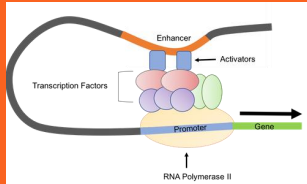
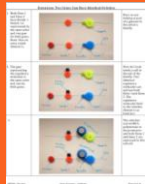
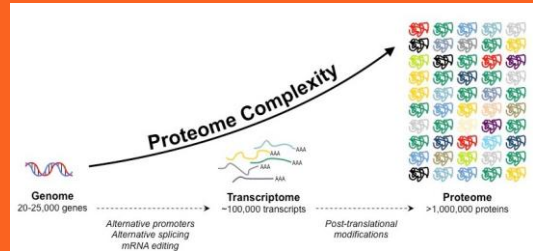


6.6 Gene Expression and Cell Specialization



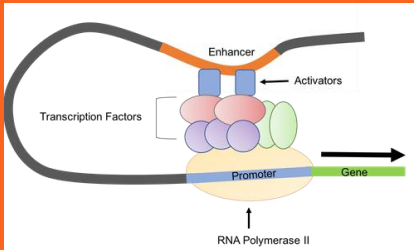
ENDURING UNDERSTANDING

IST-2 Differences in the expression of genes account for some of the phenotypic differences between organisms.



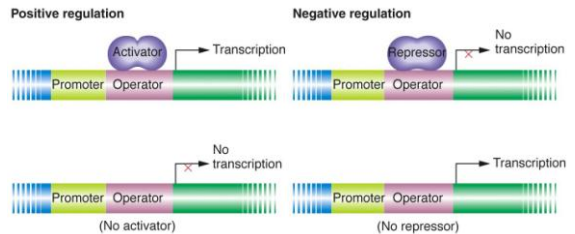
IST-2.C Explain how the binding of transcription factors to promoter regions affects gene expression and/or the phenotype of the organism.

- Promoters are DNA sequences upstream of the transcription start site where RNA polymerase and transcription factors bind to initiate transcription.



IST-2.C Explain how the binding of transcription factors to promoter regions affects gene expression and/or the phenotype of the organism.

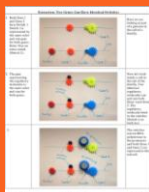
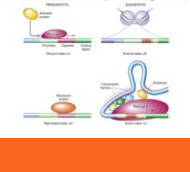
- Negative regulatory molecules inhibit gene expression by binding to DNA and blocking transcription.



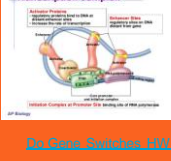
IST-2.D Explain the connection between the regulation of gene expression and phenotypic differences in cells and organisms

- Gene regulation results in differential gene expression and influences cell products and function.
 - Gene Switches and enhancers use regulatory molecules to allow gene to be on in some tissue and off in others.

Overview of transcriptional regulation

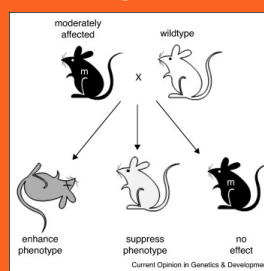


Transcription complex



IST-2.D Explain the connection between the regulation of gene expression and phenotypic differences in cells and organisms

- Gene regulation accounts for some of the phenotypic differences between organisms with similar genes.



IST-2.D Explain the connection between the regulation of gene expression and phenotypic differences in cells and organisms

□ Certain small RNA molecules have roles in regulating gene expression.

— Small Regulatory RNAs (sRNA)

- siRNA (silence by interfering, doublestranded)
- miRNA (silence by repression or degrading)

