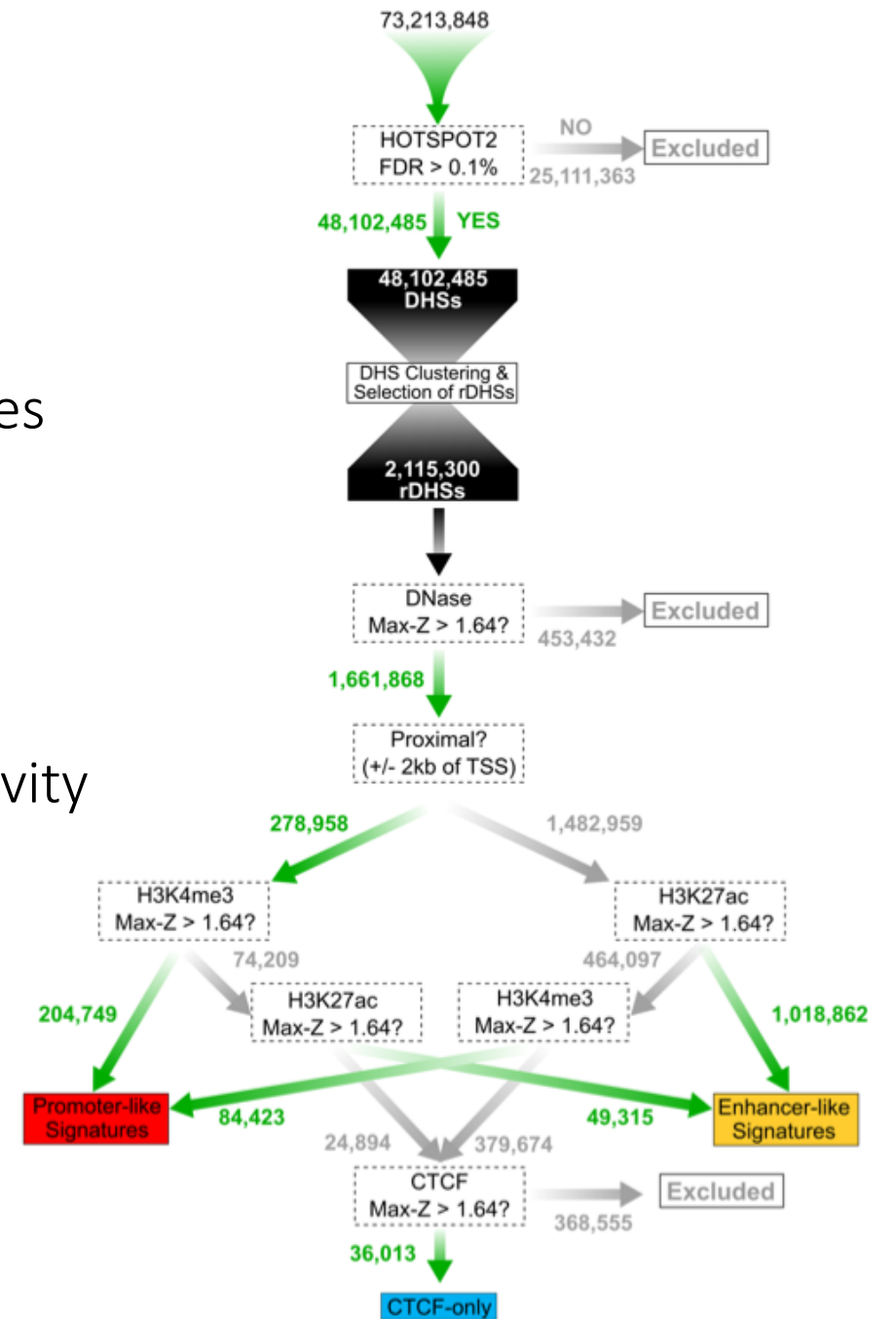
# Two Types of Classification Schemes:

## 1. Cell type agnostic:

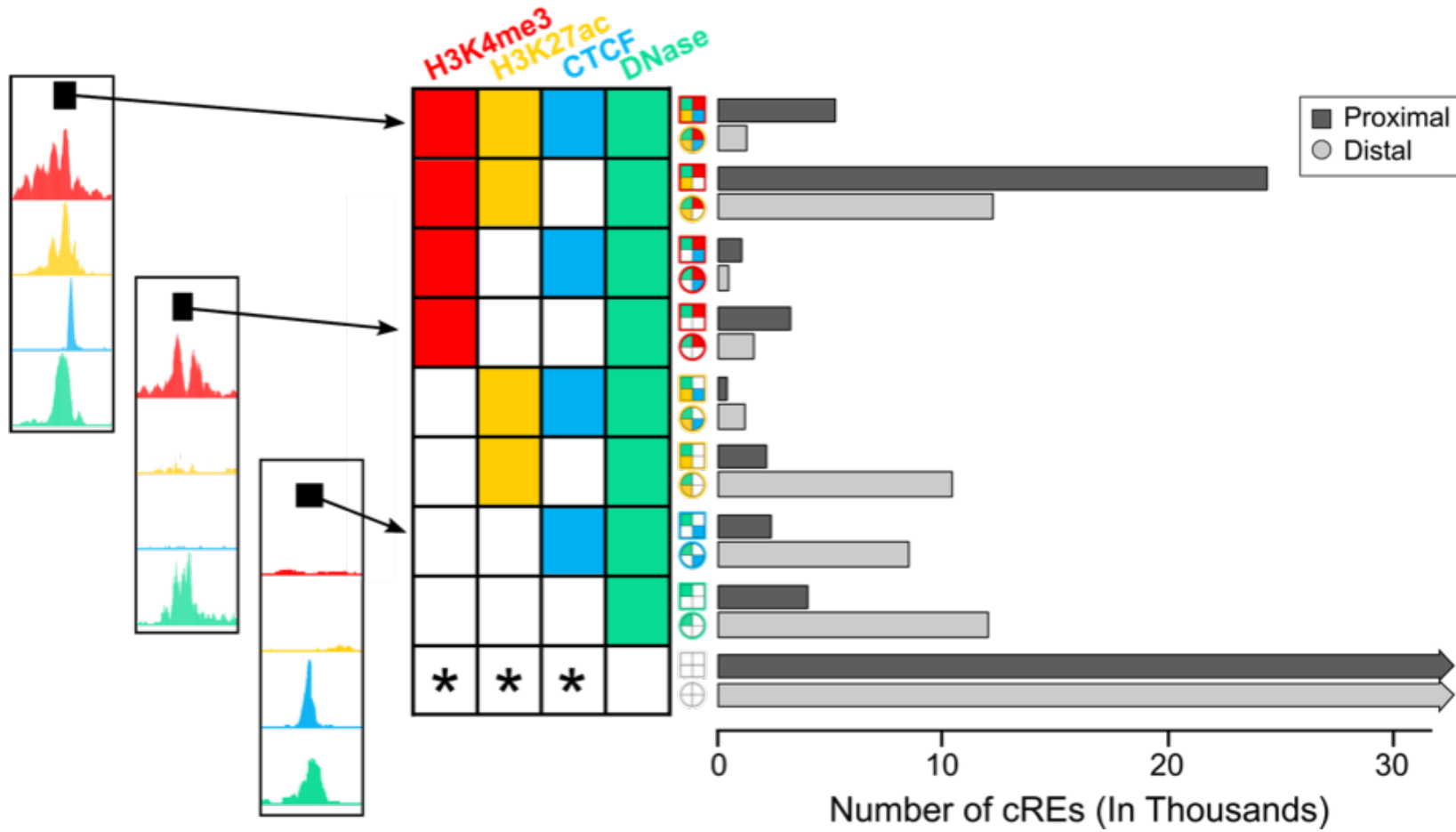
- Independent of cell type
- Use maximum ChIP-seq signal across all cell types and distance from TSS

## 2. Cell type specific:

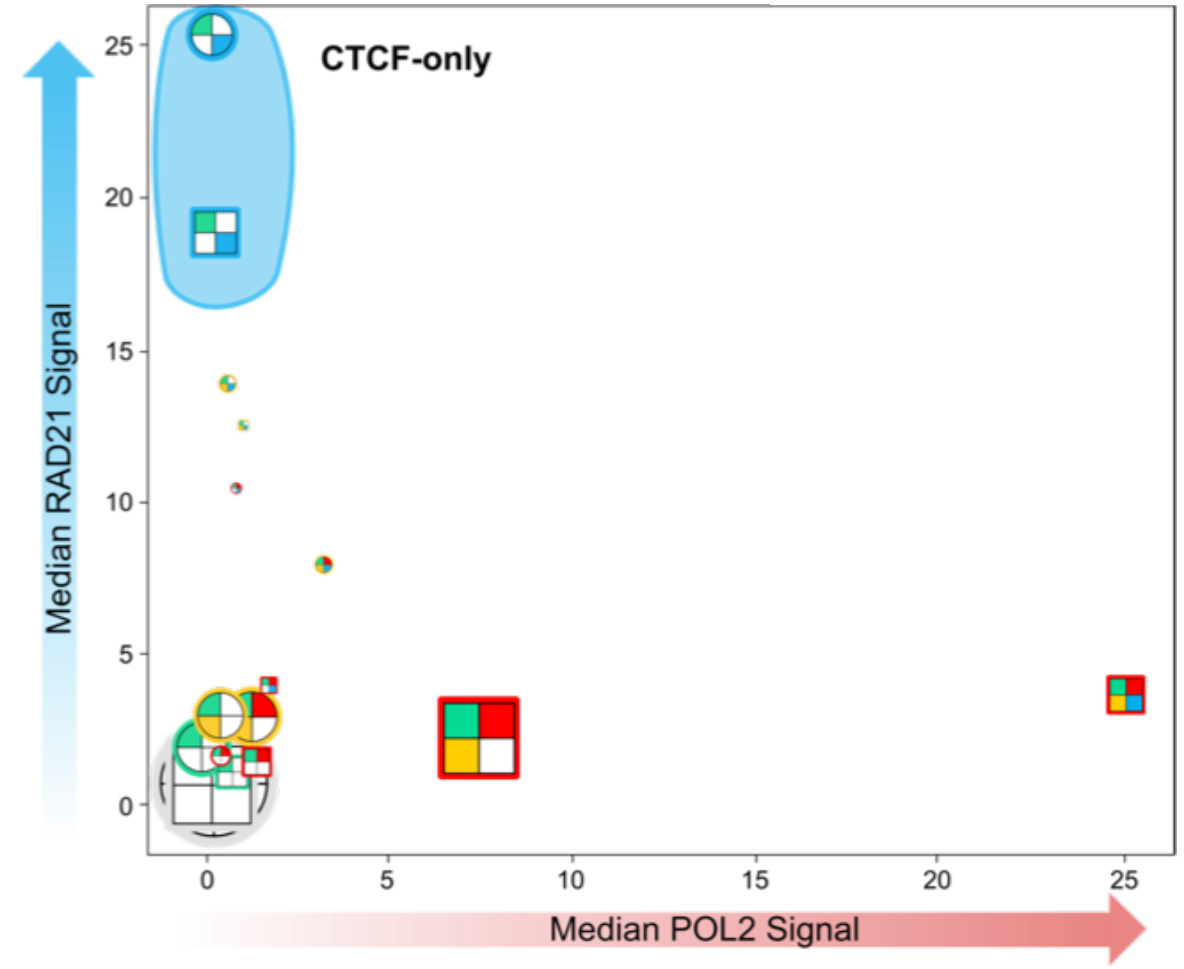
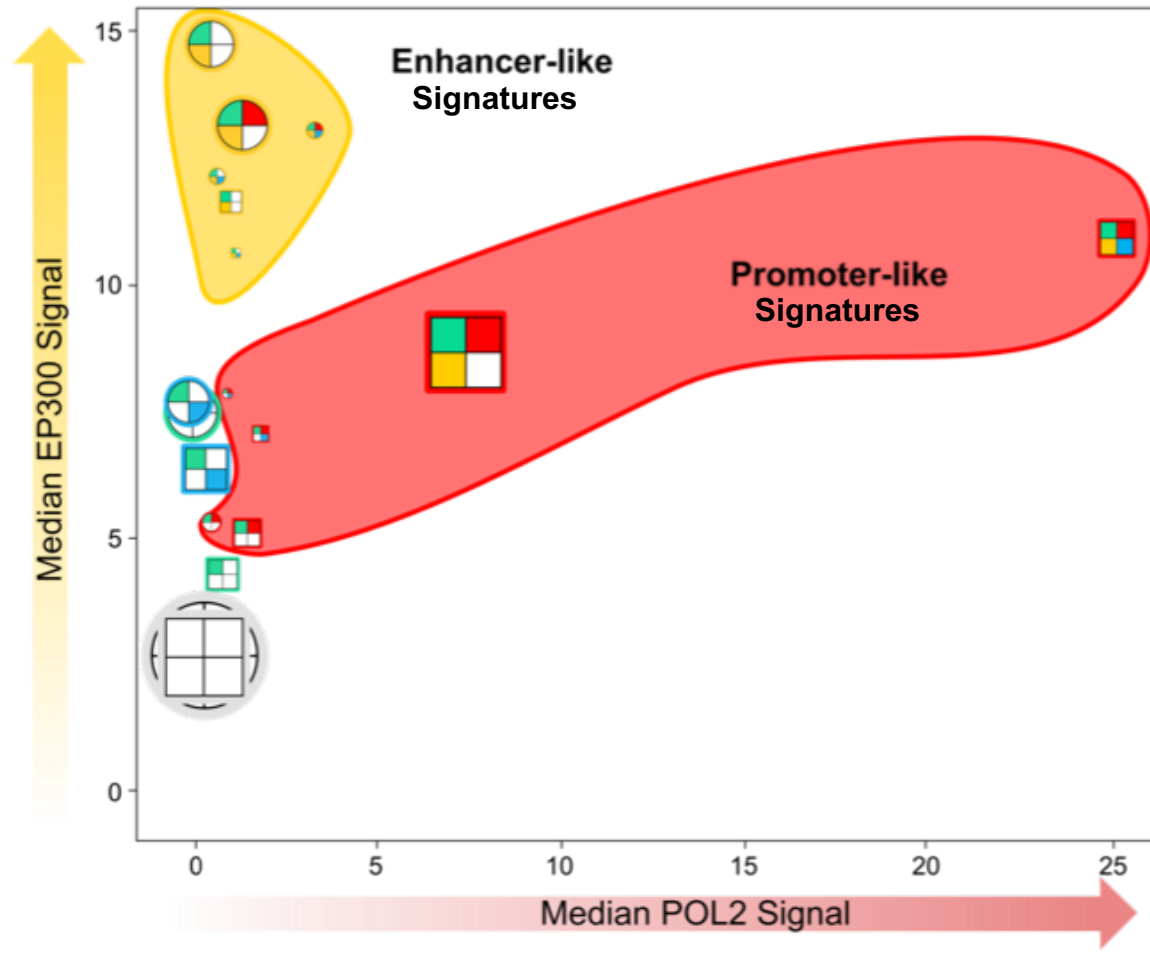
- Use cell-type specific signal to annotate the activity of each cRE in over 600 cell types



# Cell Type Specific Classification

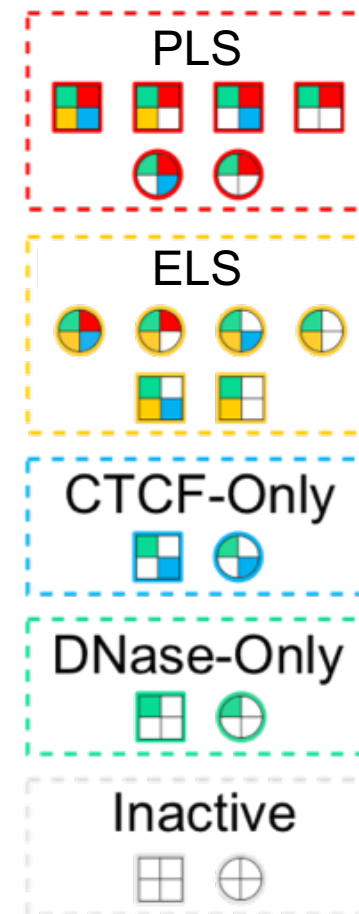
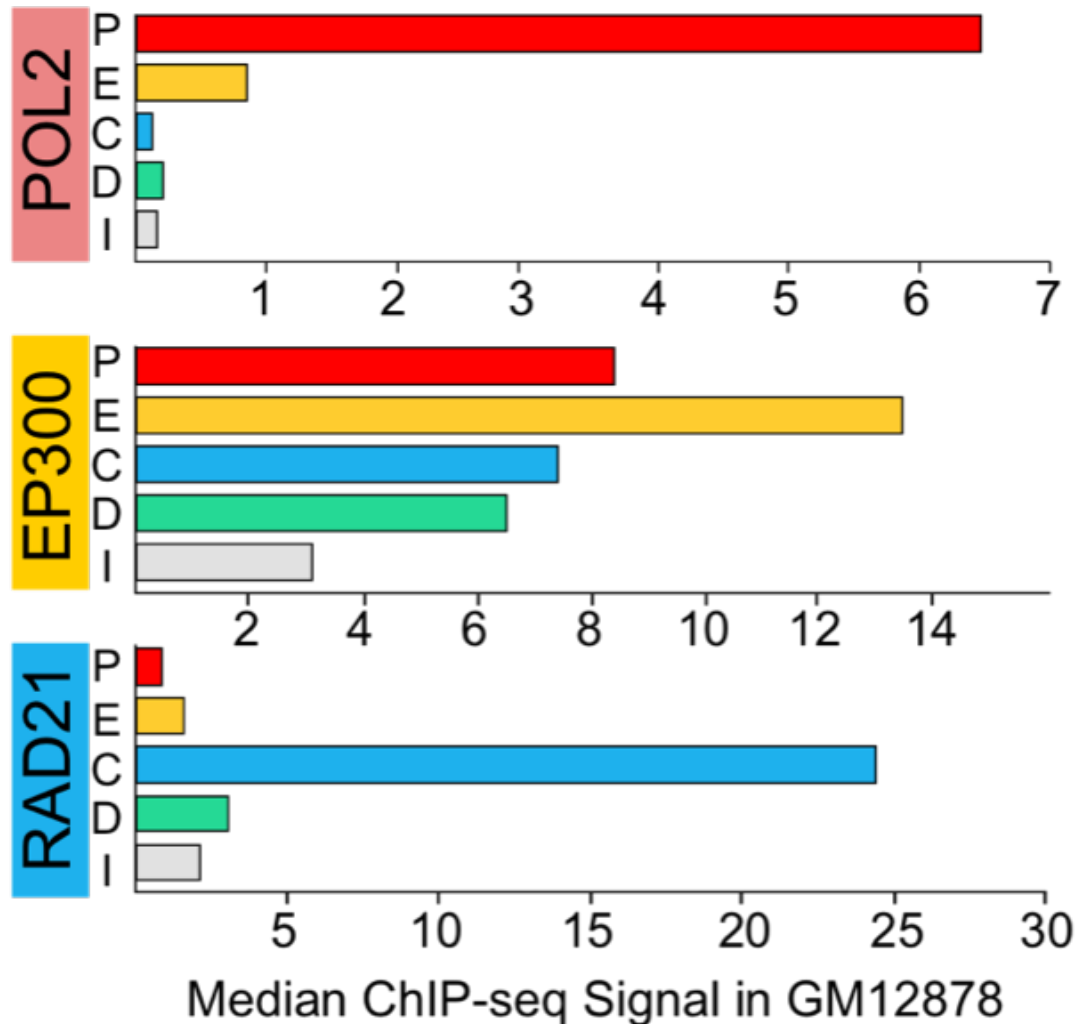


# Validation using Pol II, EP300, and RAD21 TF ChIP-seq Signal





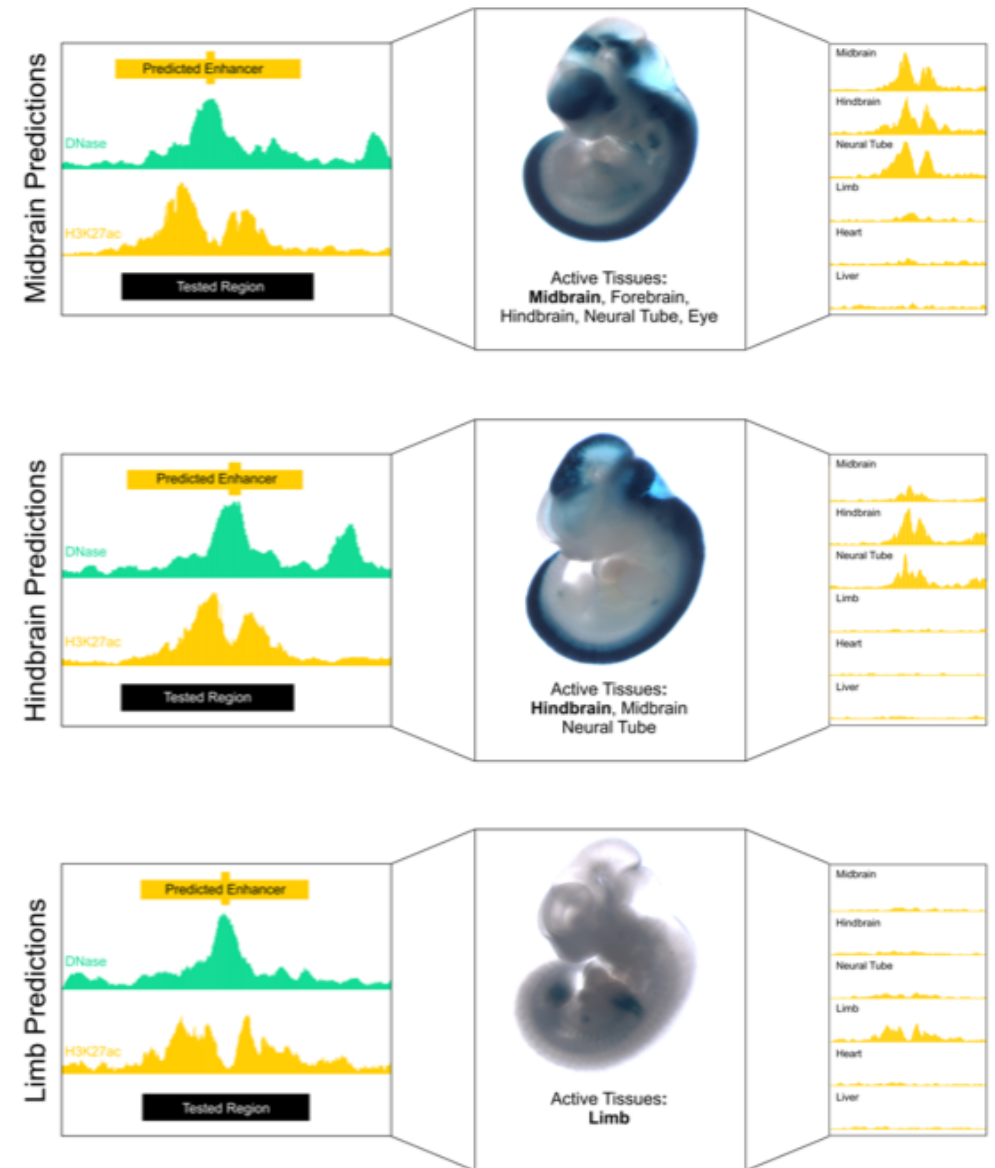
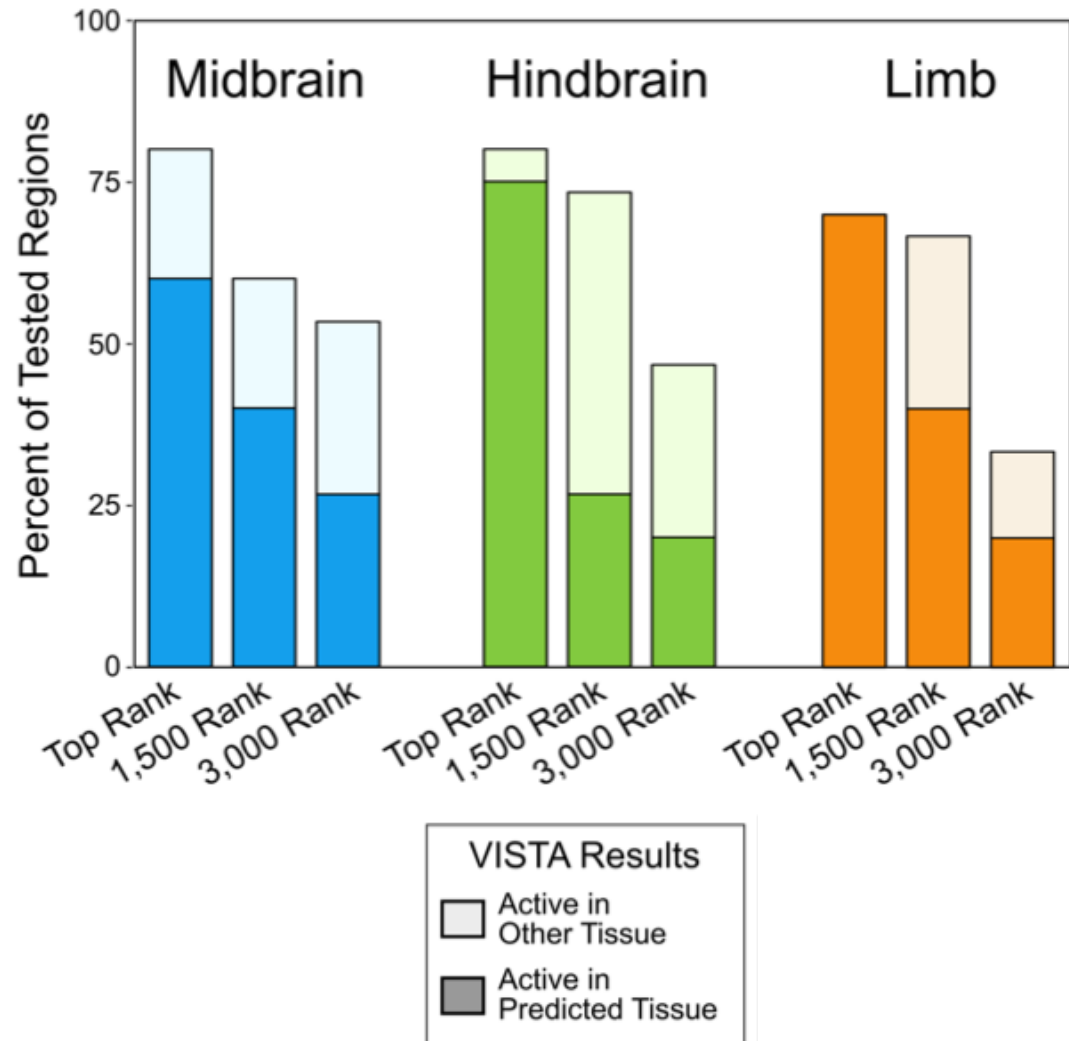
# Simplifying Cell Type Specific States into 5 Groups



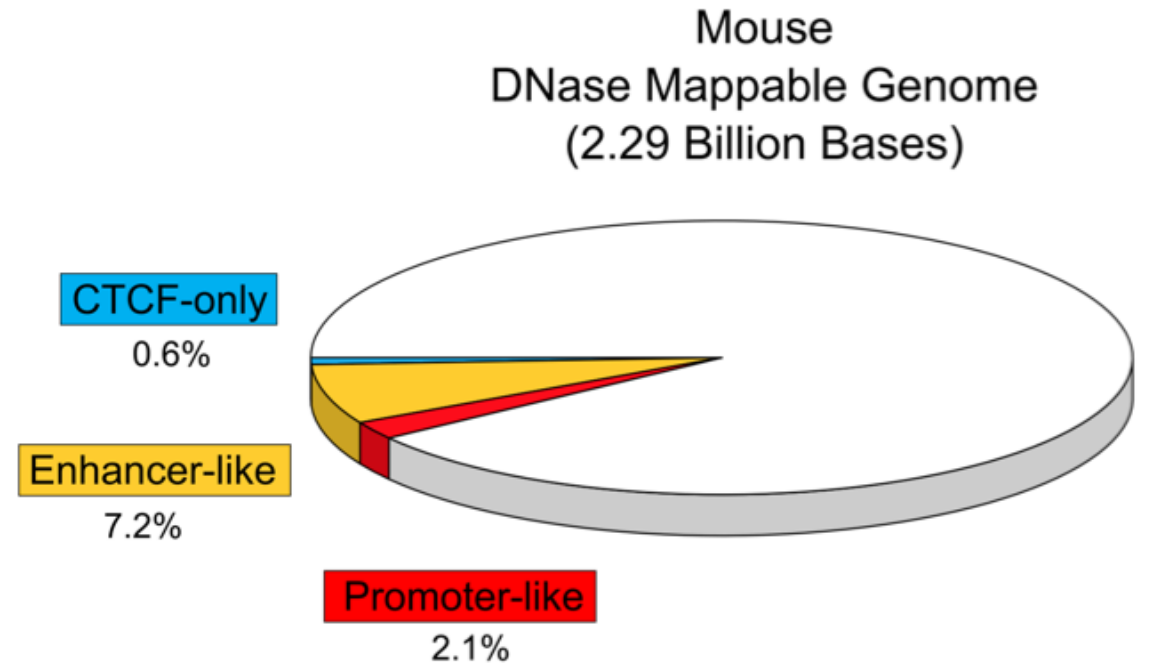
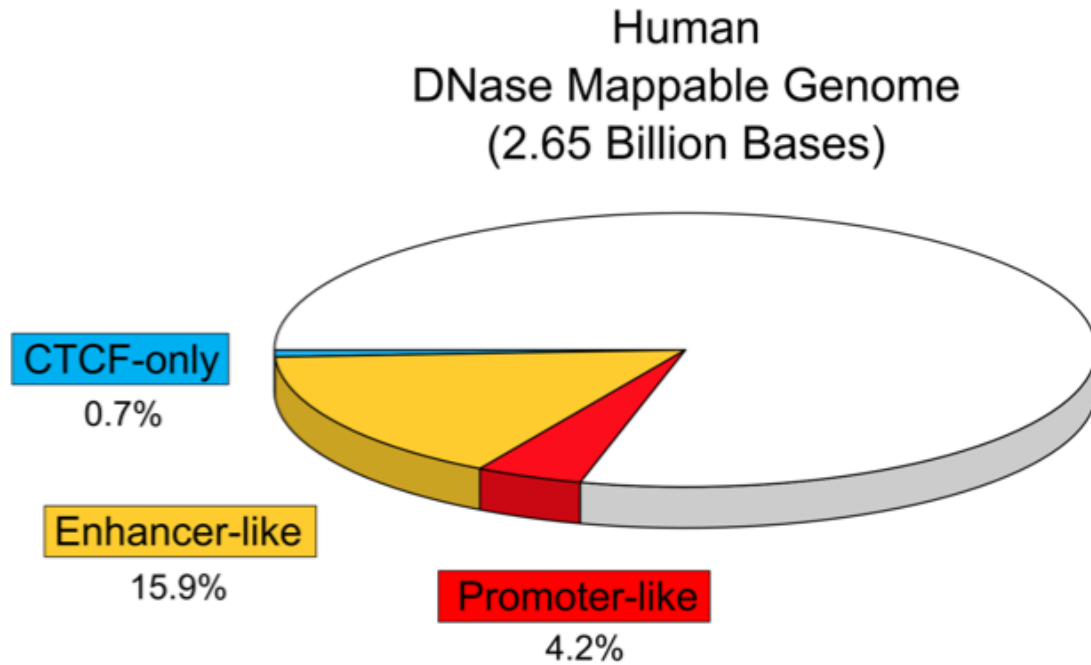
rDHSs are classified into five groups:

- Promoter-like signatures
- Enhancer-like signatures
- CTCF-only
- DNase-only
- Inactive

# Validation of 151 ELS cREs using transgenic assays

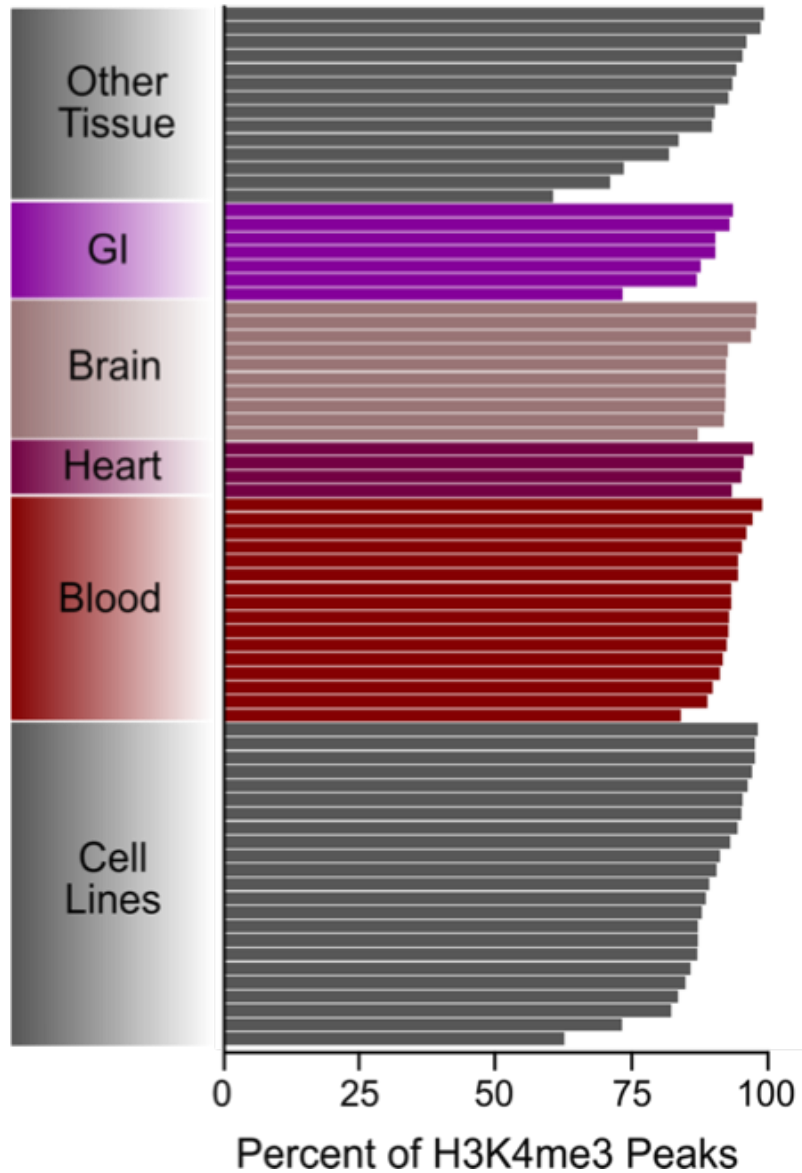


In total, we curated 1.3 million cREs in human and 431 thousand cREs in mouse.

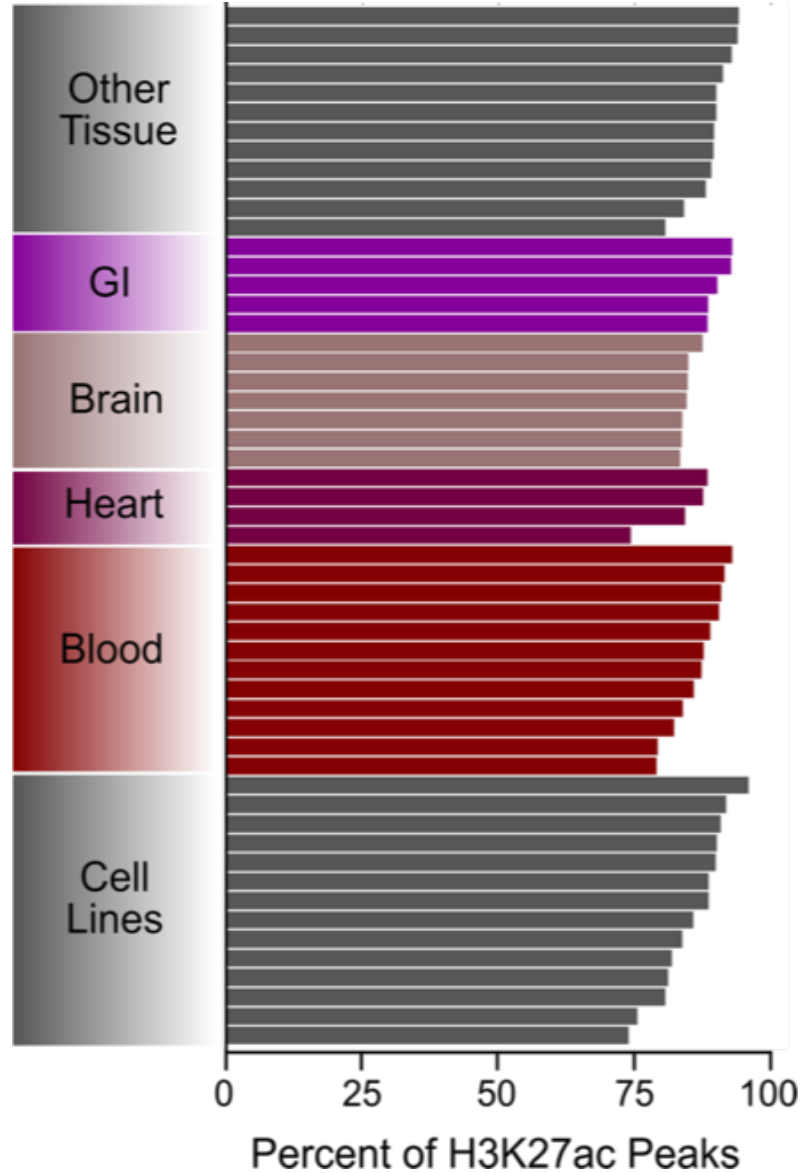


# Coverage of the Human cRE Registry in New Cell Types

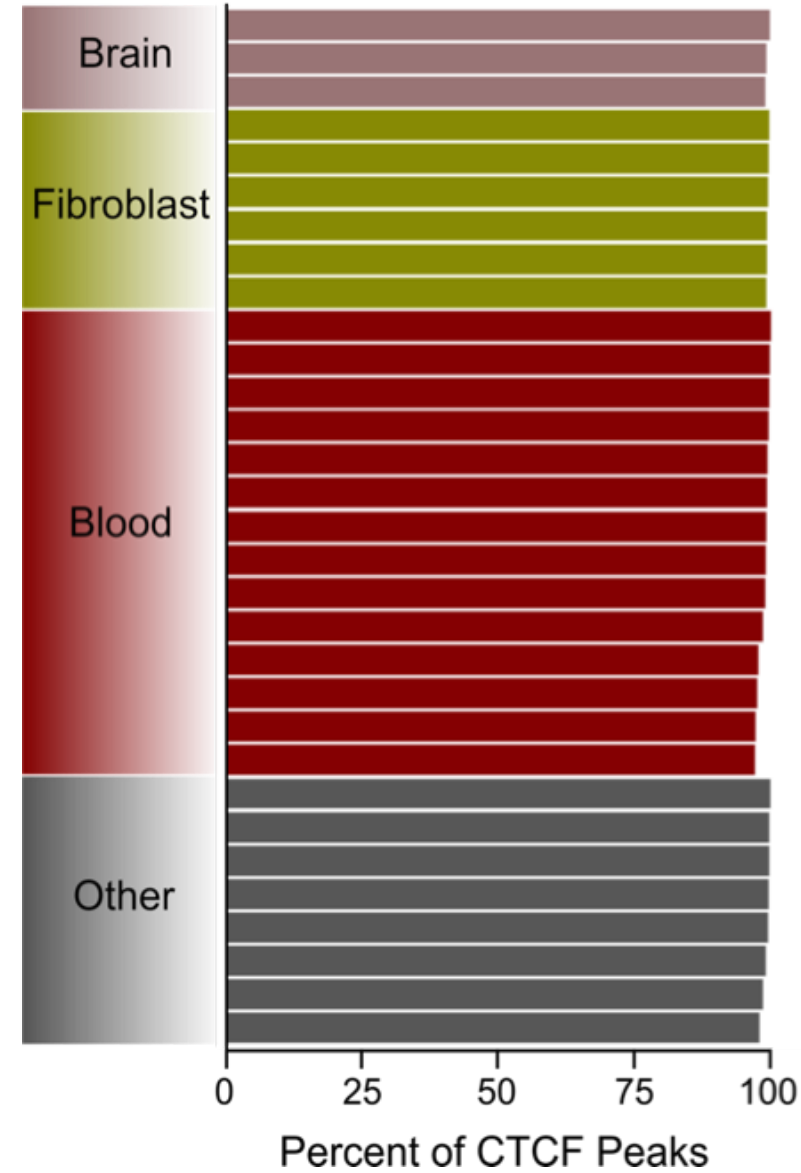
H3K4me3



H3K27ac



CTCF



# Disclosure for:

ASHG Interactive Workshop: Navigating the ENCODE Encyclopedia: Exploring Candidate Regulatory Elements, Linked Genes, and Genetic Variation with SCREEN

No Relevant Conflicts to Disclose:

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