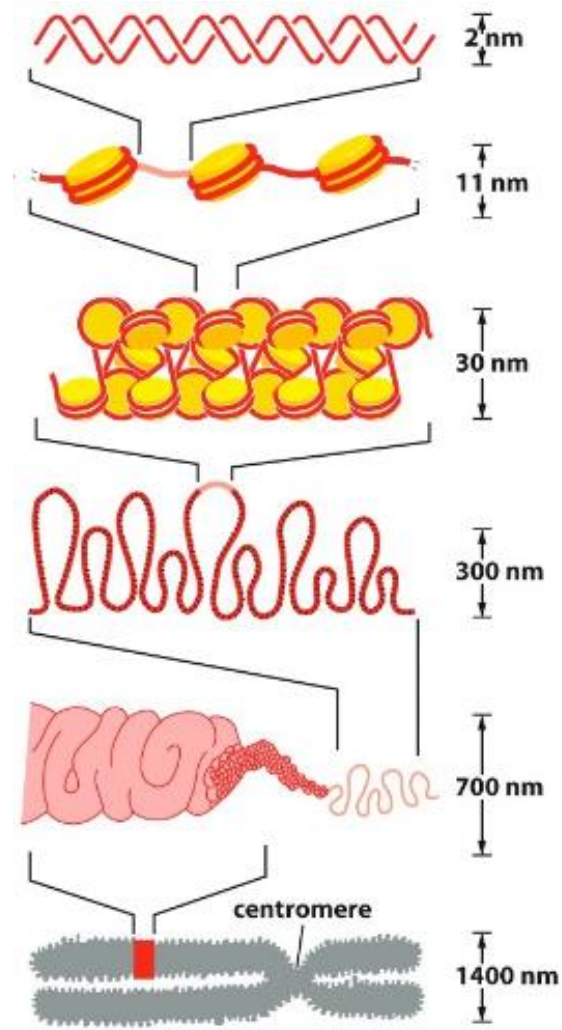
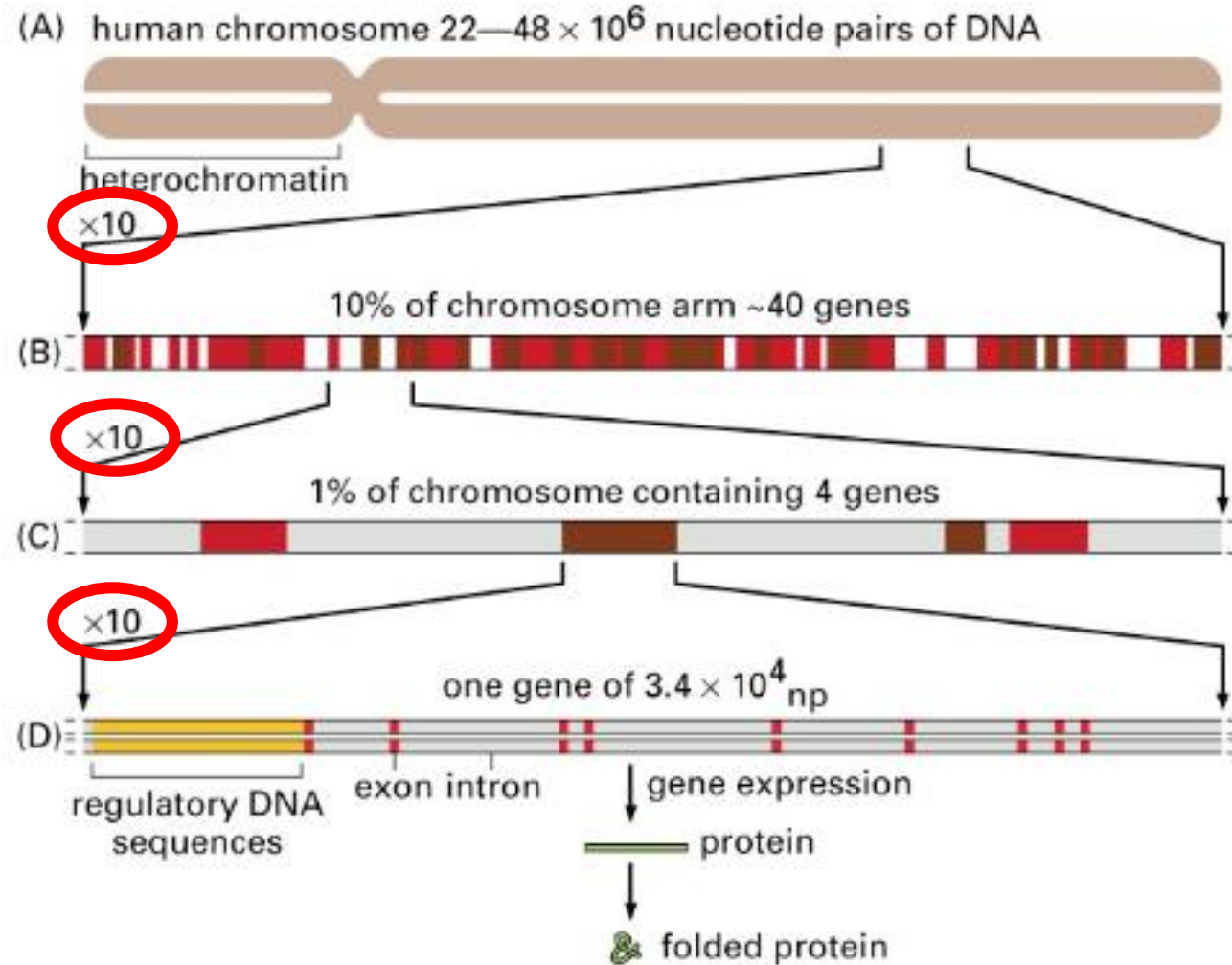


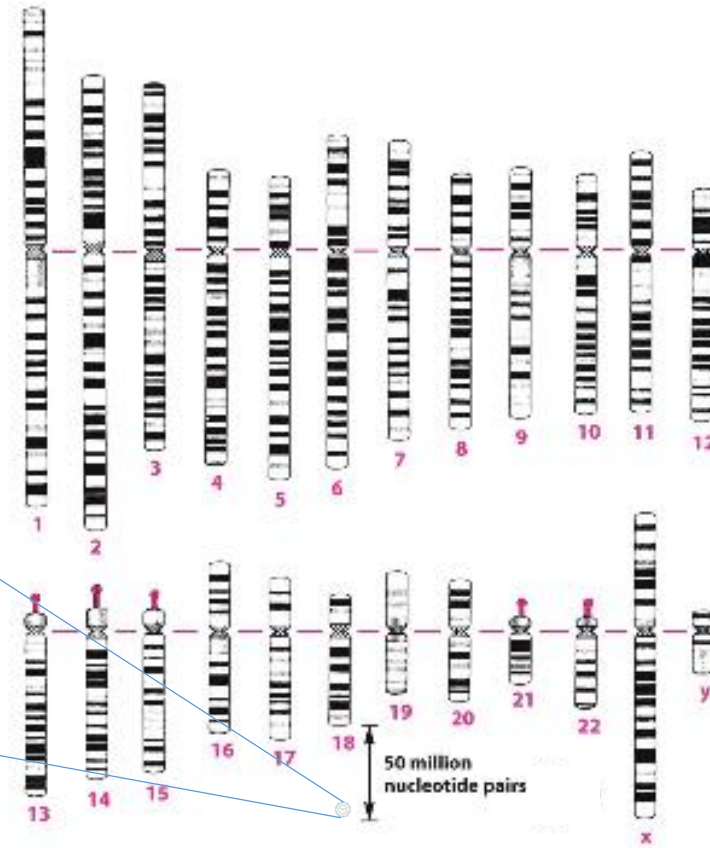
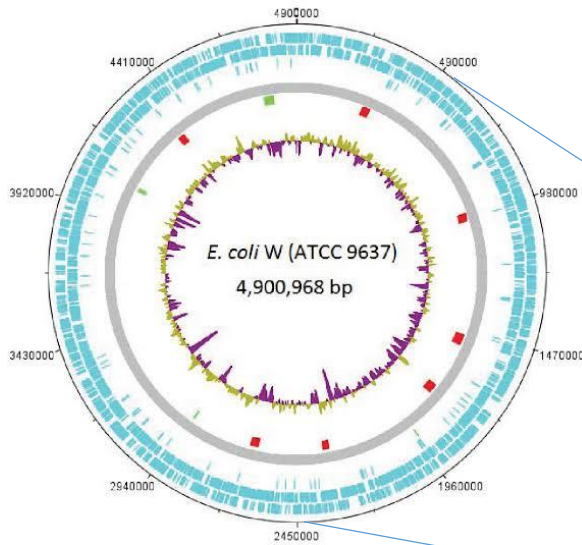
Cromatina e Epigenética



Genes e cromossomos em escala



O problema



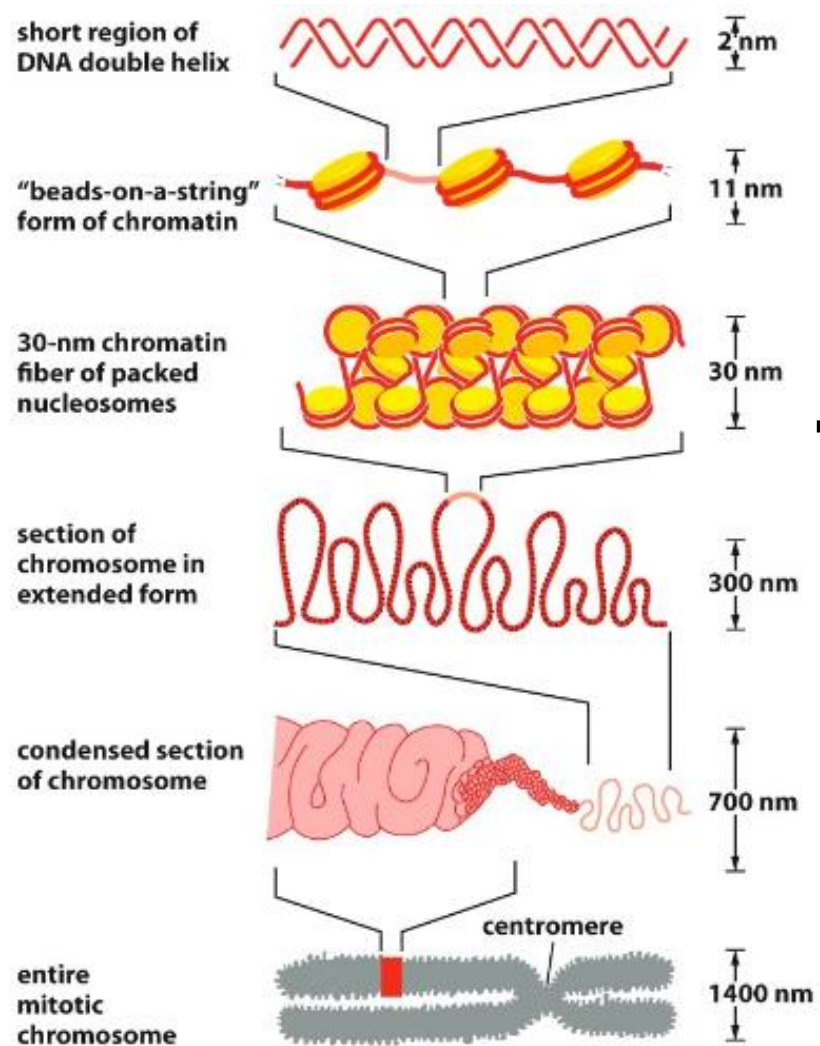
Genoma de E.coli tem 5Mb
Diâmetro célula 1-2 μ m

Genoma humano 3 Gb (quase 1000x maior)

Esticado, DNA em cada célula humana tem 2m de comprimento
Núcleo tem 8 μ m de diâmetro (=0.008mm =0.000008m)

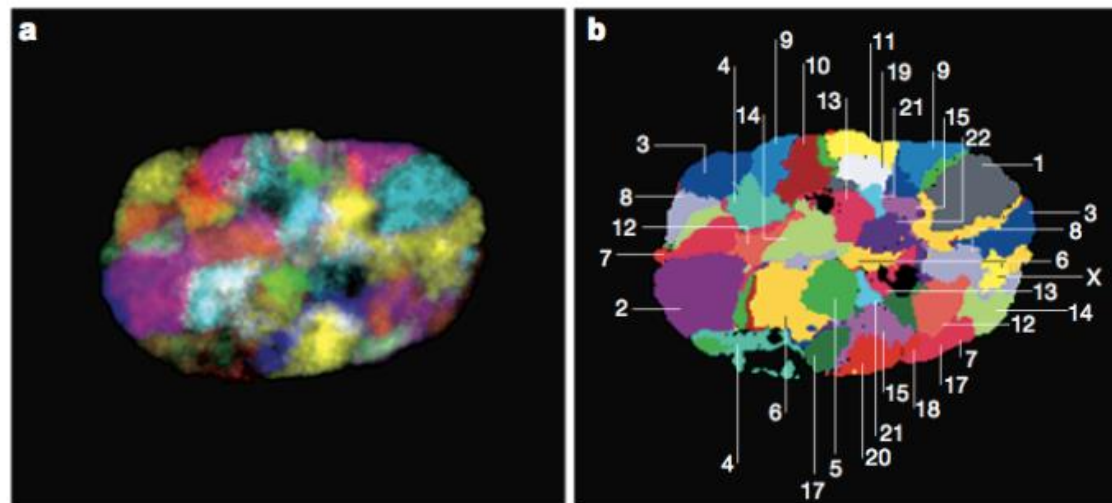
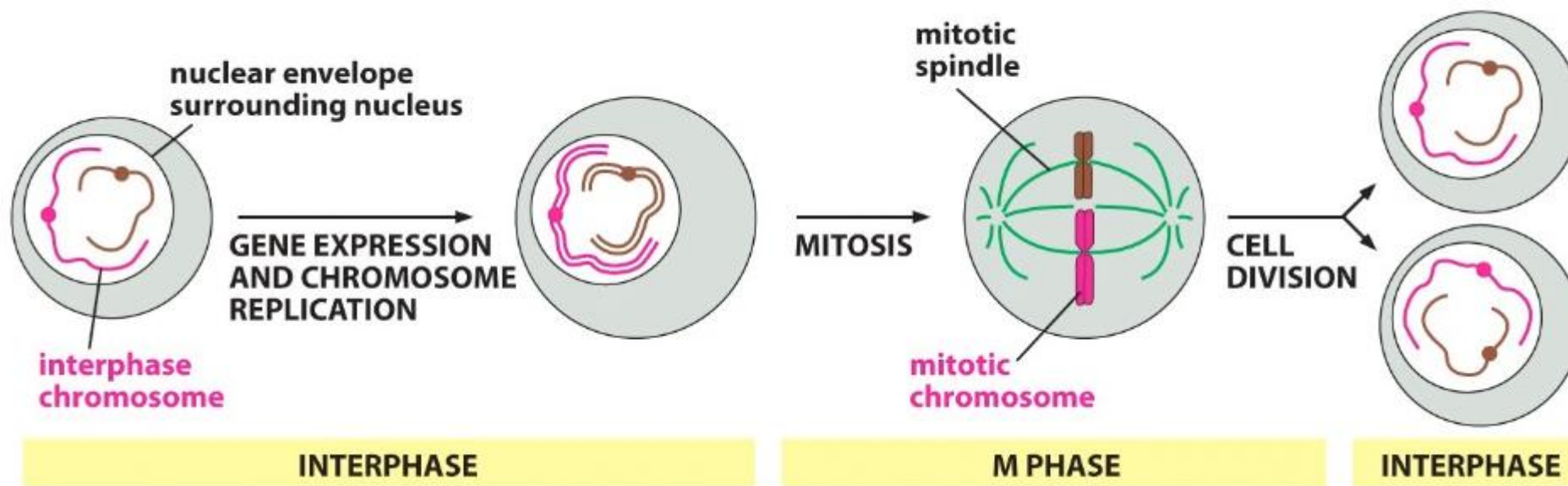
Isso equivale a empacotar 40km de fio dentro de uma bola de tênis!!

Como empacotar DNA no núcleo?

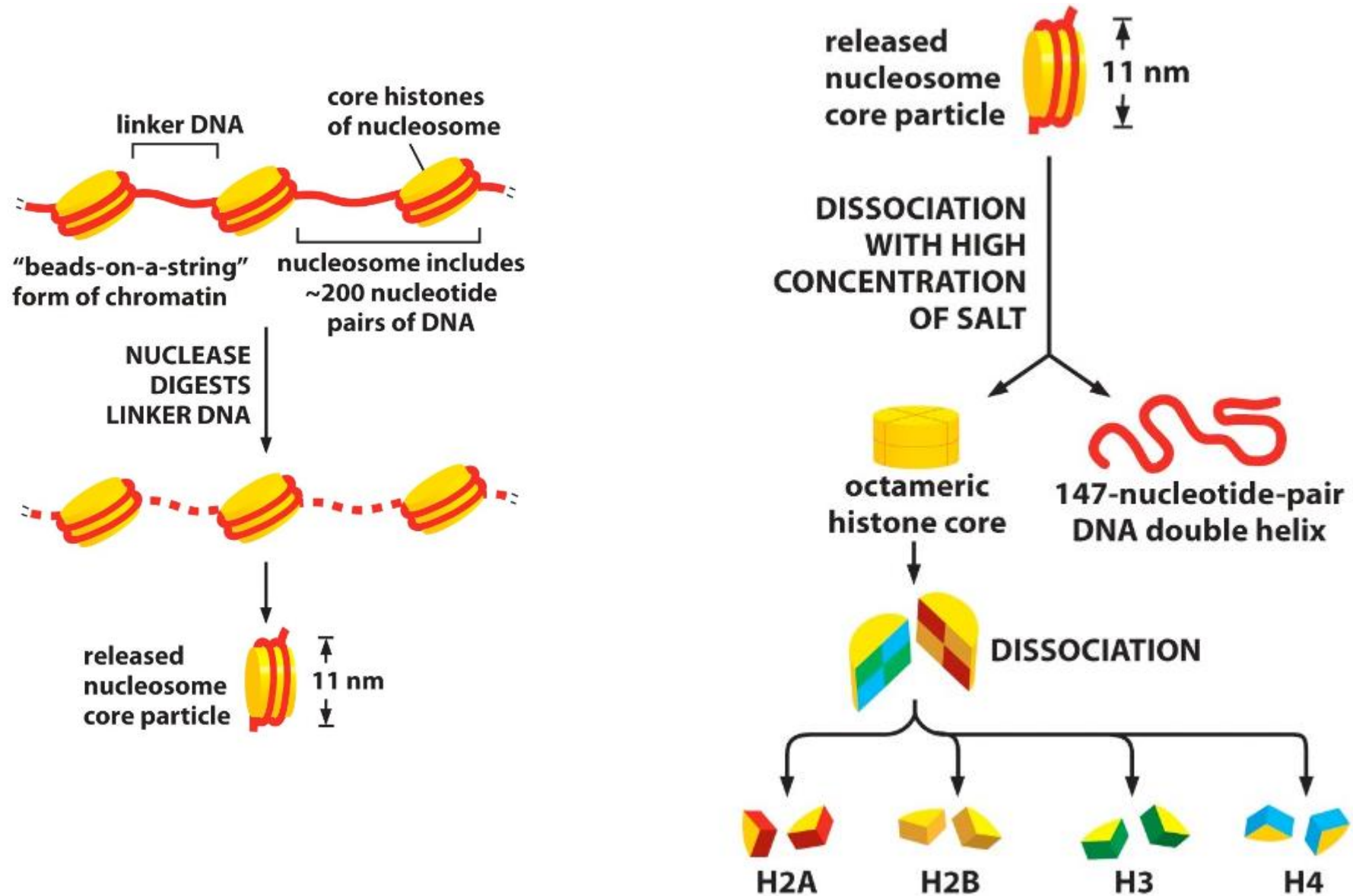


NET RESULT: EACH DNA MOLECULE HAS BEEN PACKAGED INTO A MITOTIC CHROMOSOME THAT IS 10,000-FOLD SHORTER THAN ITS EXTENDED LENGTH

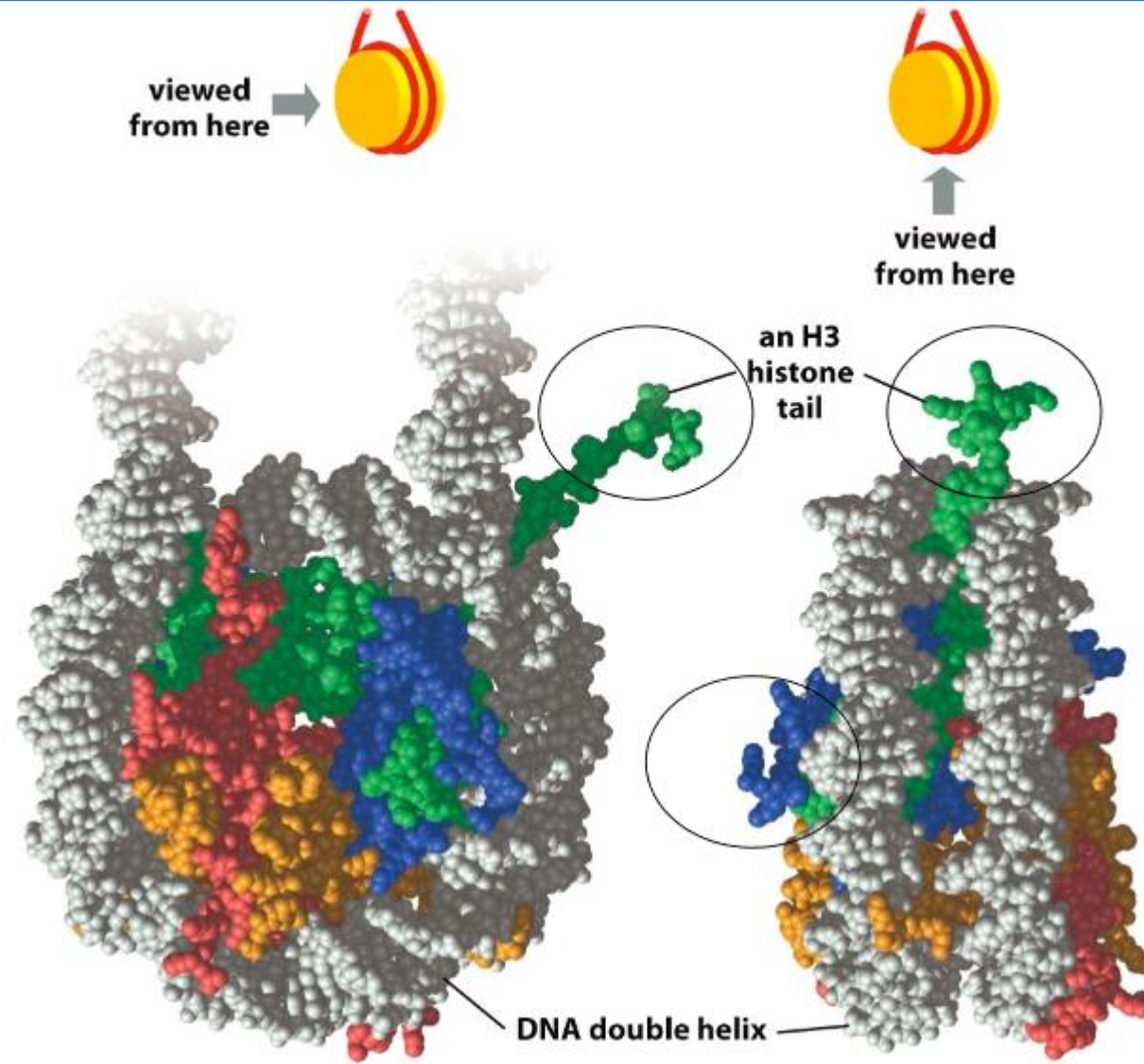
Detalhe: por >99% do tempo, cromossomos NÃO têm forma de “X”



0 nucleosomo



O nucleosomo



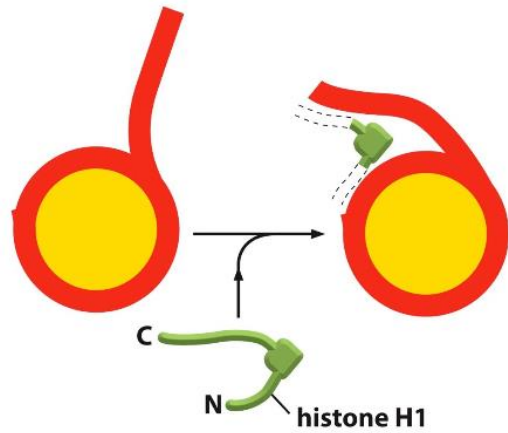
● H2A

● H2B

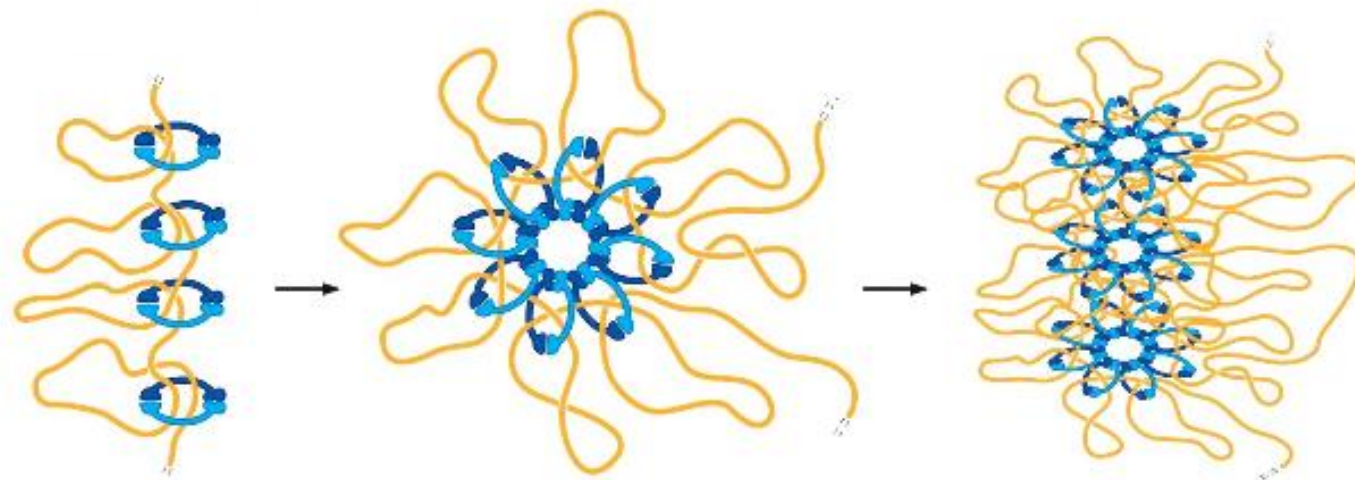
● H3

● H4

Cromatina é mais do que nucleossomo + DNA



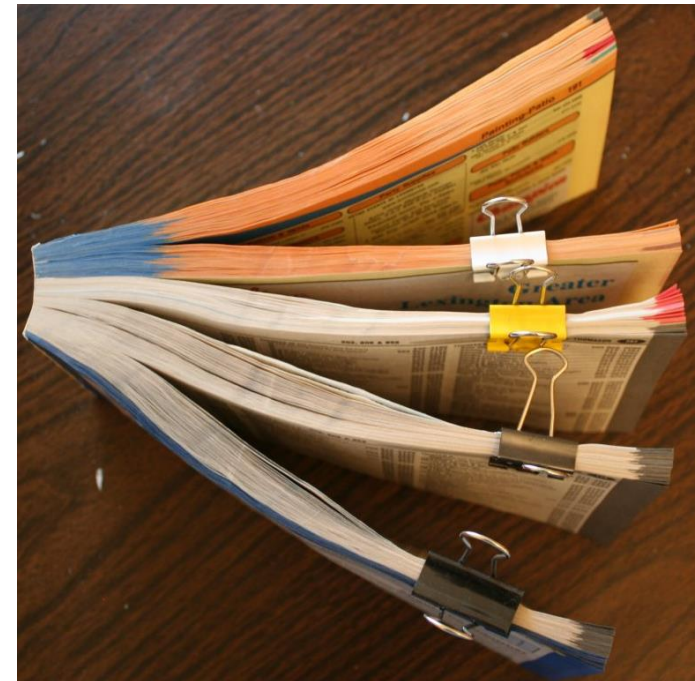
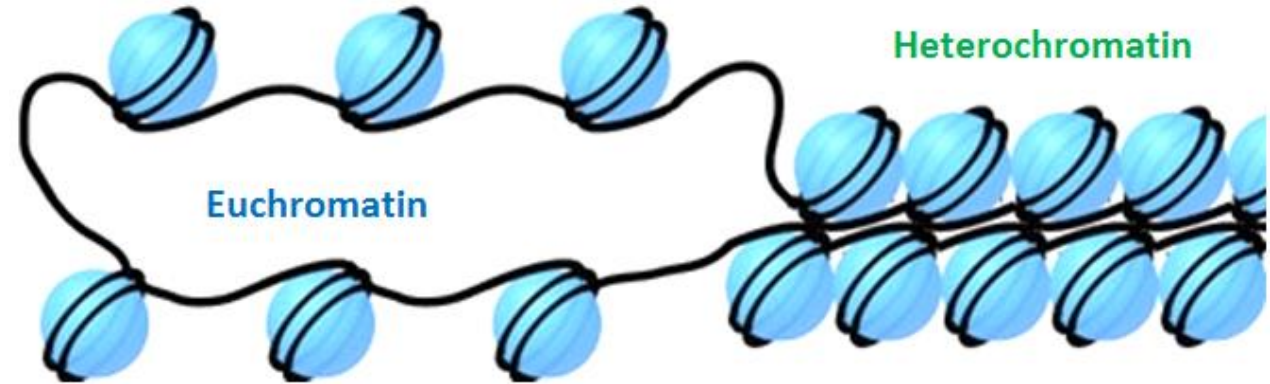
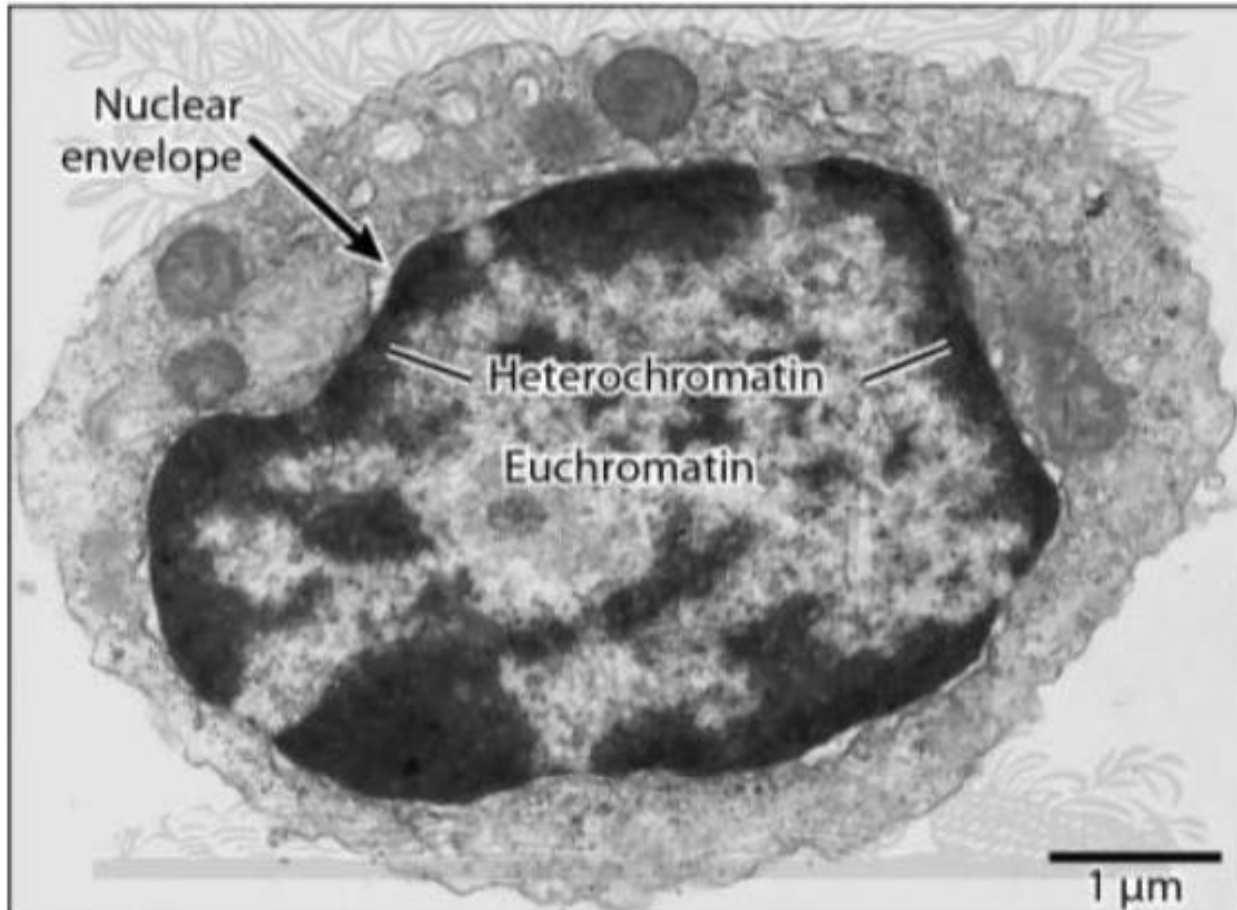
30-nm chromatin fiber of packed nucleosomes



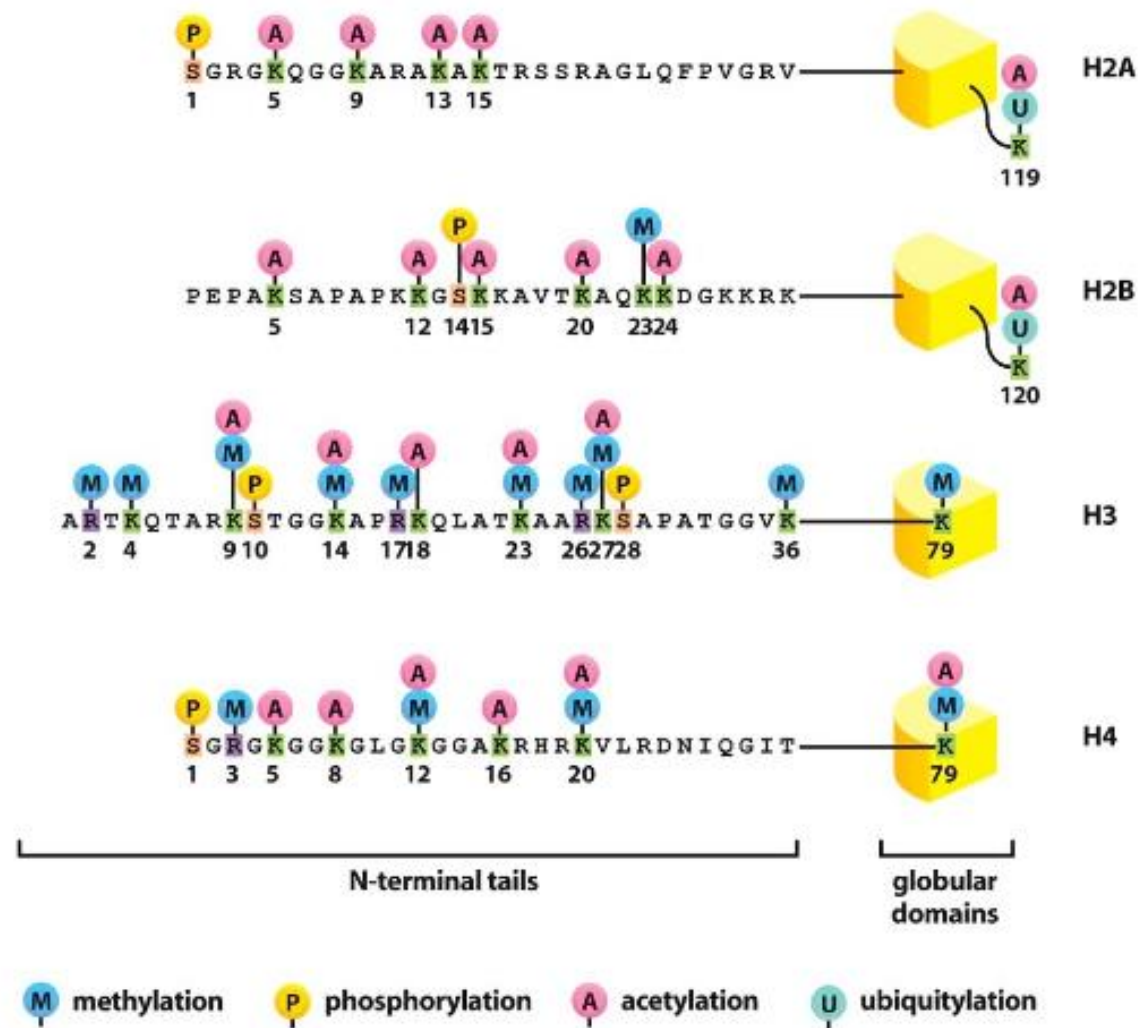
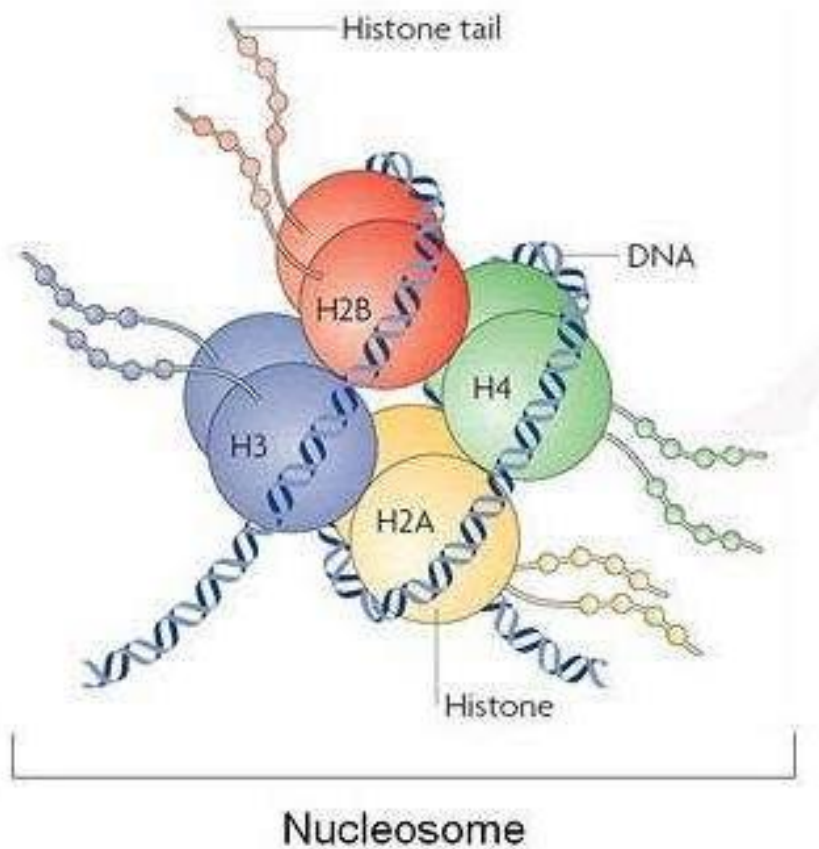


Resolvido o problema?

Heterocromatina e eucromatina



As caudas das histonas são modificadas (código epigenético)

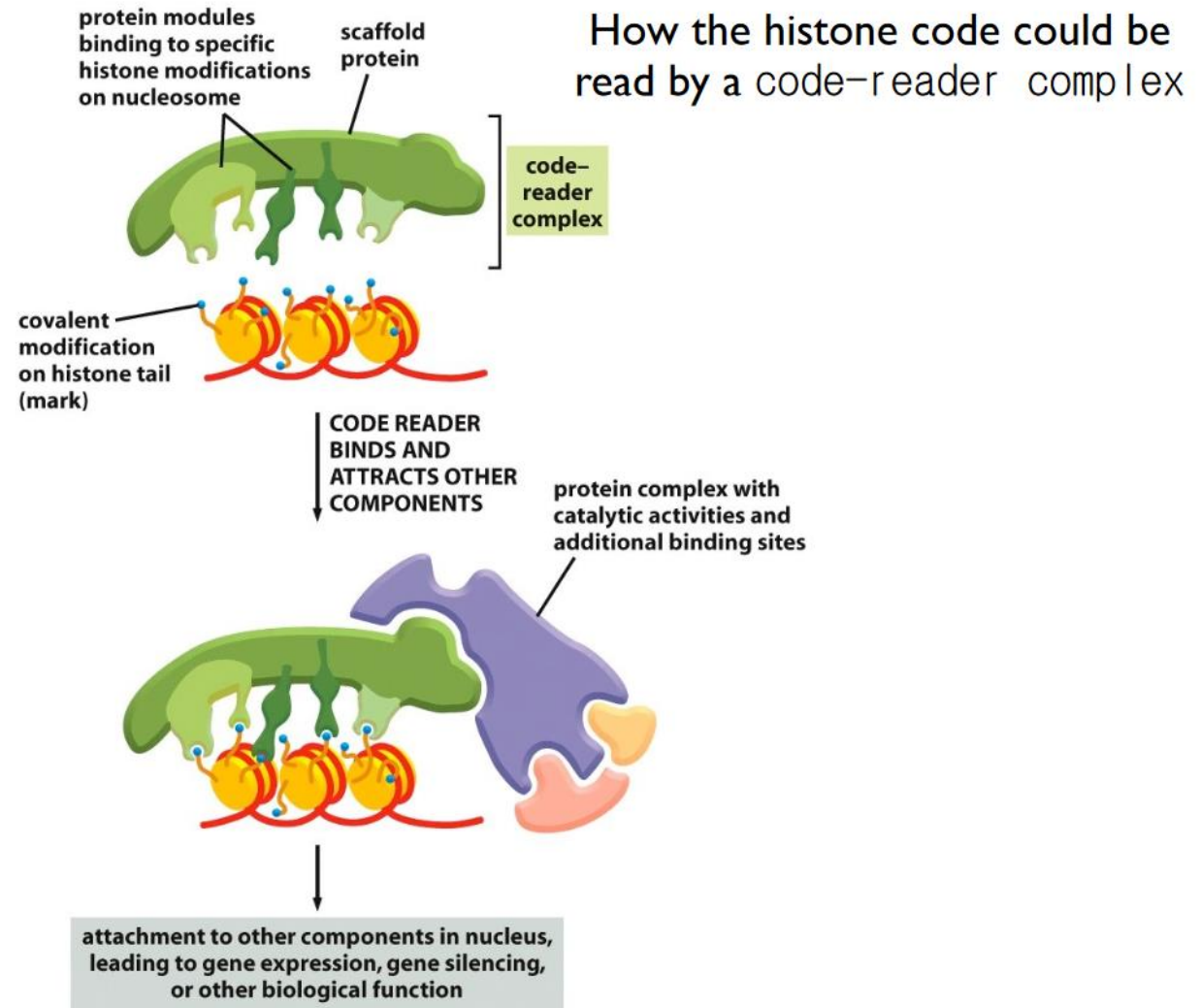


O código epigenético é escrito, lido e apagado

“Writers”

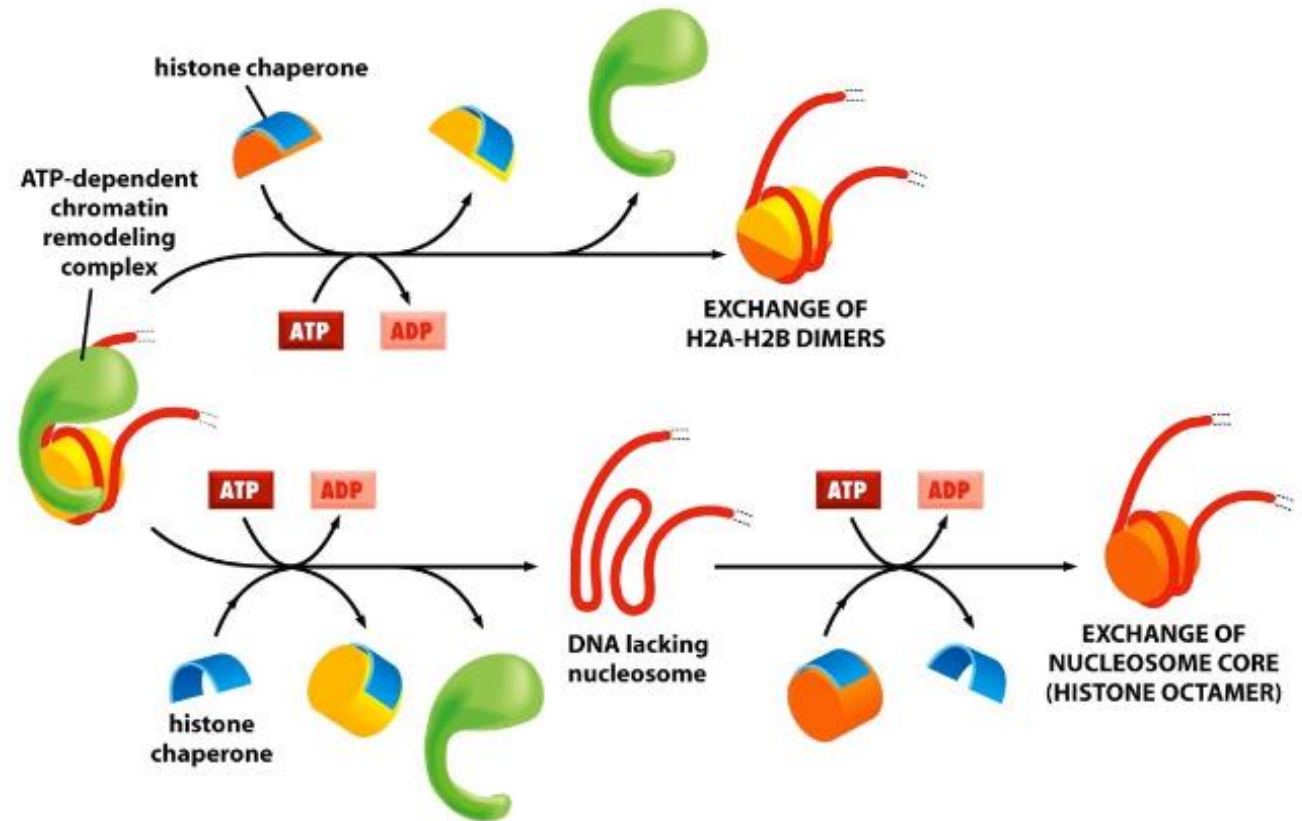
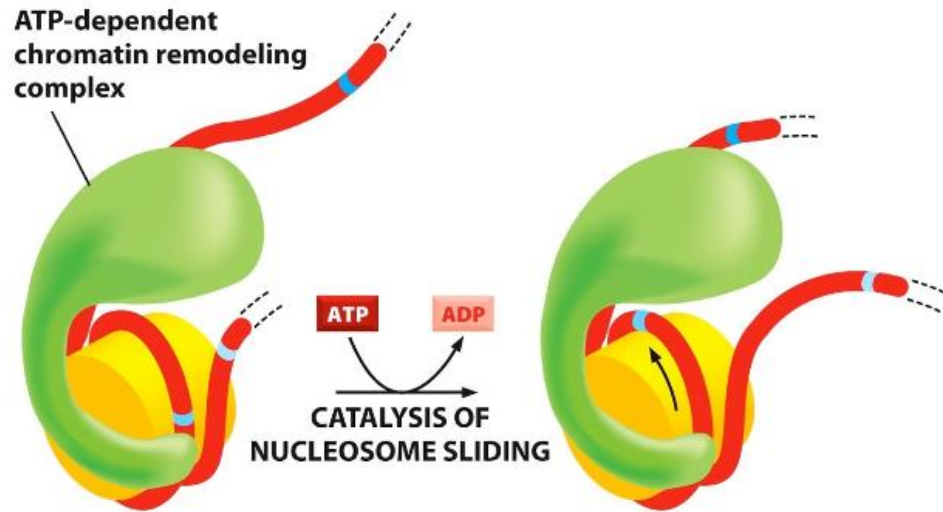
“Erasers”

Ac	<i>Acetyltransferase (HAT)</i>	<i>Deacetylase (HDAC)</i>
Me	<i>Methyltransferase</i>	<i>Demethylase</i>
Ub	<i>Ubiquitylase</i>	<i>Deubiquitylase</i>
Ph	<i>Kinase</i>	<i>Phosphatase</i>

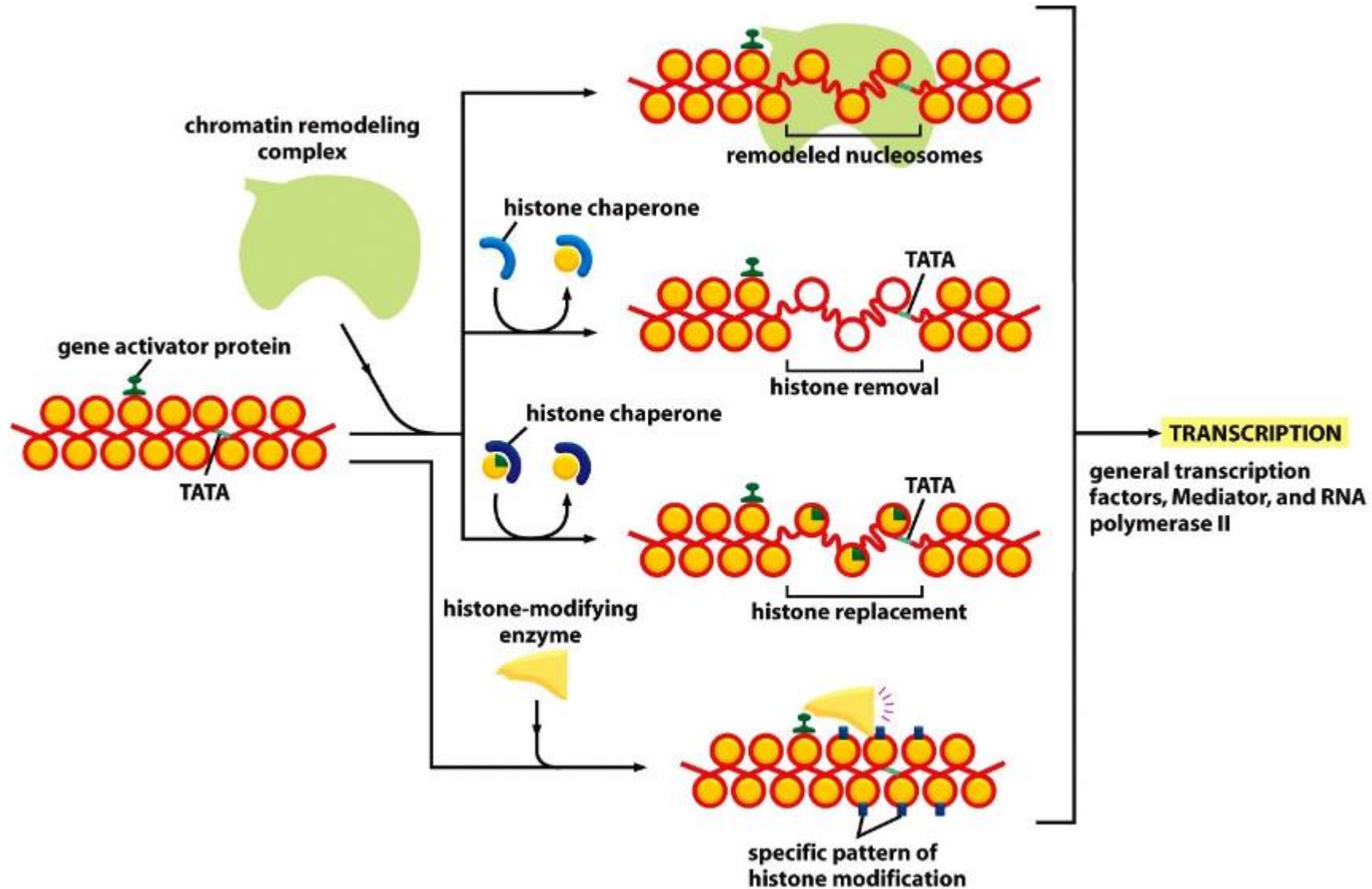


A posição e composição dos nucleosomos é regulada

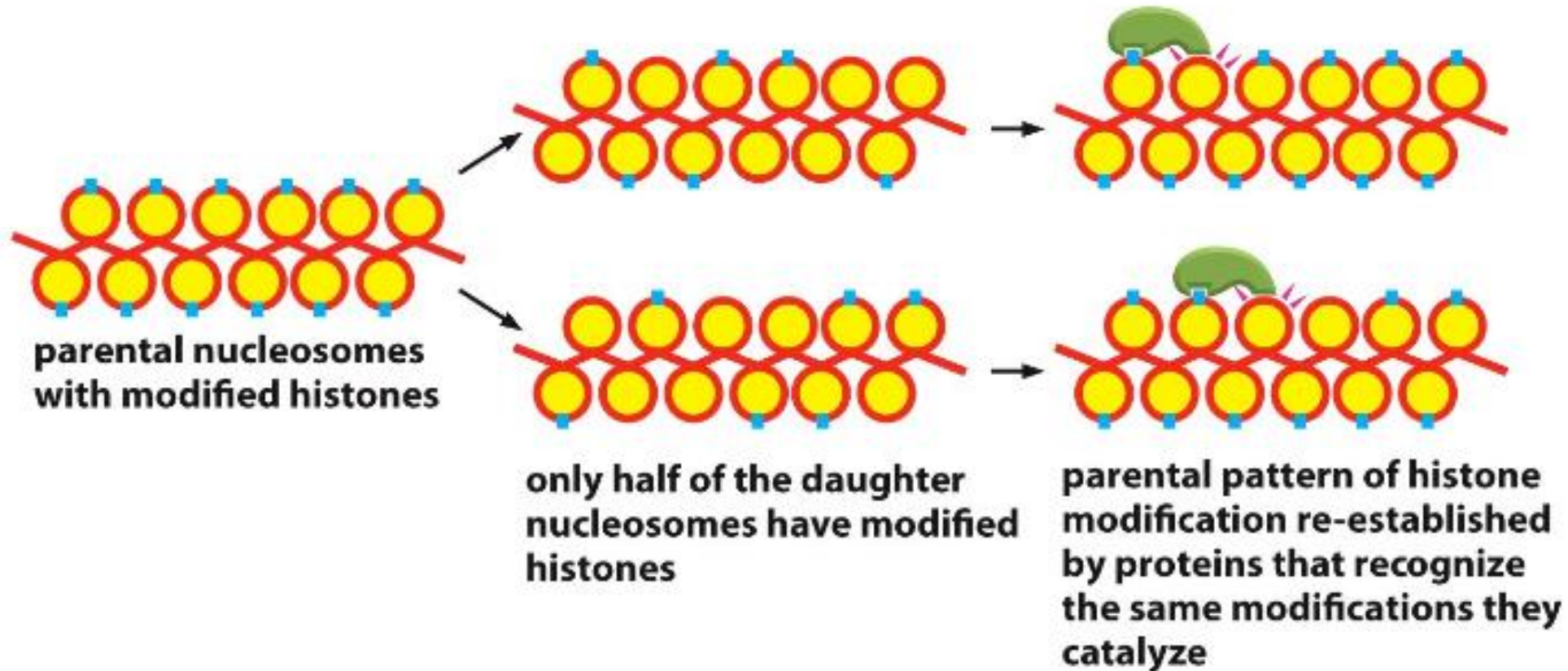
I. Chromatin Remodeling Complexes



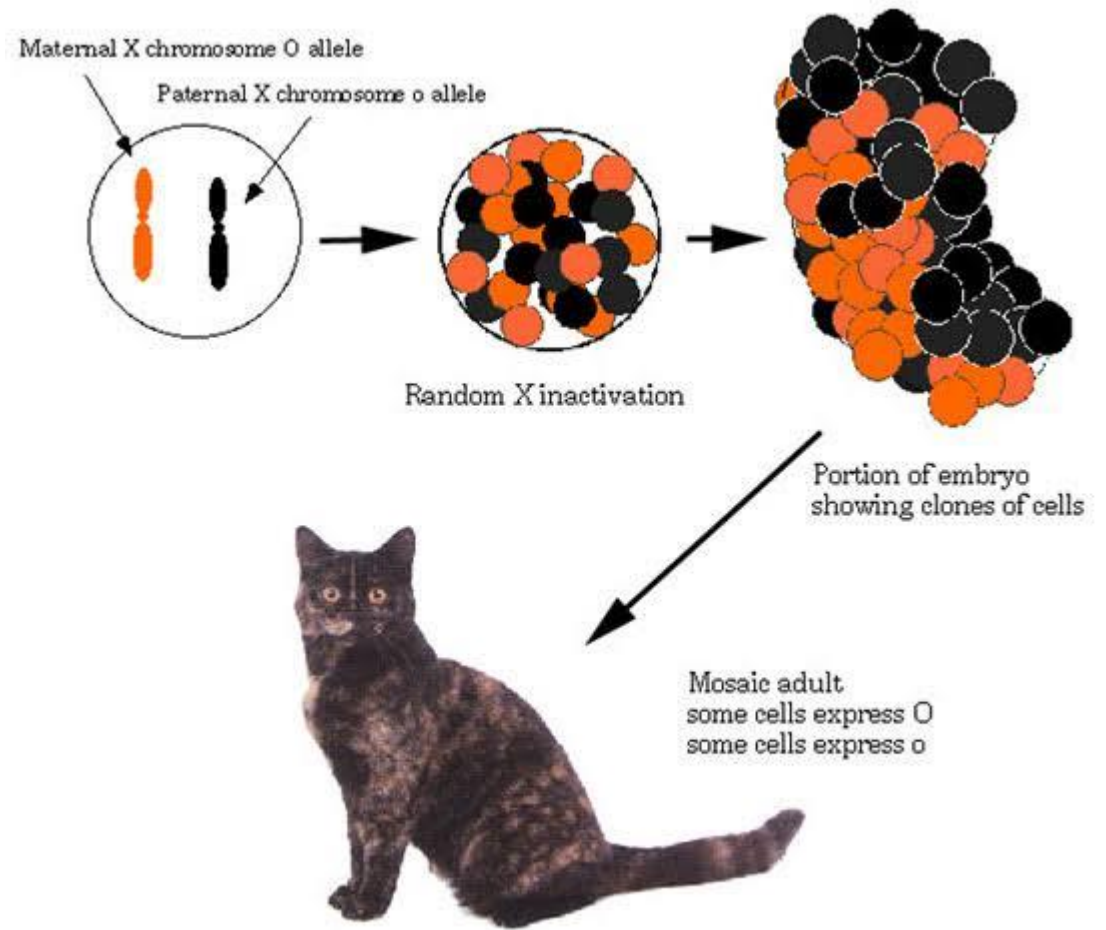
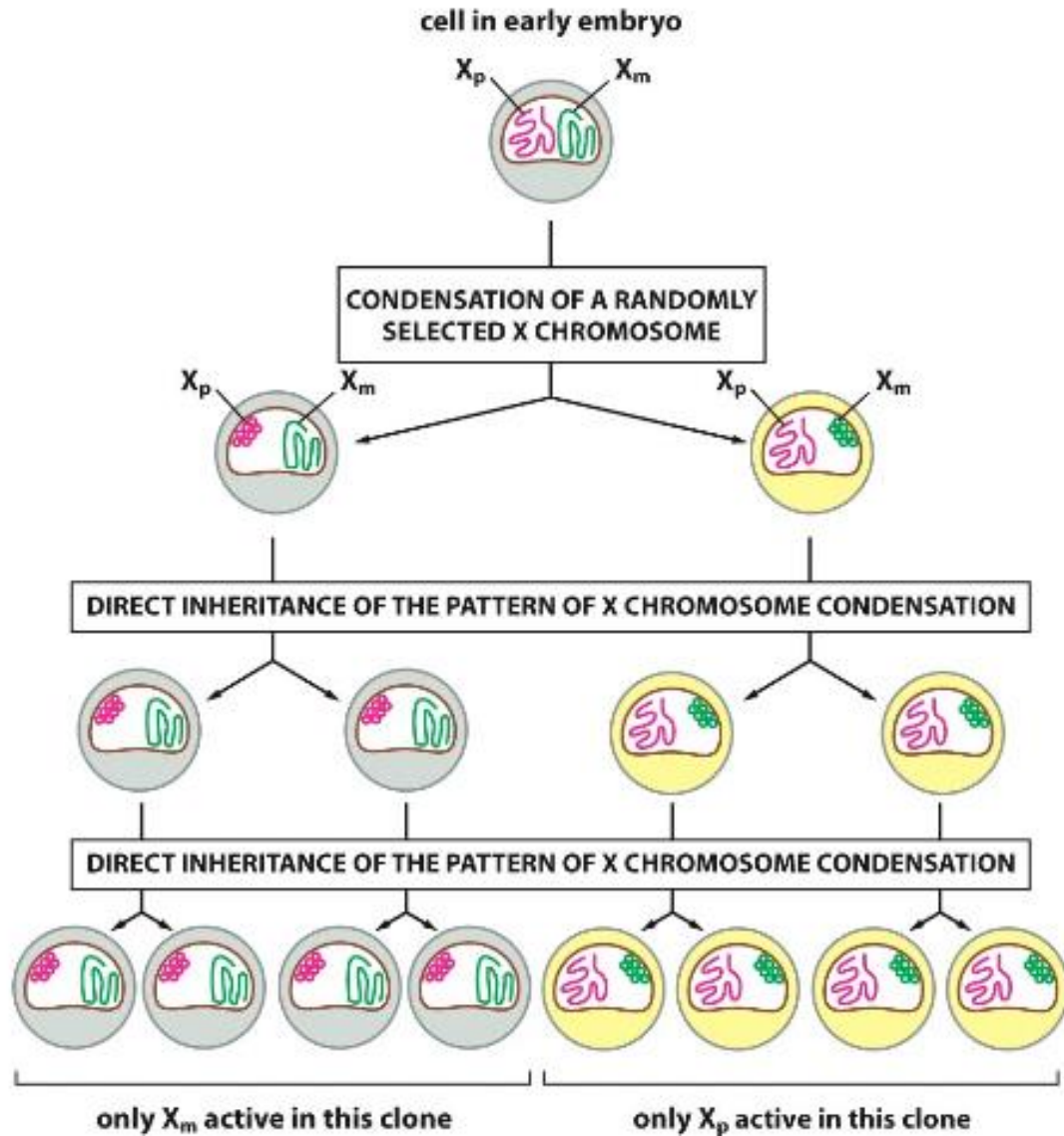
Fatores de transcrição podem ser remodeladores de cromatina



O código epigenético pode ser herdado



O exemplo do cromossomo X



O exemplo dos gêmeos monozigóticos



Marta



Emma



Ramon



Eurides



Emily



Kate



Skyler



Spencer

Aula que vem – Reparo de DNA

