

Neuronal Epigenome Mapping in the Healthy and Diseased Prefrontal Cortex

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Encode Users Meeting-2016

Stanford University

Palo Alto, CA

June 8th- 10th, 2016



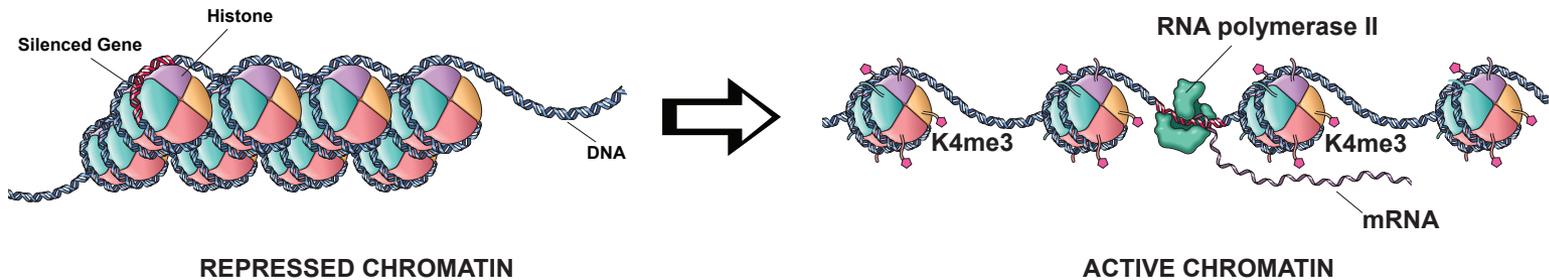
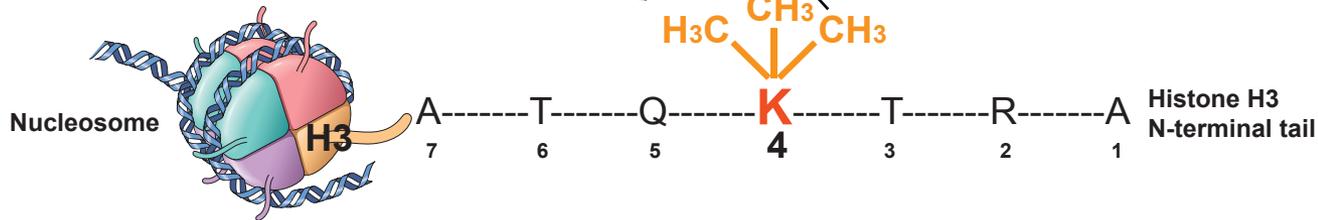
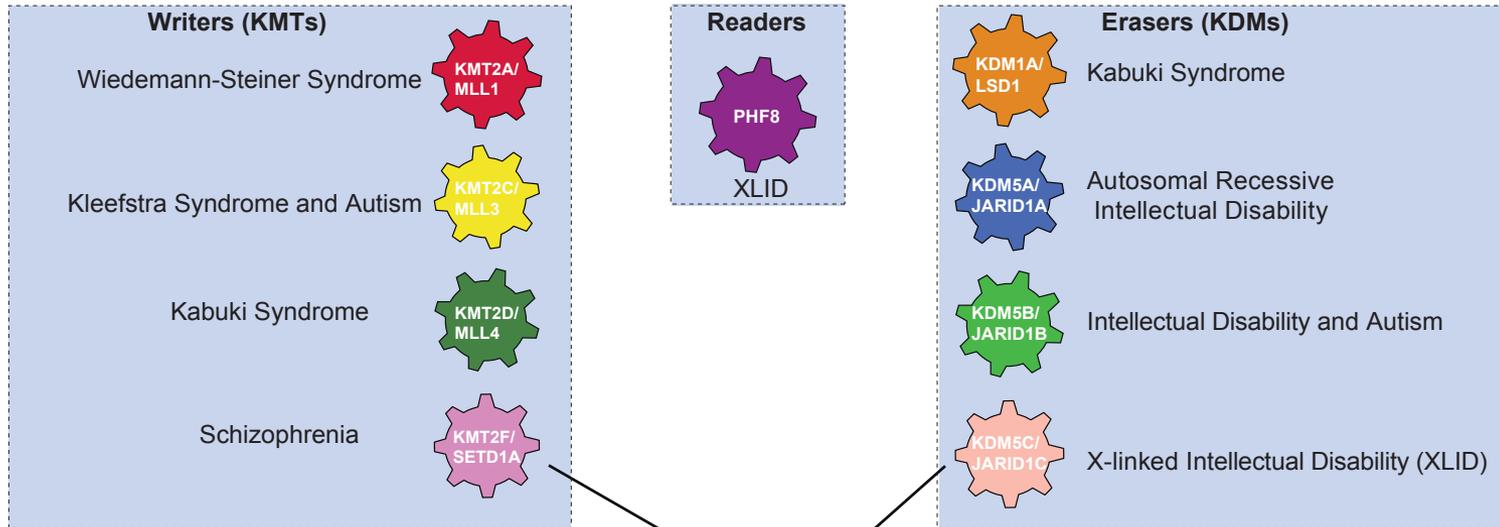
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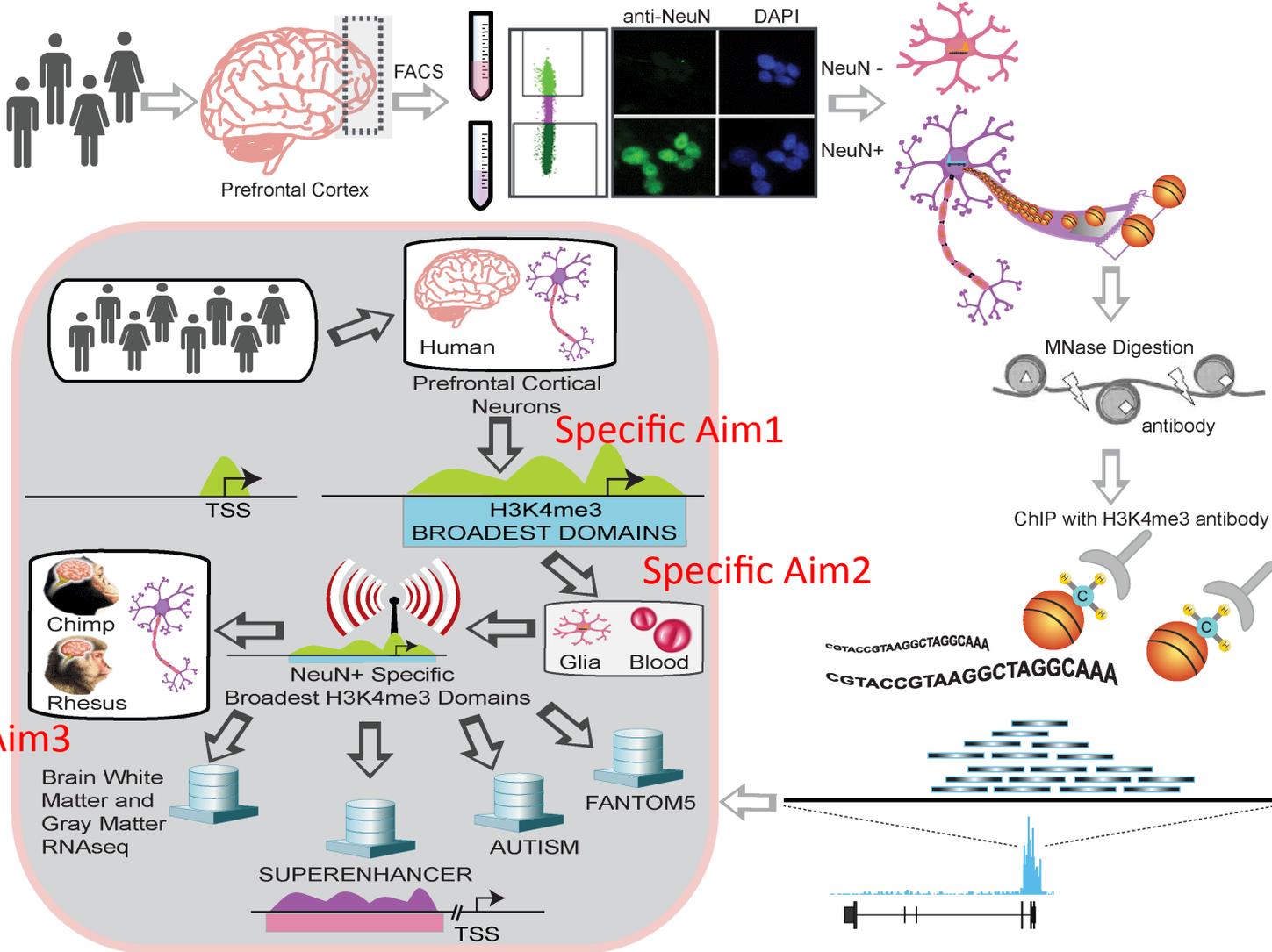
- General Background
- Hypothesis & Specific Aims
- Results & Summary
 - Novel Neuronal Regulators of Prefrontal Cortex
 - Broadest H3K4me3 Peaks as a Novel Epigenetic Signatures for Cell Identity
- Conclusions

Background

Histone 3 Lysine 4 Trimethylation (H3K4me3)

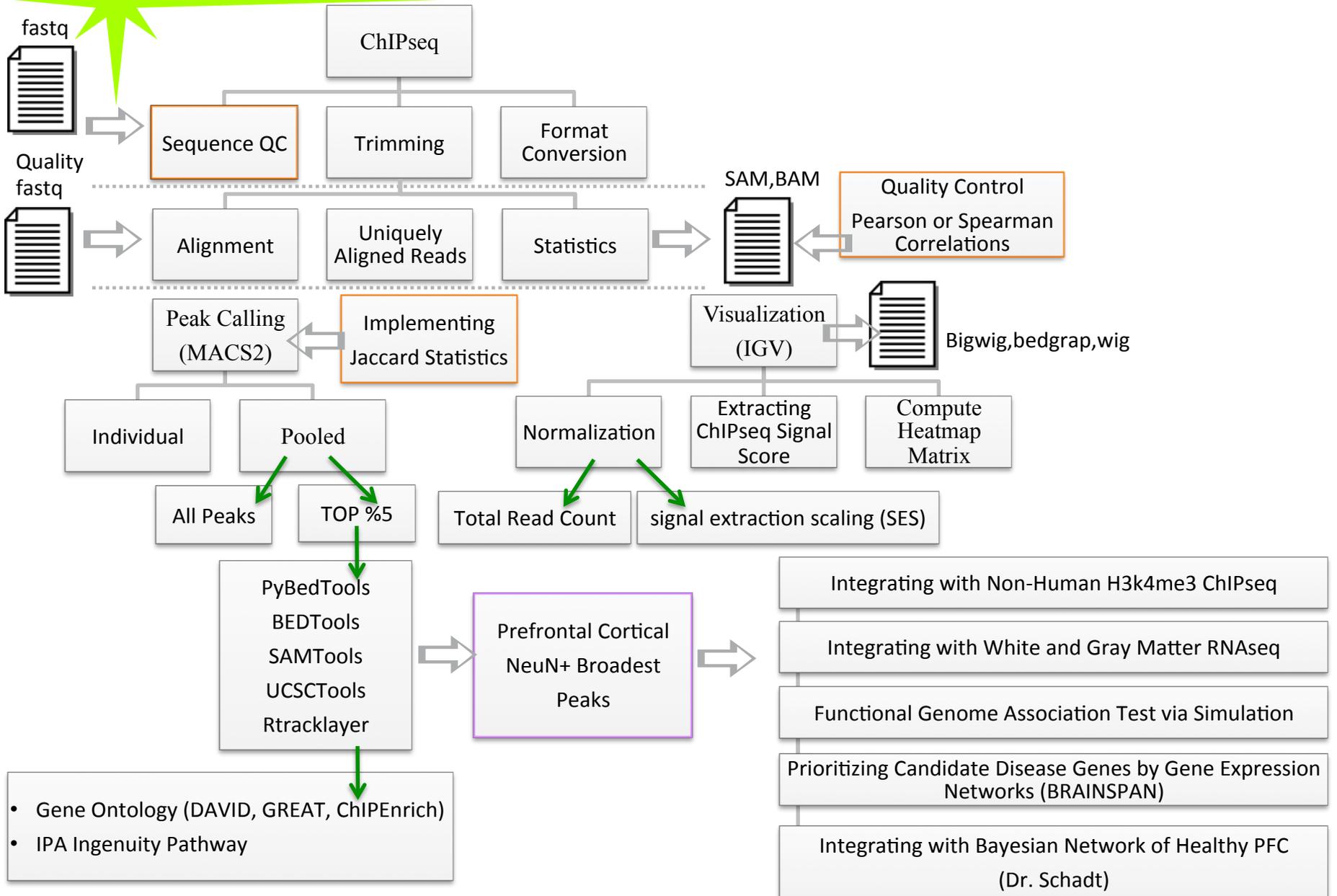


Hypothesis and Specific Aims



Hypothesis: Broadest H3K4me3 Domains enriched in cell type specific manner.

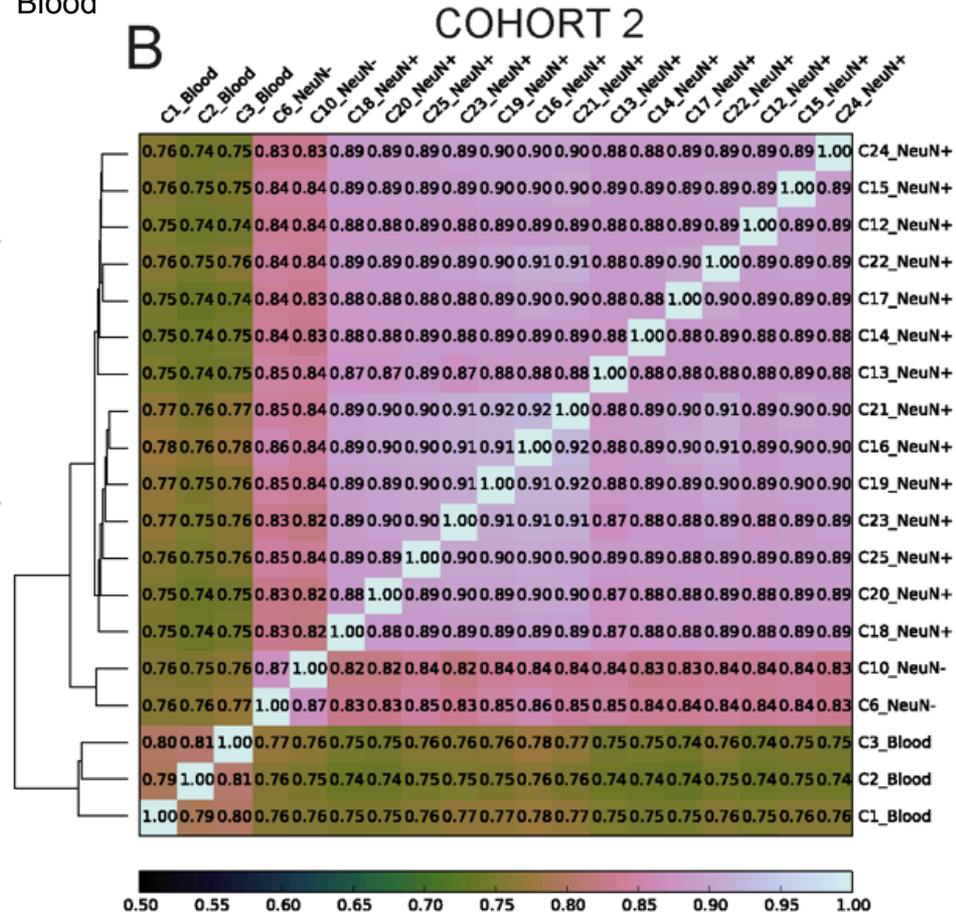
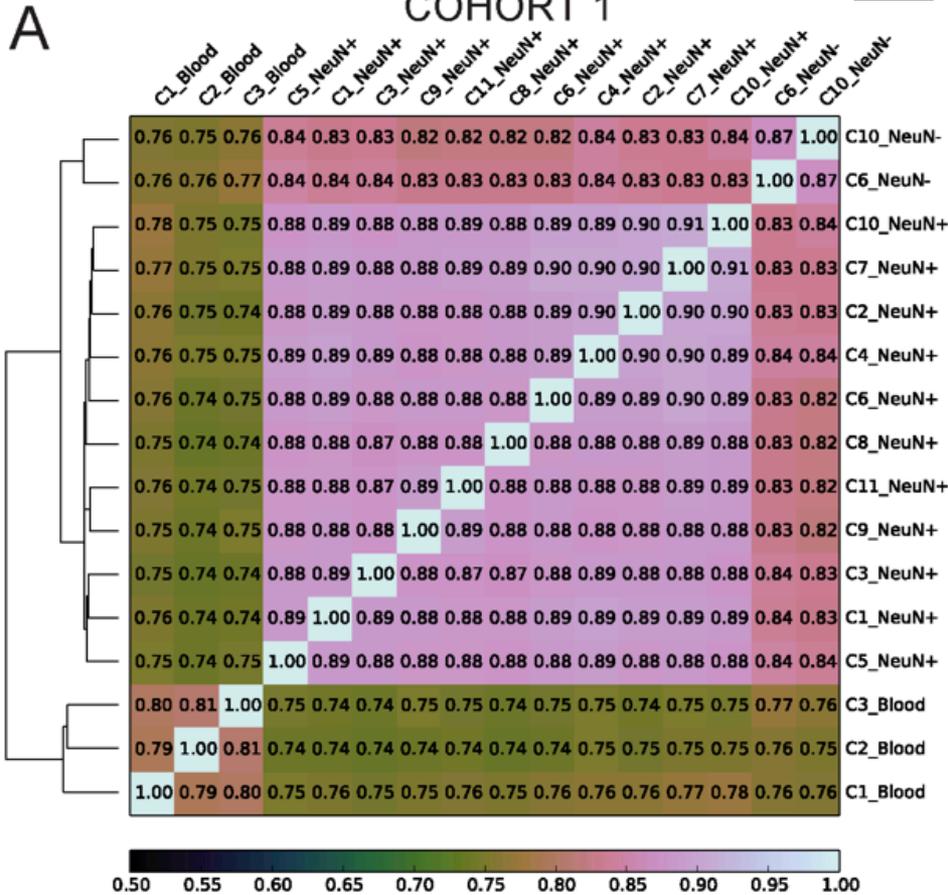
Method



Results

Pairwise Spearman rank-order correlation of the enrichment of H3K4me3 marker around TSS regions of RefSeq Genes

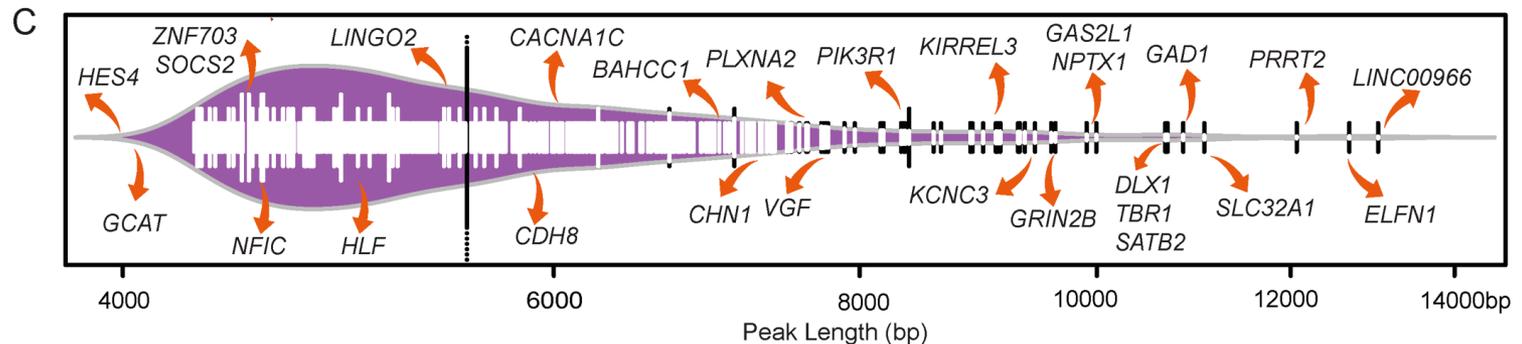
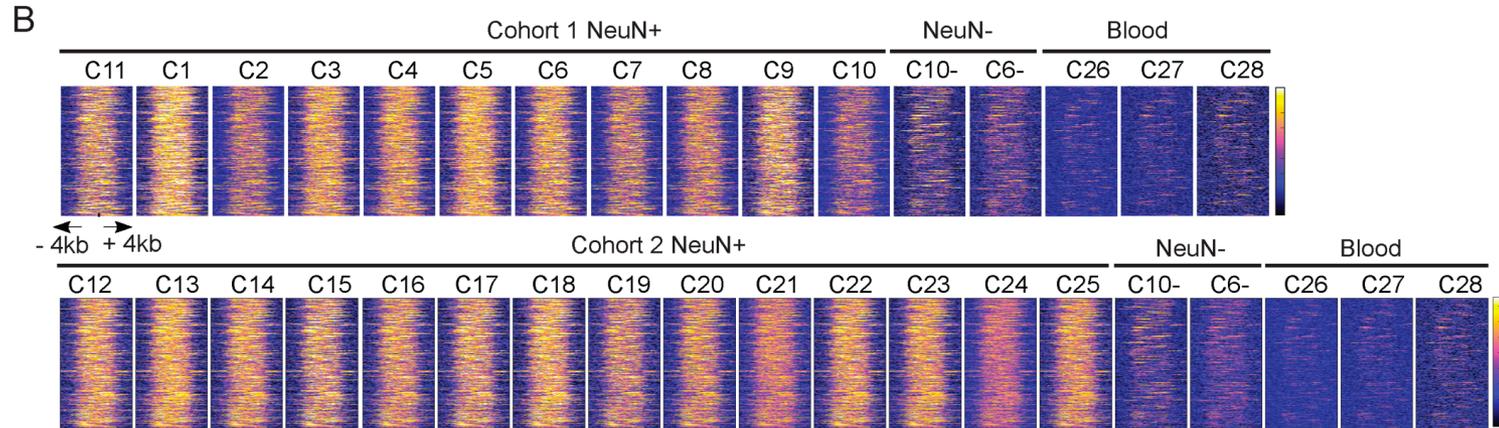
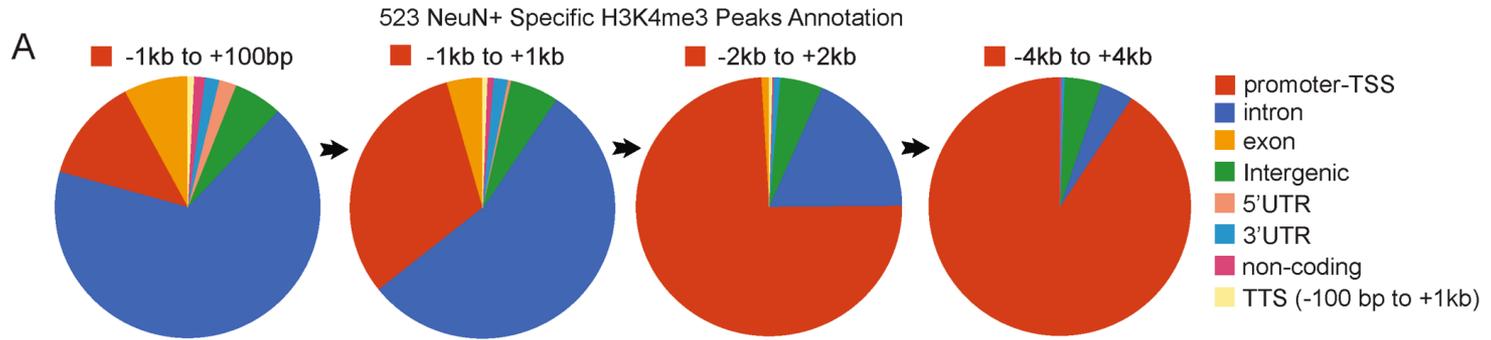
NeuN+
NeuN-
Blood



Across these different cell types, the intra-cell type correlations were systematically higher than inter-cell type correlations, each cell type clustering together in an unsupervised fashion

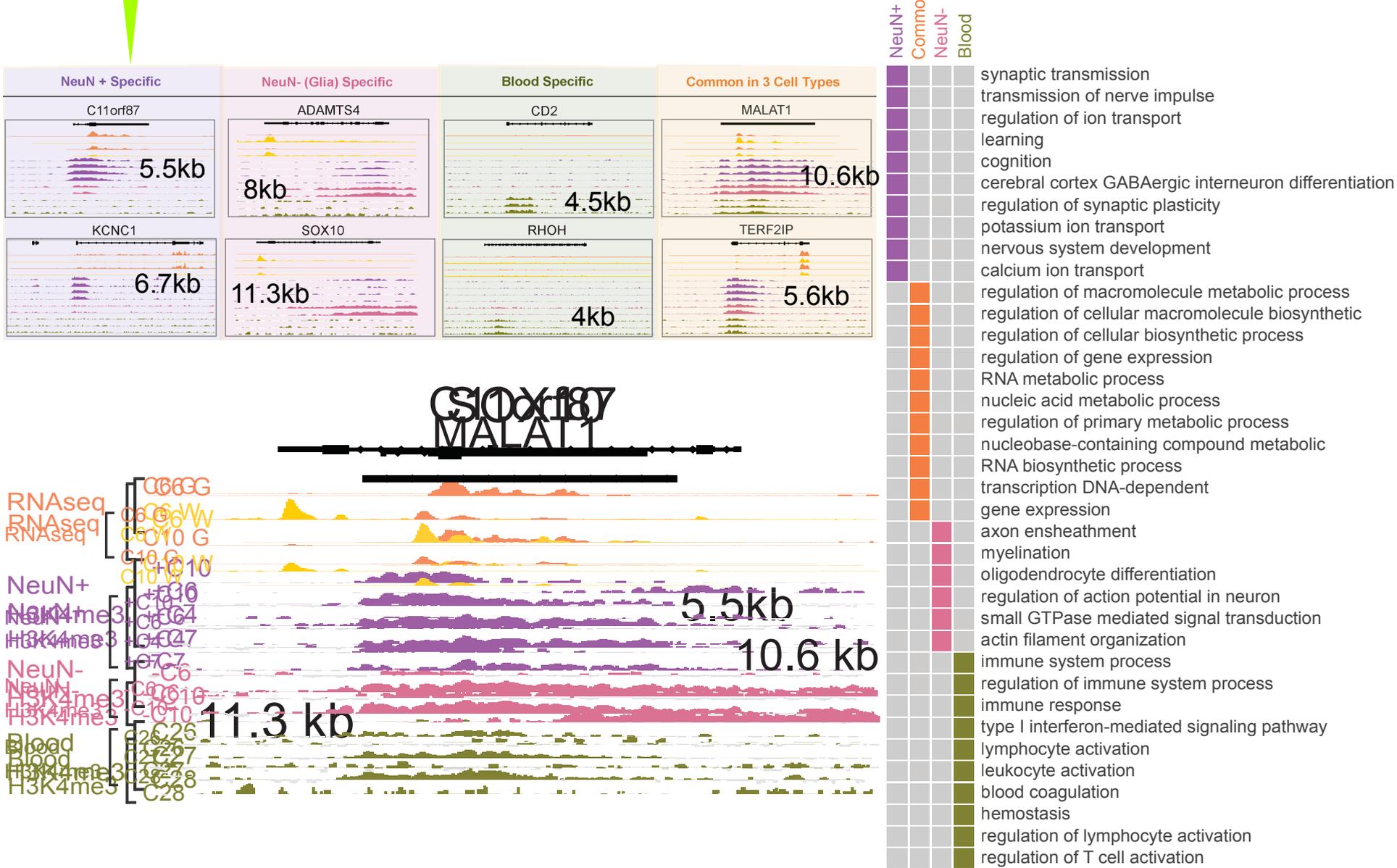
Results

523 NeuN+ Specific Peaks are mostly associated with TSS of neuronal genes



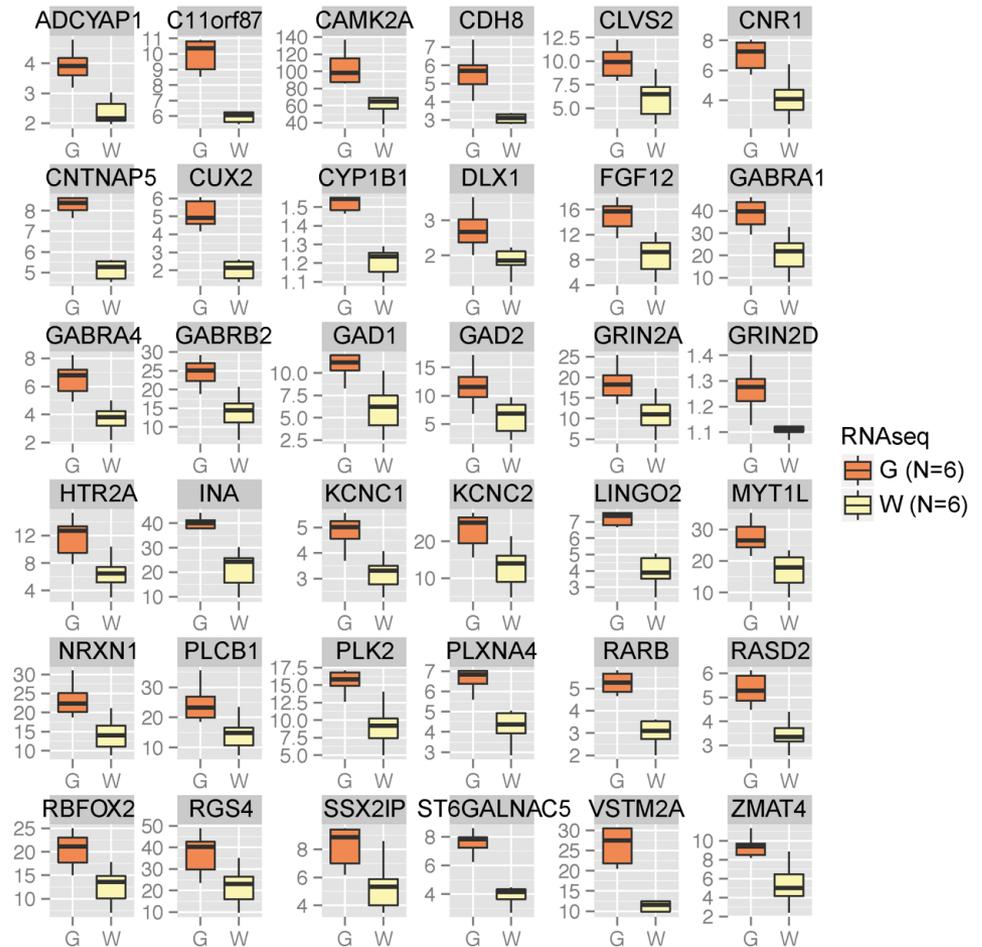
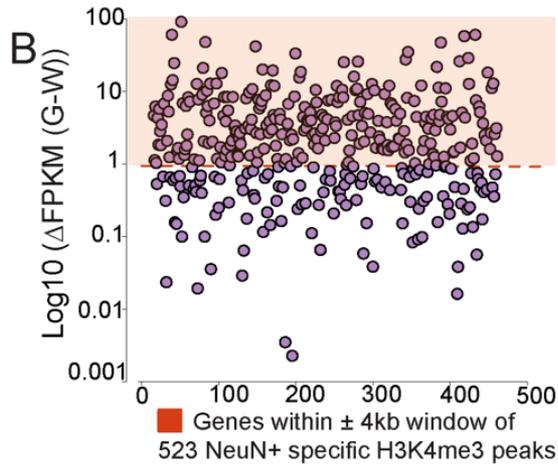
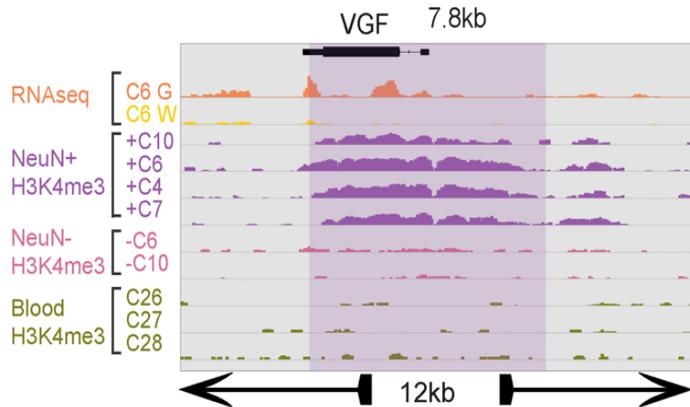
Summary

Summary of Broadest Cell Type Specific Peaks in 3 different cell types



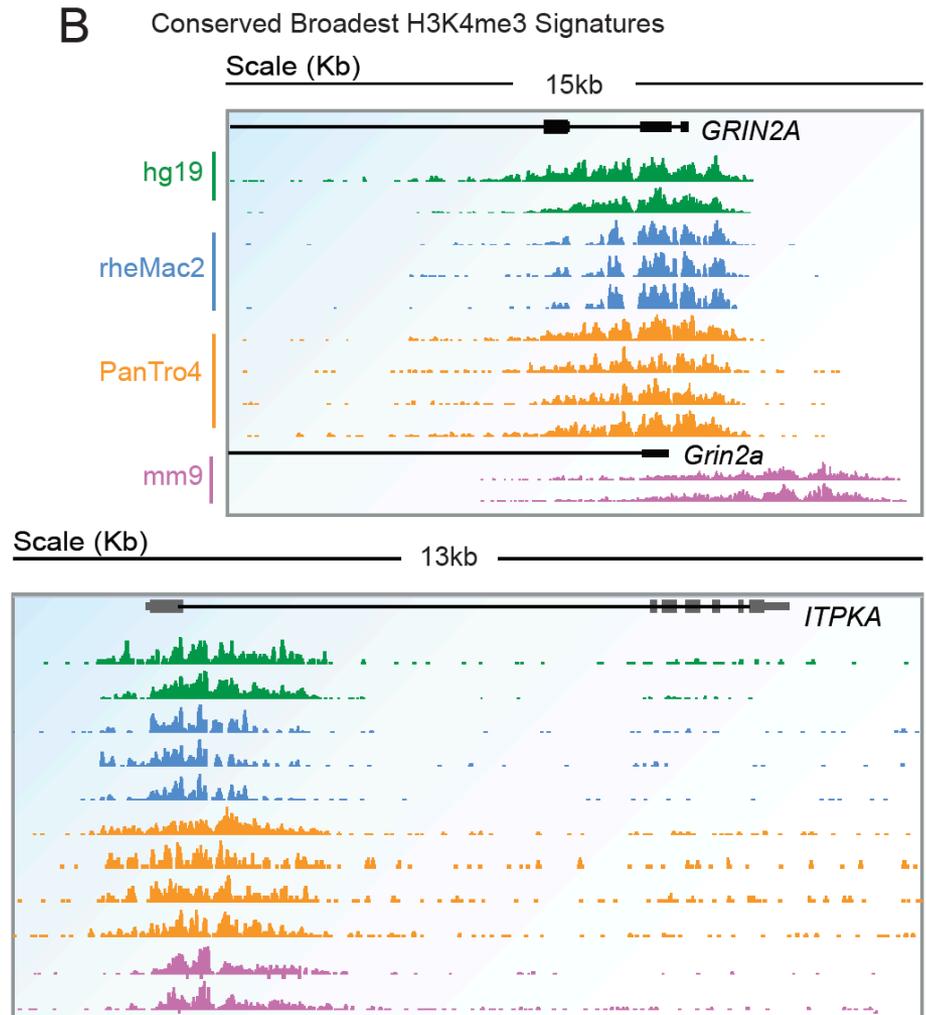
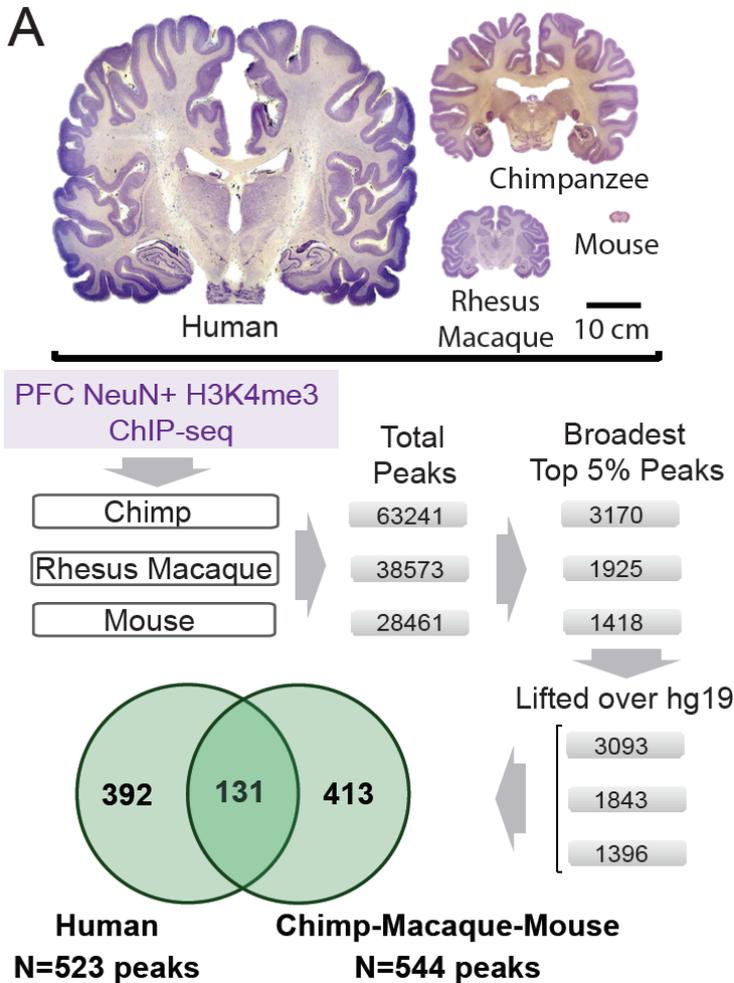
Results

Neuronal Broadest Peaks shows higher robust expression in Gray cortical matter vs subcortical white matter



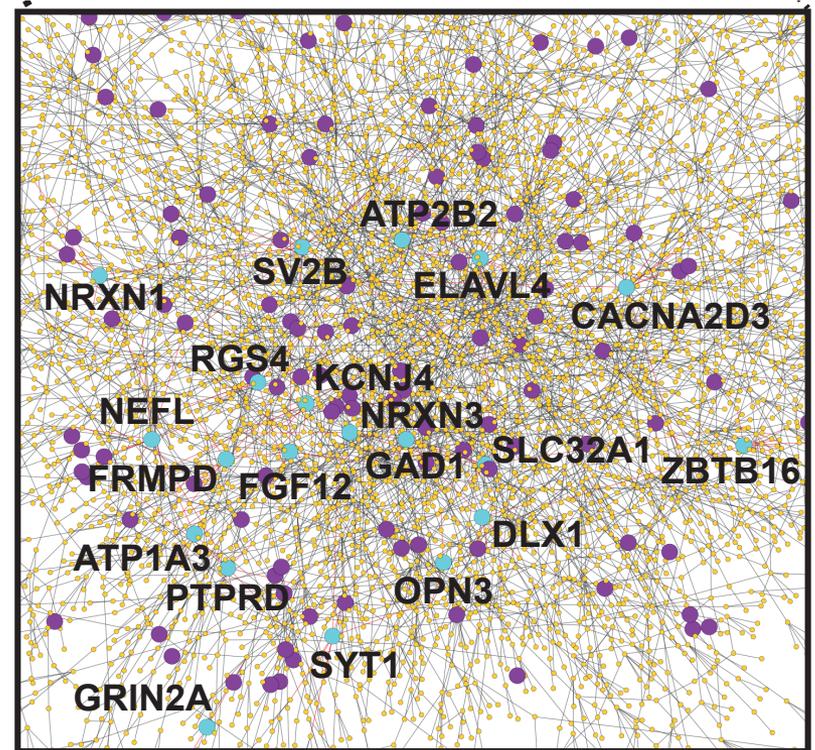
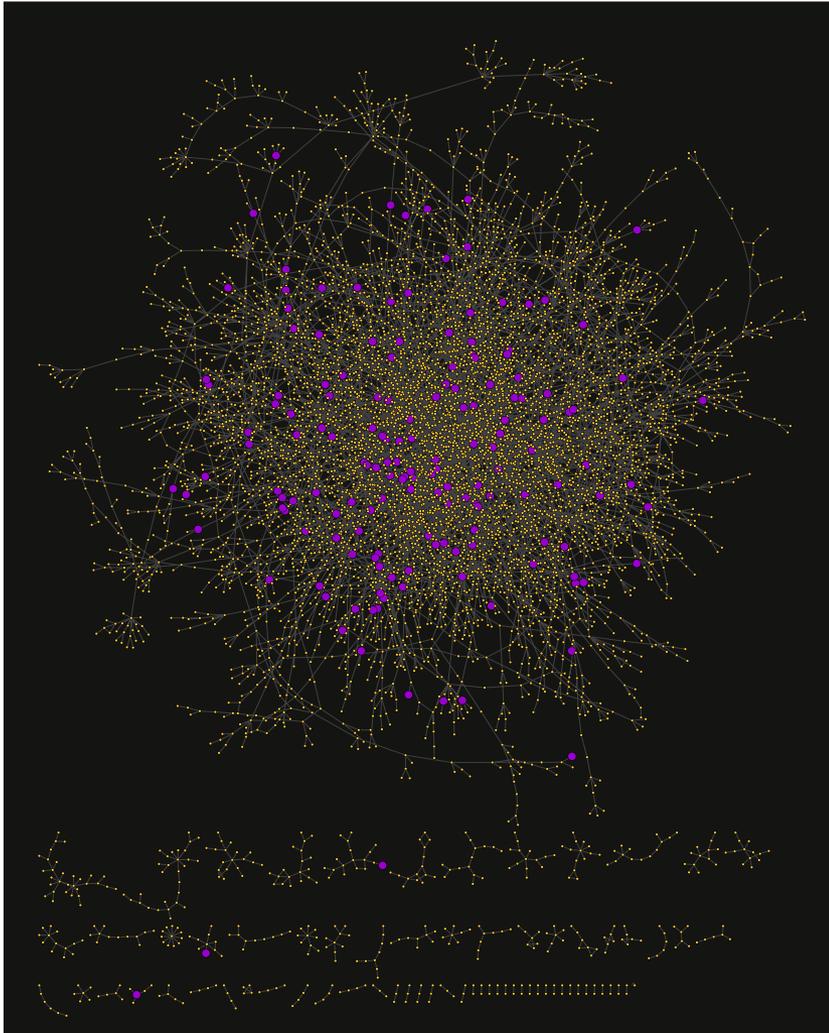
Results

Are these NeuN specific Broadest Peaks conserved in Chimp and Rhesus Macaque?

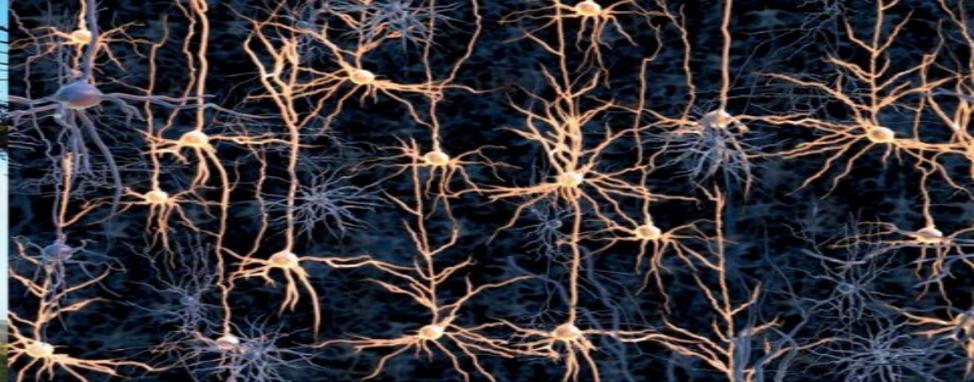


Prefrontal Cortex Bayesian Network

161 genes of NeuN specific Peaks are projected on Healthy Control Prefrontal Cortex Bayesian Network



Broadest neuron-specific peak associated genes are located in more central positions than other non-neuronal genes in the prefrontal cortex network and can reach other genes in the network more efficiently.



Acknowledgement

Schahram Akbarian's lab

THE FRIEDMAN
BRAIN INSTITUTE



Funding: Autism Speaks



The 2014 class of Autism Speaks Weatherstone Predoctoral Fellows, with Lady Weatherstone (center), Stavros Niarchos Foundation Chief Operating Officer Vasilii Tsamis (far left) and Autism Speaks President Liz Feld (far right).

Eric E. Schadt's lab

