¿Do We Have Black Chromatin?

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Master Thesis Presentation

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Acknowledgments

A dream you dream alone is only a dream. A dream you dream together is reality. -Yoko Ono

- **Supervisors:**
  - Dr. Guillaume Filion
  - Dr. Hans van der Spek
- **Team Players:**
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  - Marc Corrales
  - Dr. Olivera Vujatovi
  - Catarina De Oliveira
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  - Fontane
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  - Erasmus Programme

Today's Menu

Prelude

Top 10 Most Frequent Words

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Summary in 4 Sentences

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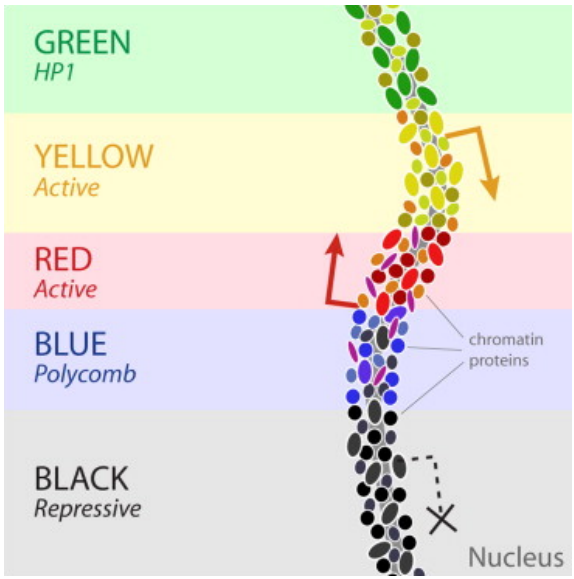
- Here, we present a genome-wide chromatin landscape in Human H1-hESC based on 68 chromatin features covering histone modifications and transcription factors.
- Further supported by other datasets (Lamina-associated domains, CpG islands, RefSeq gene and exon, open chromatin, and RNA-seq), we confirm the existence of Black chromatin among these four major chromatin types in Human.

Introduction

Black Chromatin: Revisited

“

Chromatin state is a segmentation of the genome based on a unique combination of chromatin proteins.



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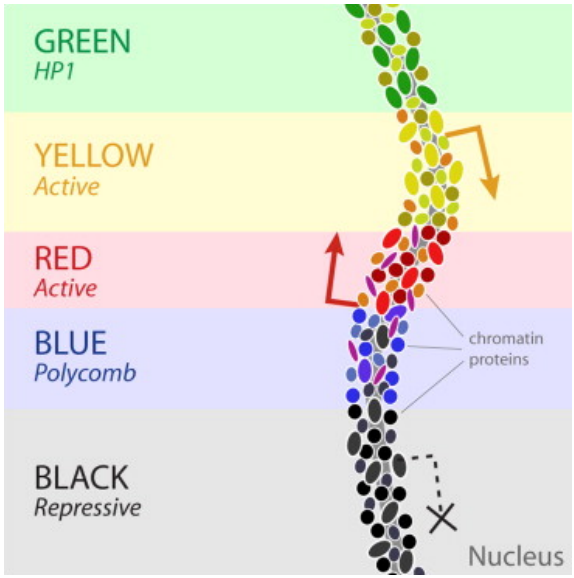
Black Chromatin: a novel type of repressive chromatin



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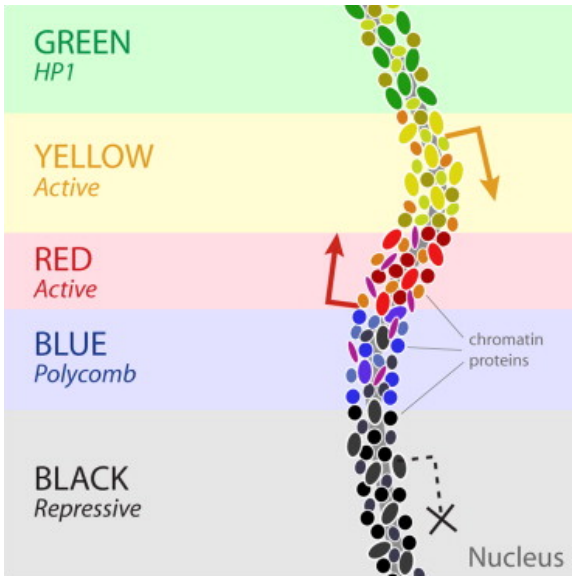

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Black Chromatin: a novel type of repressive chromatin

- Hardly no binding of chromatin proteins

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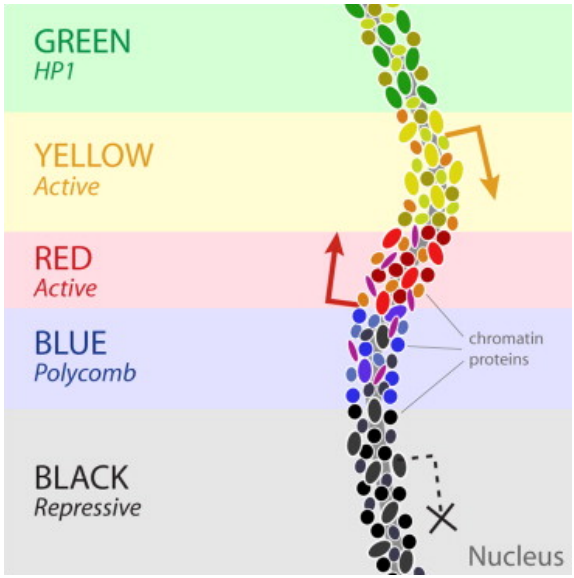

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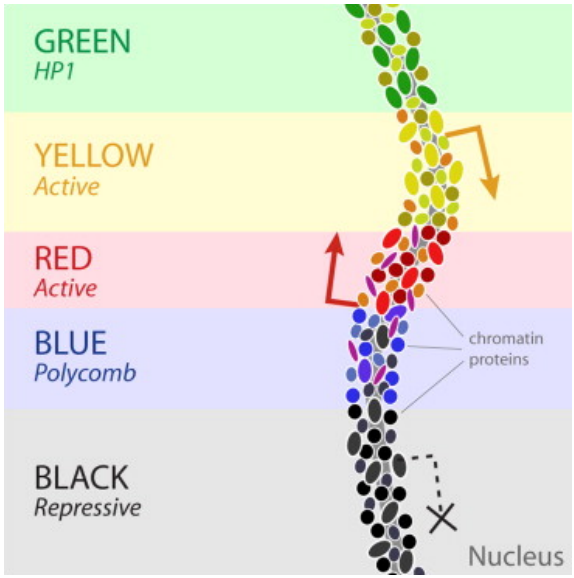

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Black Chromatin: a novel type of repressive chromatin

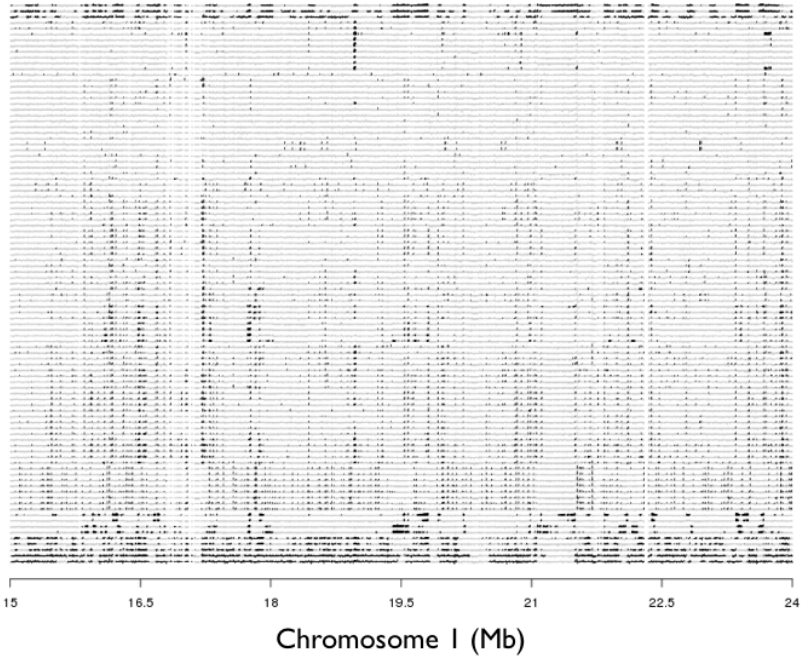
- Hardly no binding of chromatin proteins
- Black covers 48% of the genome
- Harboring $\approx$ 4000 genes that are linked to developmental regulation

Yes|No

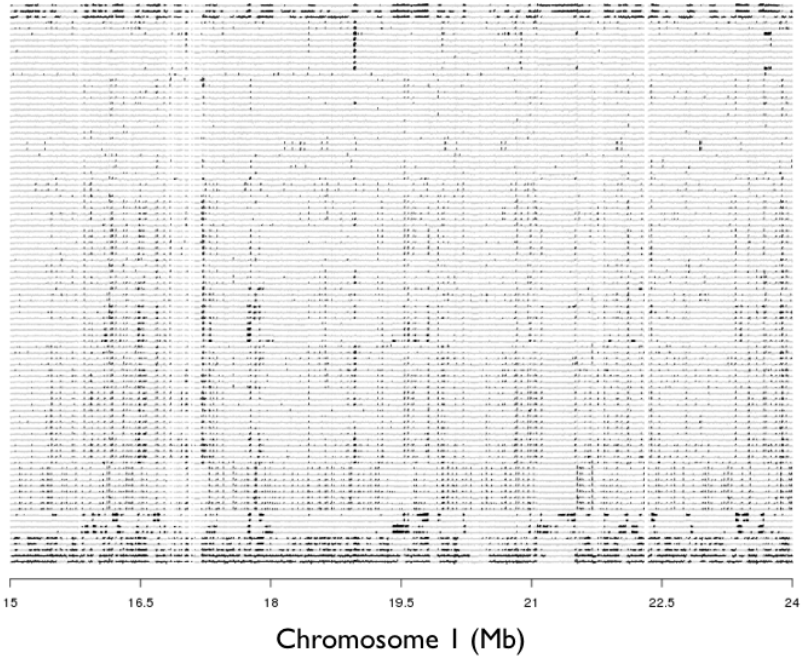
Yes|No

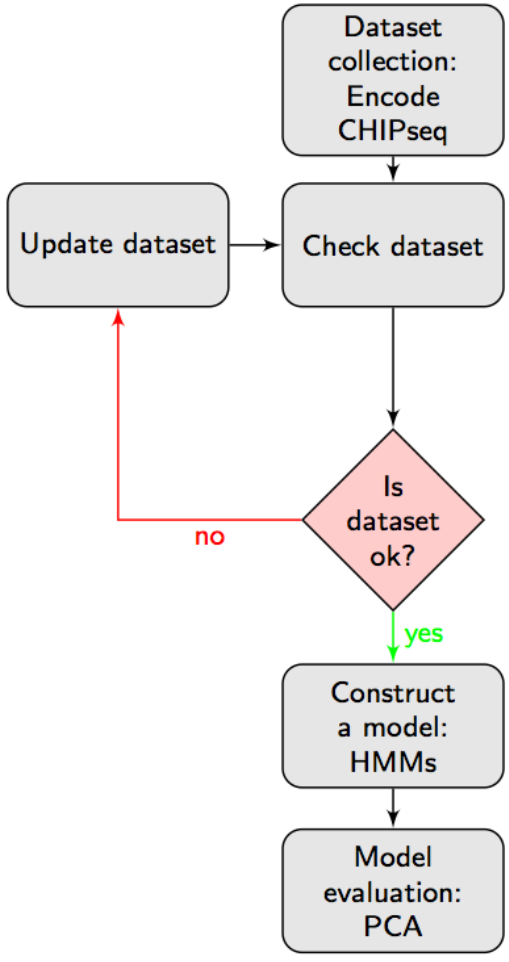
So far Black was only identified in *Drosophila*...
Does Black also present in Humans?

Our Strategy



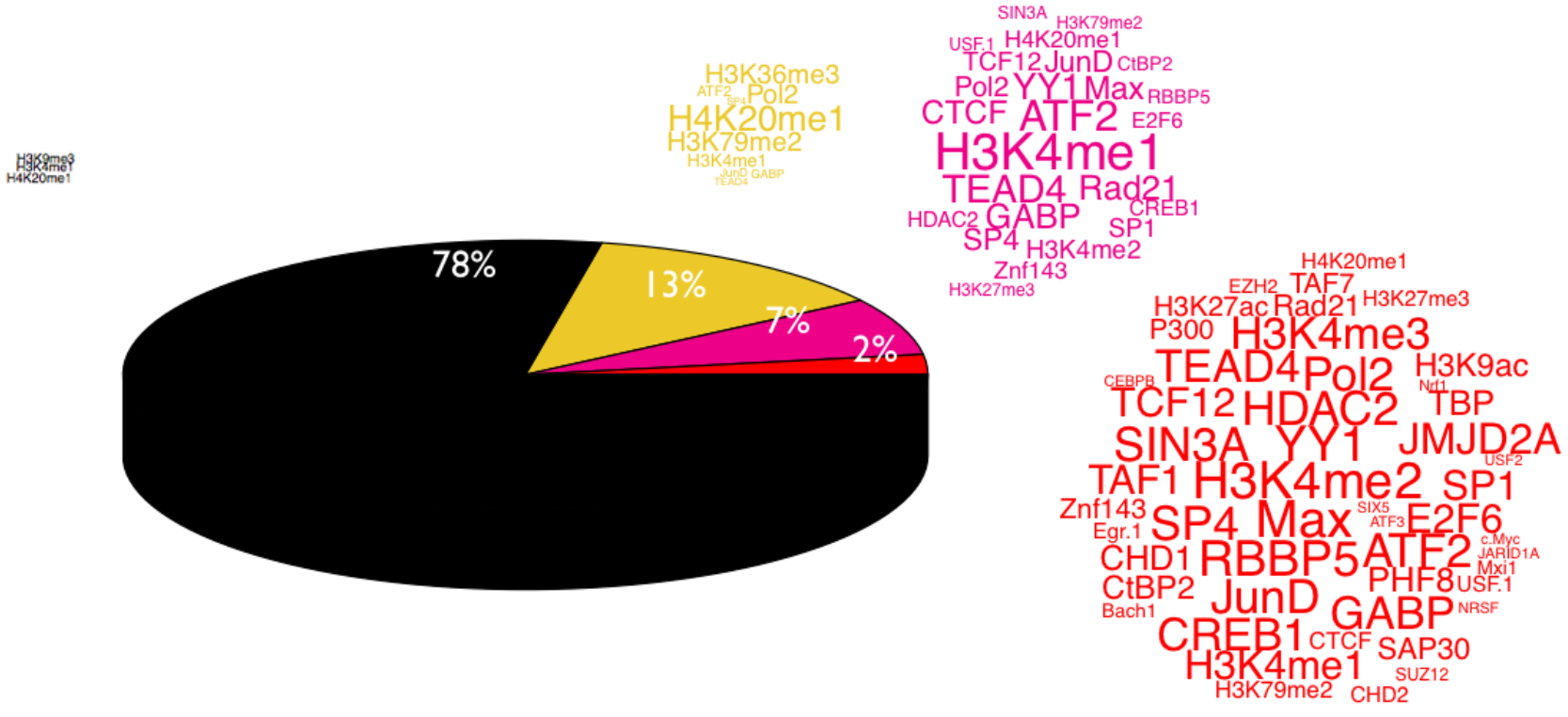
Our Strategy





4 Chromatin States in H1-hESC ▸ Animated here

Black Is among Our Four Chromatin States



Features of Black Chromatin

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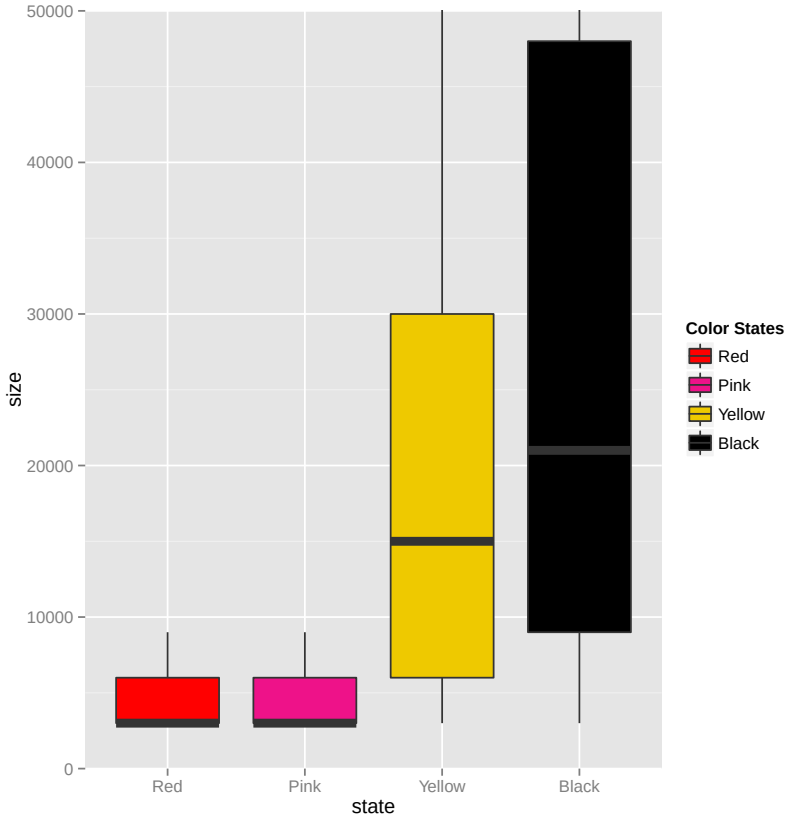

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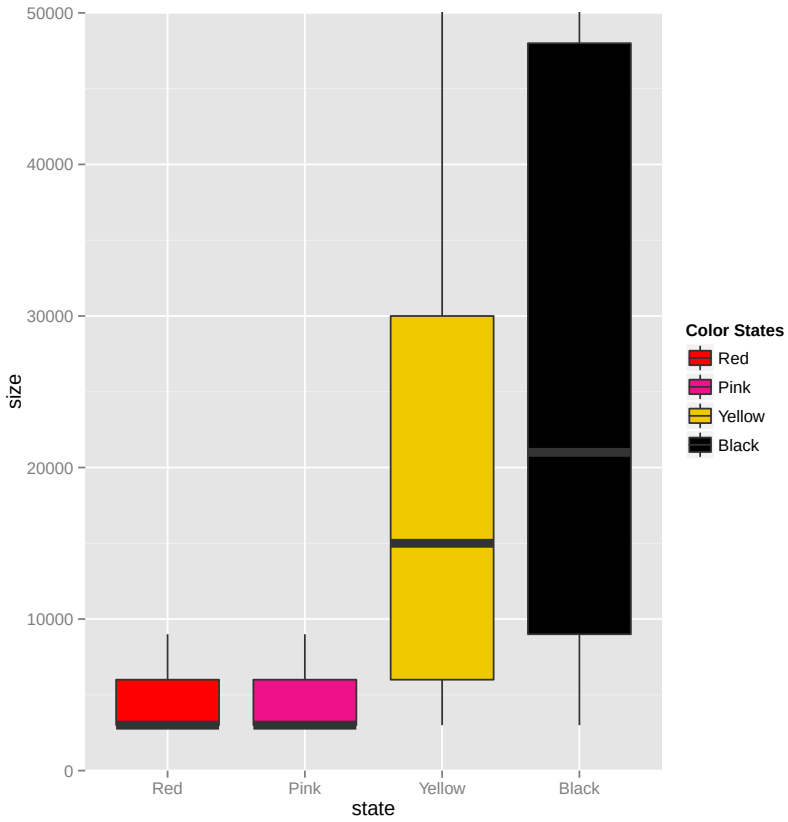

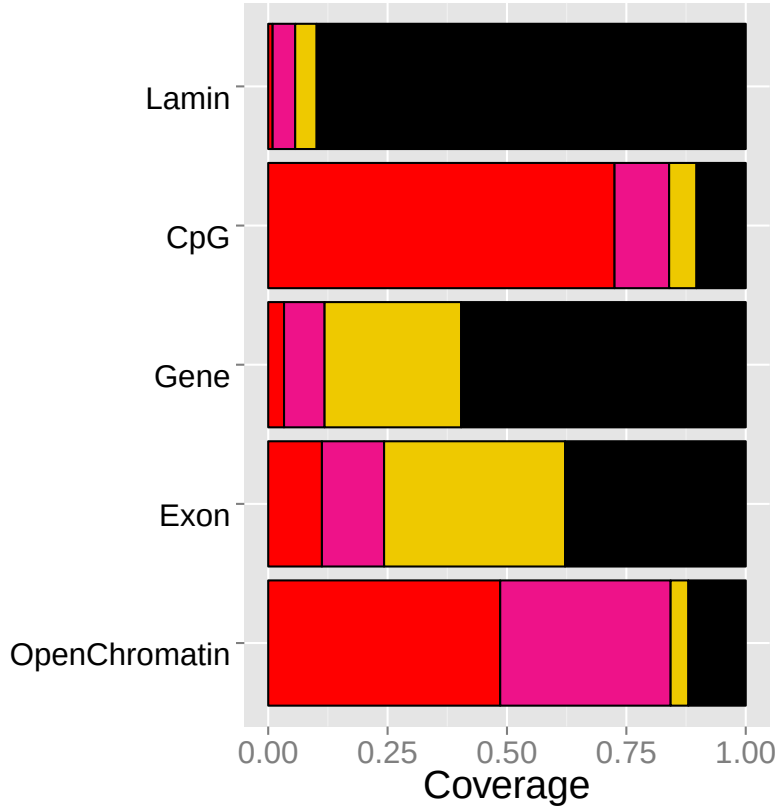

Expression Levels of Black Chromatin

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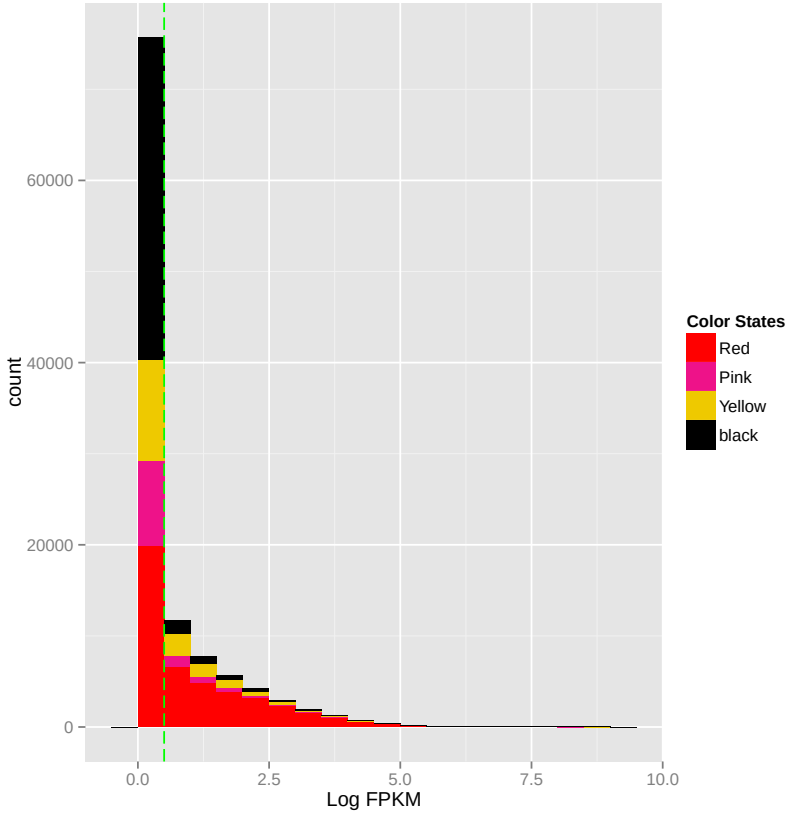

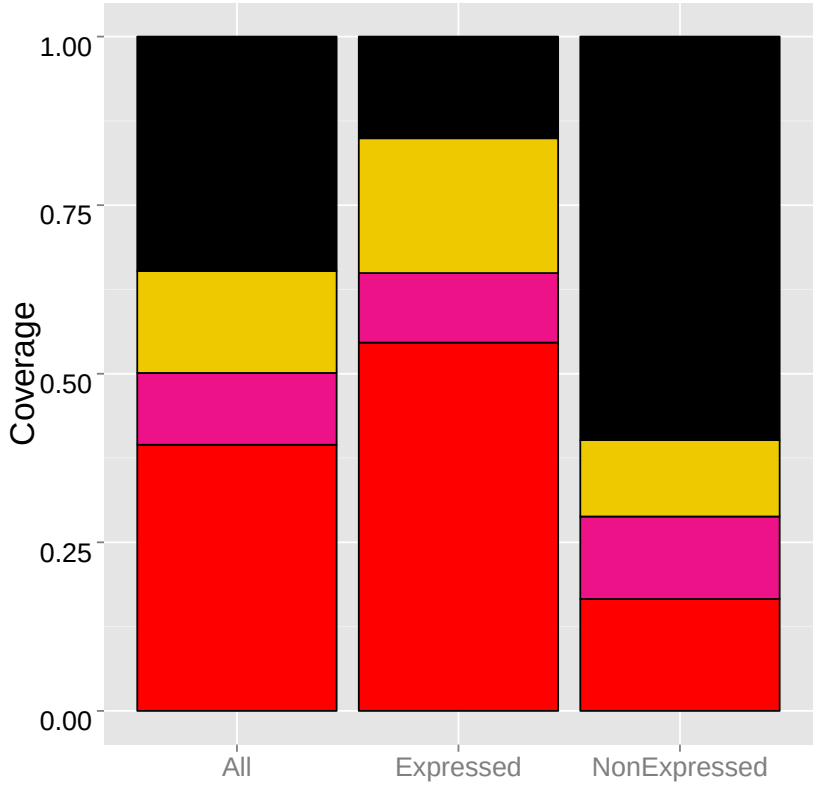

Black Points toward Facultative Biological Process

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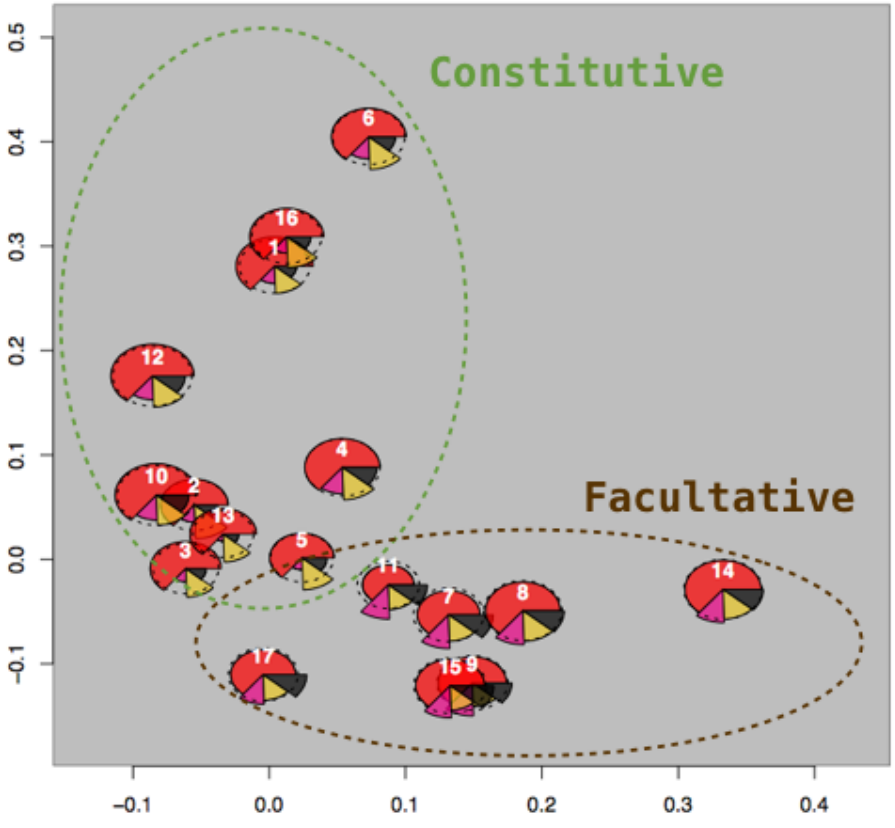

No	GO_ID	GO_Term
1	GO:0006259	DNA metabolic process
2	GO:0006397	mRNA processing
3	GO:0006412	translation
4	GO:0006464	cellular protein modification process
5	GO:0006913	nucleocytoplasmic transport
6	GO:0007049	cell cycle
7	GO:0007155	cell adhesion
8	GO:0007165	signal transduction
9	GO:0007267	cell-cell signaling
10	GO:0009058	biosynthetic process
11	GO:0030198	extracellular matrix organization
12	GO:0034641	cellular nitrogen compound metabolic process
13	GO:0042254	ribosome biogenesis
14	GO:0048856	anatomical structure development
15	GO:0050877	neurological system process
16	GO:0051276	chromosome organization
17	GO:0055085	transmembrane transport

Conclusion

- Utility of integrative analysis in Chromatin of H1-hESC

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  - Mechanistic explanations of Black Chromatin in Human?

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- ¿Do We have Black Chromatin?
  - **Yes**, we have
- **Future perspectives:**
  - Mechanistic explanations of Black Chromatin in Human?
  - Going forward from a normal $\rightarrow$ disease condition?


THANK YOU
I'LL TAKE THE BLACK
memegenerator.net

Q&A