

Chapter 15: Controls over Genes

Why do Genes need Control?

- Every _____ in your body has the same set of _____
- Any given cell will only use a small _____ of these genes
 - You don't want _____ cells producing saliva or _____
- Even for the genes that a cell _____, the genes will not be used _____
- The genes need to be turned _____ & _____ by the cell

Some Methods of Control

- Controls can be *positive* (_____) or *negative* (_____)
 - Enhancing proteins may cause a gene to be _____ more _____ based on a _____
 - Repressing proteins may _____ the _____ of a gene
- Gene controls operate in response to _____ changes in the cell or its _____ (including _____)

Possible Points of Control

- _____ control – allowing _____ to a gene
- Transcript _____ control – mRNA is not “_____”
- _____ control – deciding which _____ molecules are used
- _____ control – which _____ are conjugated into _____

Evidence of Gene Control

- Chromosome _____ & _____
 - At certain times, chromosomes form _____ or _____ areas (more _____) where genes are being transcribed
- _____ Inactivations
 - In females, one X chromosome in each cell is _____ shut down and condenses into a “_____ body” during embryo _____
 - This can lead to a _____ effect in tissues of females

Gene Control in Prokaryotes

- The first gene control studies were done on _____ (intestinal bacteria) and their digestion of _____
- A series of _____ genes, preceded by a _____ region and an *operator* makes up the “_____”
 - The operator is a _____ site for a _____ protein
- A _____ control keeps the *e. coli* from using the genes _____
- If there is no _____ present in the intestine, a repressor protein attaches to the _____
 - The gene cannot then be _____
- When lactose is present, the _____ binds to the repressor and changes its _____
 - The _____ can then be transcribed