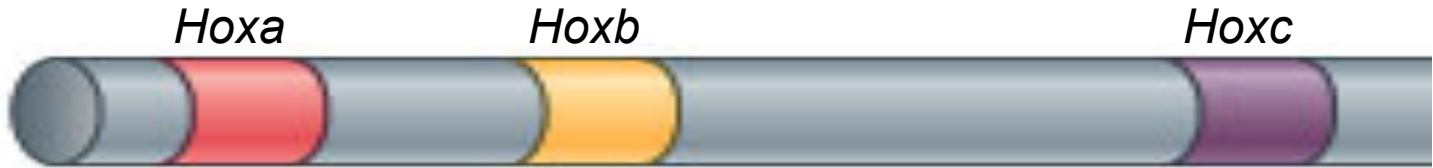
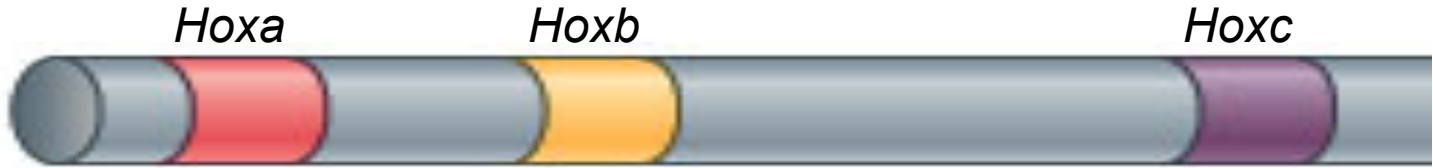


Let's nail down Hox genes



In time, indicate when each of the Hox genes are expressed



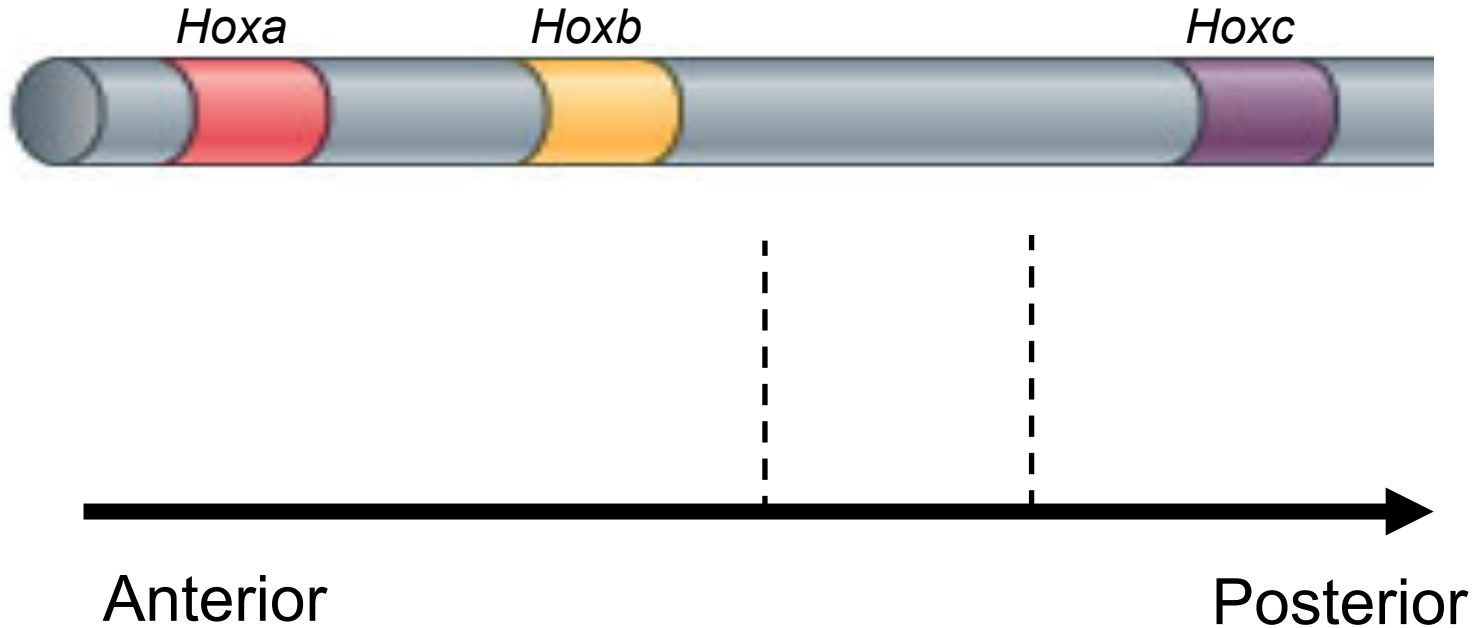
Time

Hox genes are activated in the order that they appear on the chromosome

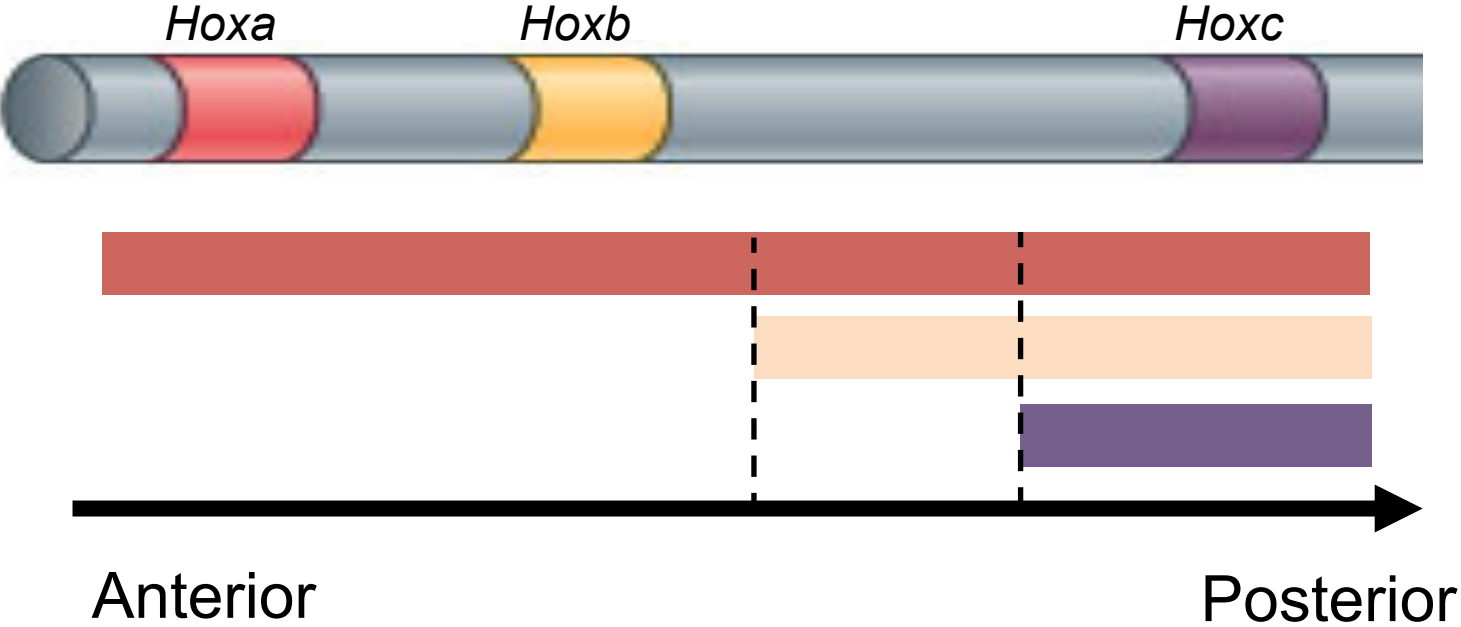


Time

Where are Hox genes initially expressed?



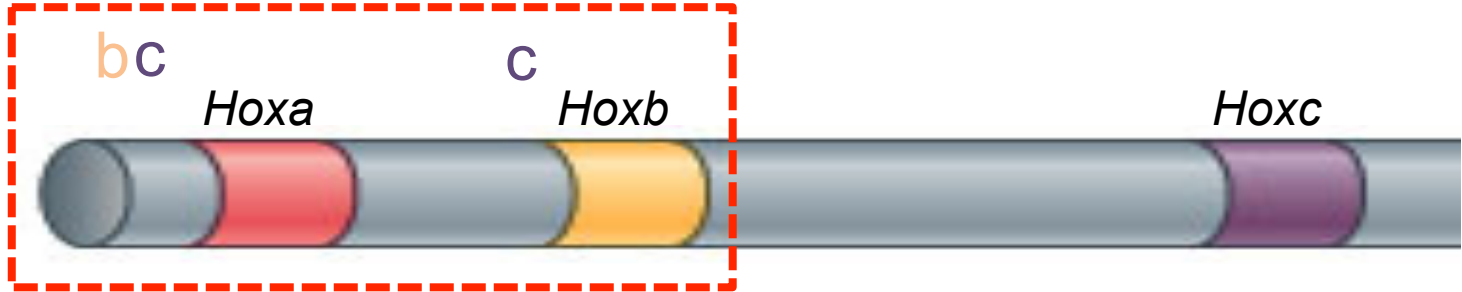
Initially, the anterior boundary of Hox gene expression is set by other transcription factors. The posterior end is not yet resolved.



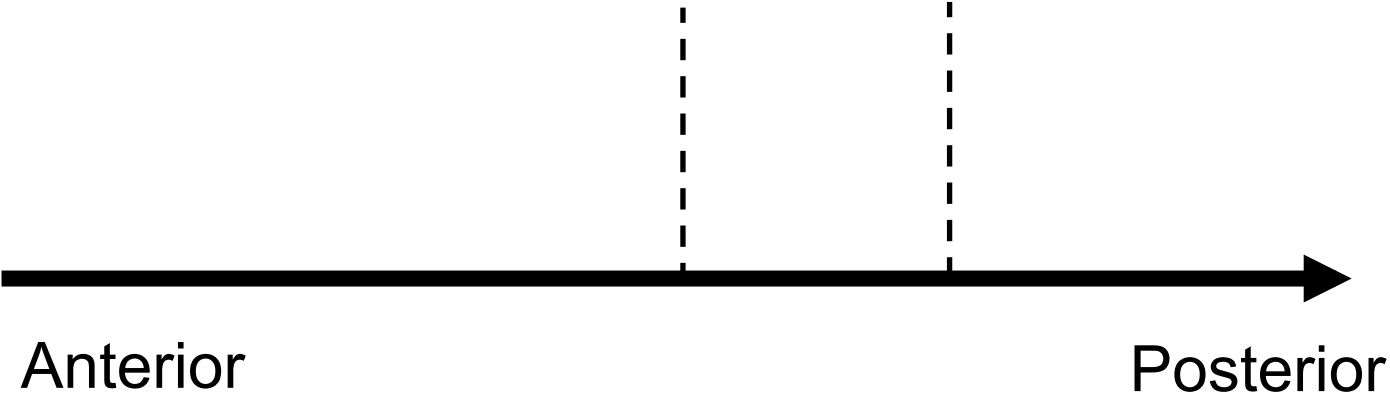
Where do Hox genes bind?



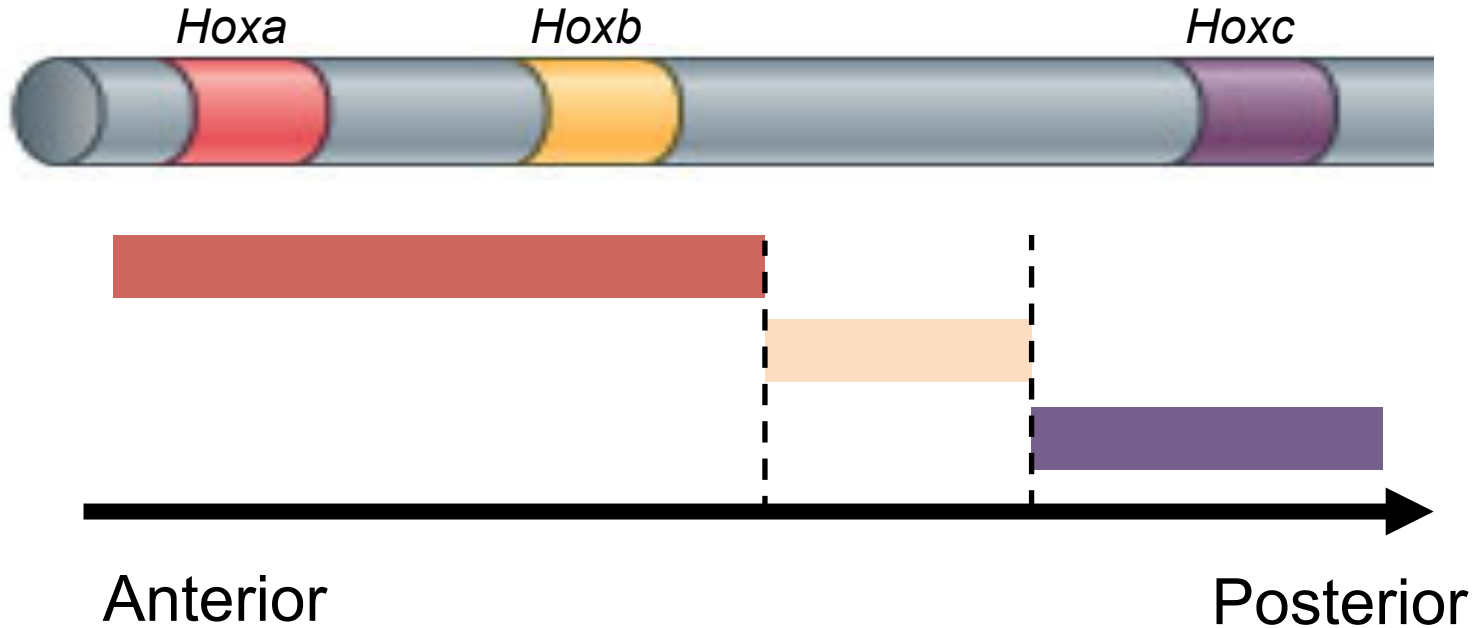
Where do Hox genes bind?



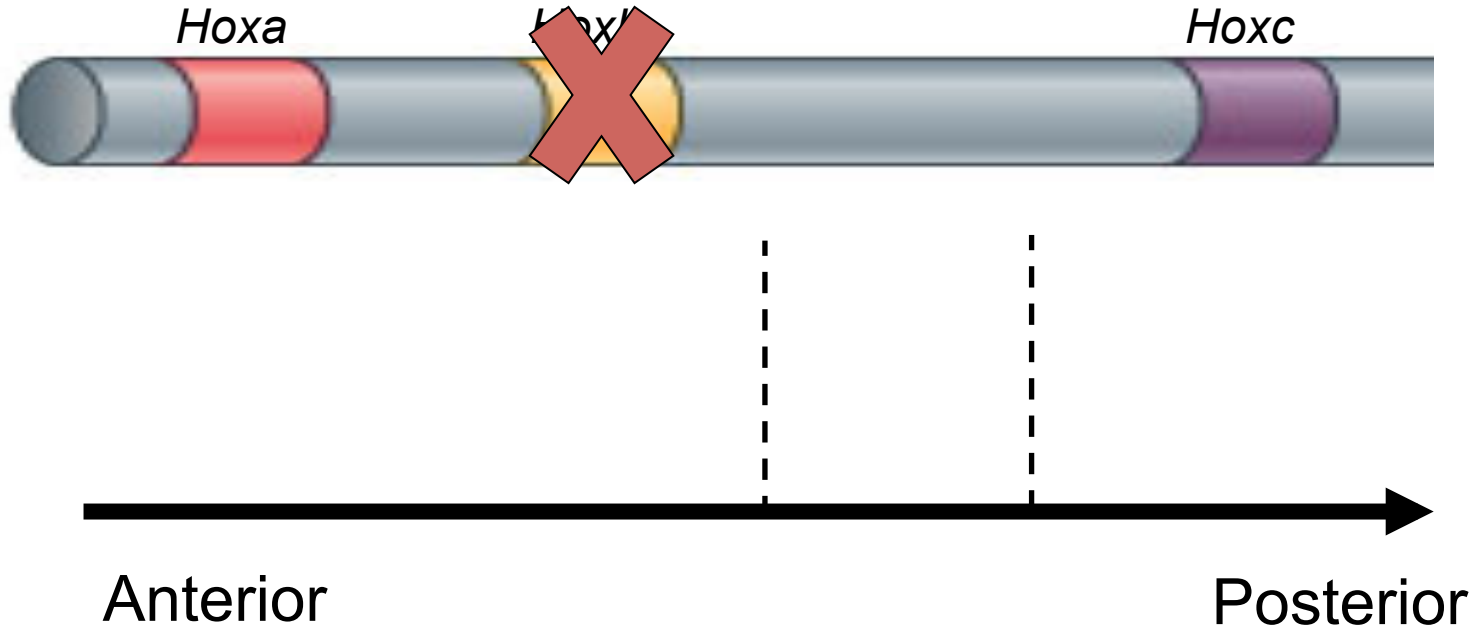
Once Hox proteins are present, where are the Hox genes expressed?



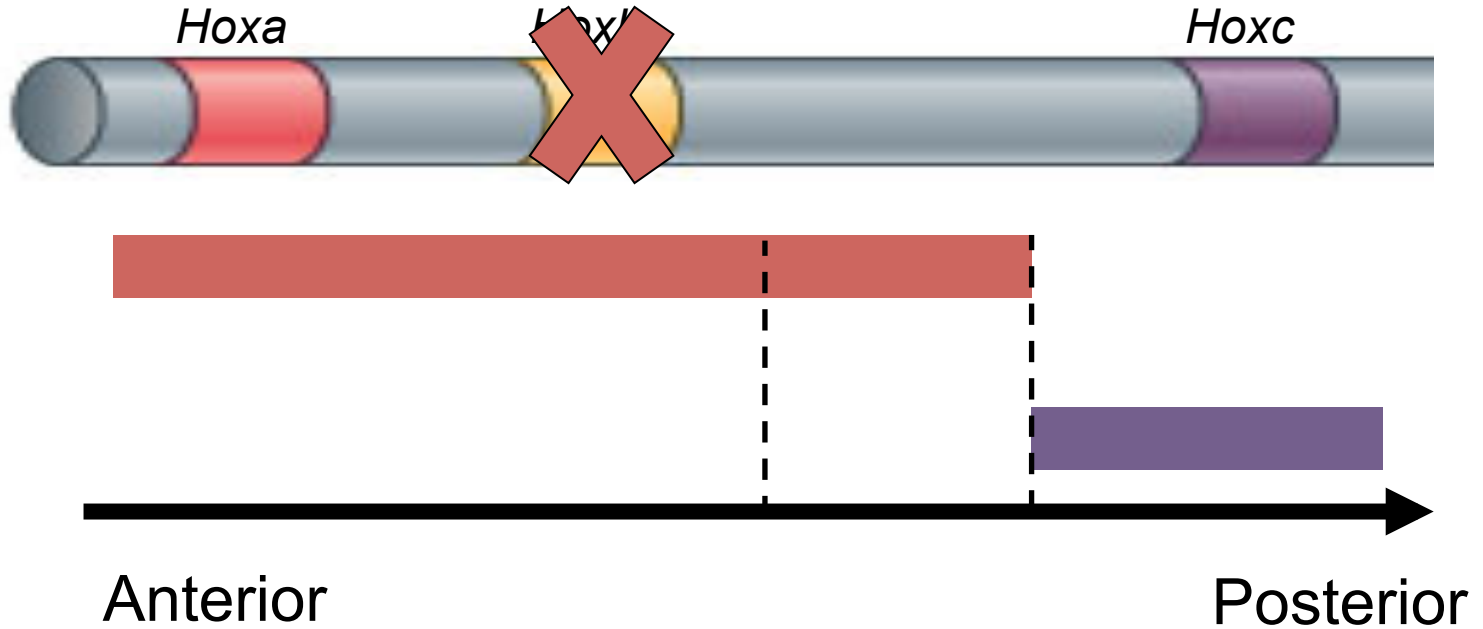
With Hox proteins present, draw the mRNA distribution of each gene.



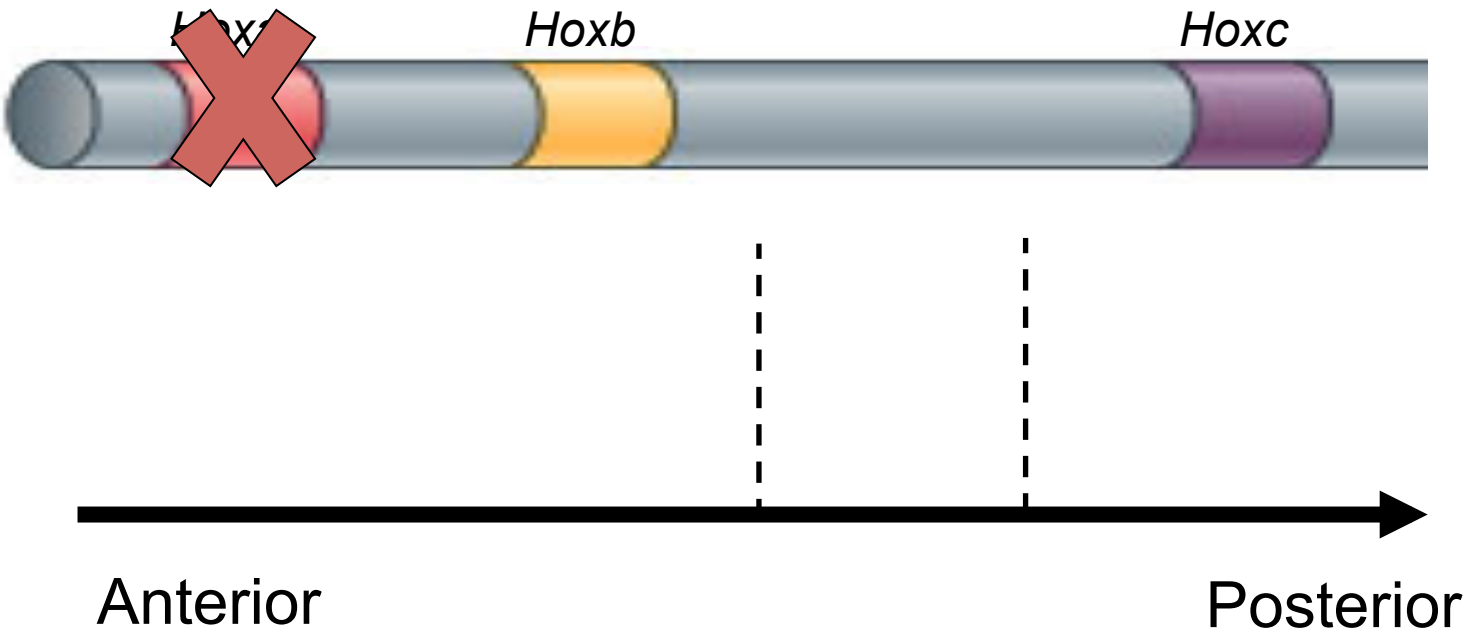
Hoxb is deleted. Draw the distribution of Hox gene mRNA.



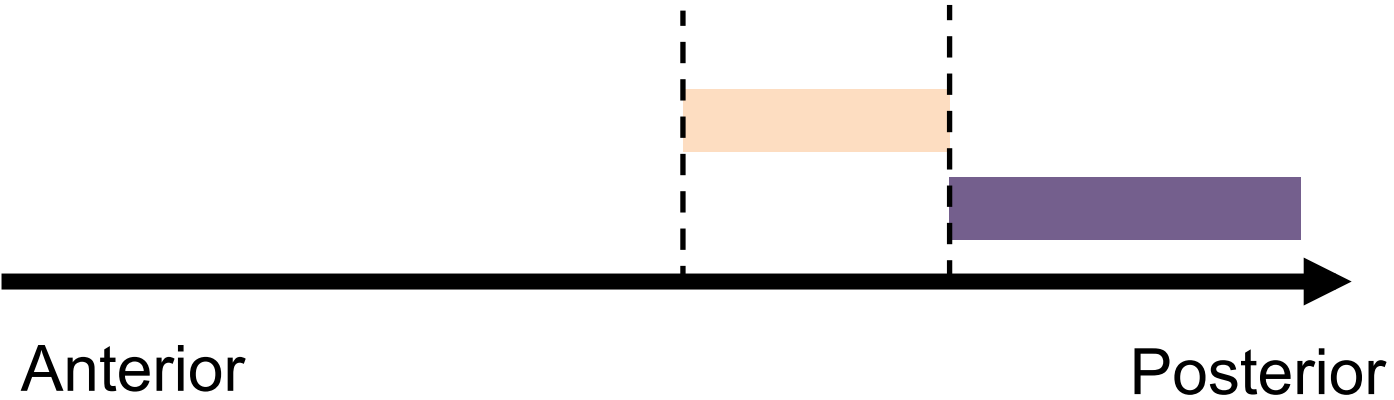
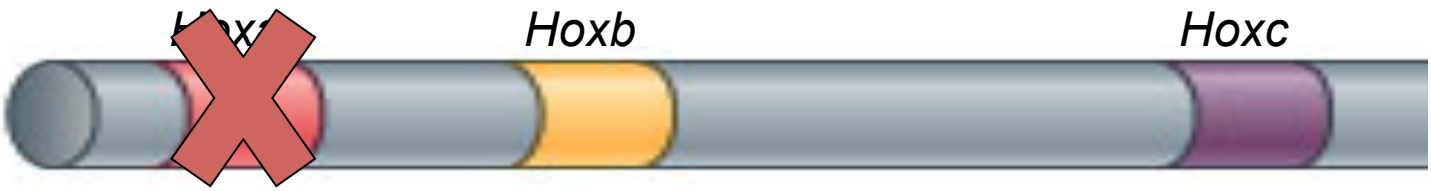
The posterior boundary for *Hoxa* is gone.



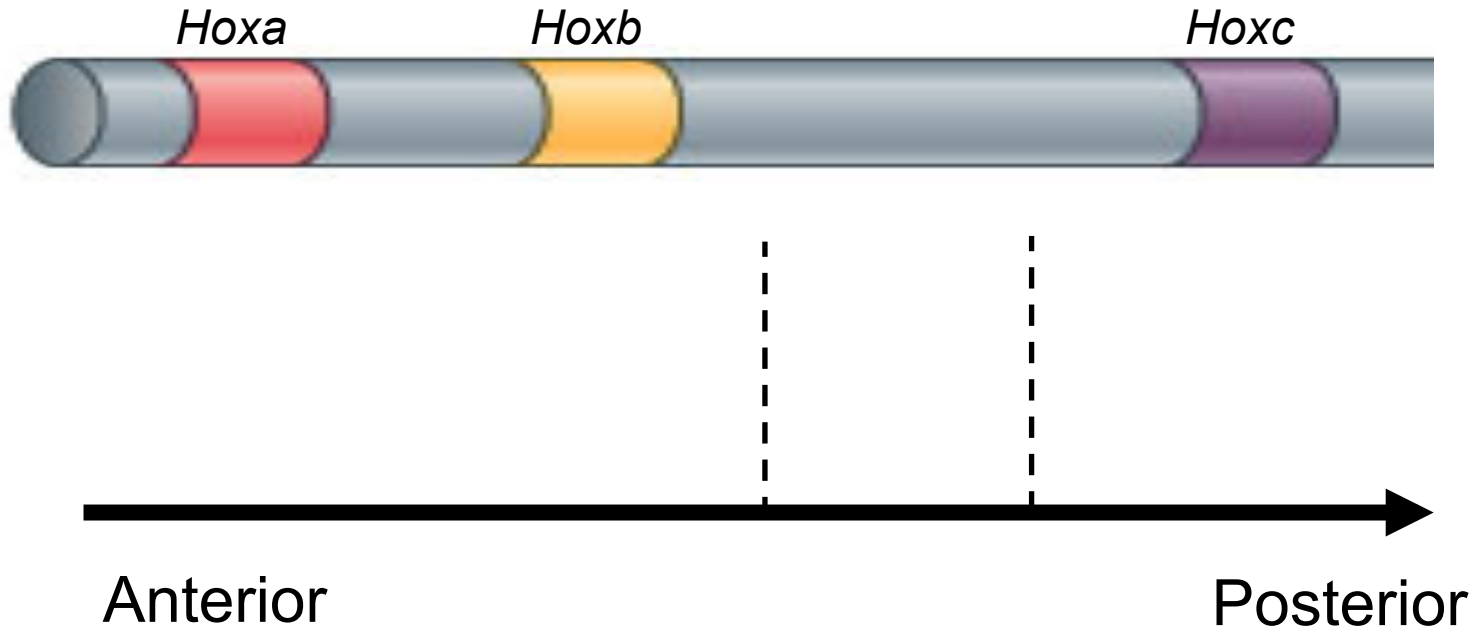
Hoxb is deleted. Draw the distribution of Hox gene mRNA and indicate the identity of the anterior most segment.



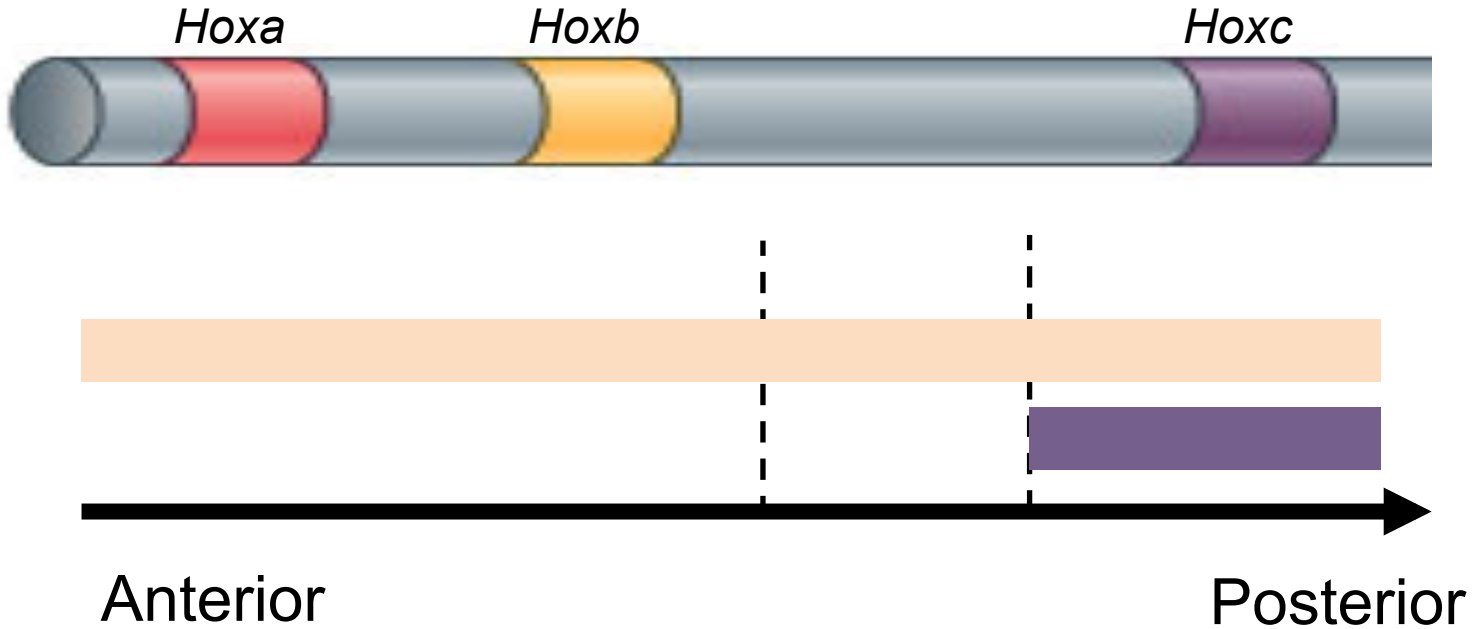
Hoxb is deleted. Draw the distribution of Hox gene mRNA and indicate the identity of the anterior most segment.



What happens to Hox gene mRNA distribution if you force expression of *Hoxb* throughout the embryo?



Hoxb suppresses Hoxa.



Gain of function and loss of function mutations

Don't get hung up on dominant vs recessive.

Haploinsufficiency is not gain of function.

Extra-embryonic vs embryonic

Does a totipotent stem cell have all of the properties of a pluripotent stem cell?

Where do pluripotent stem cells come from (what cell type)?