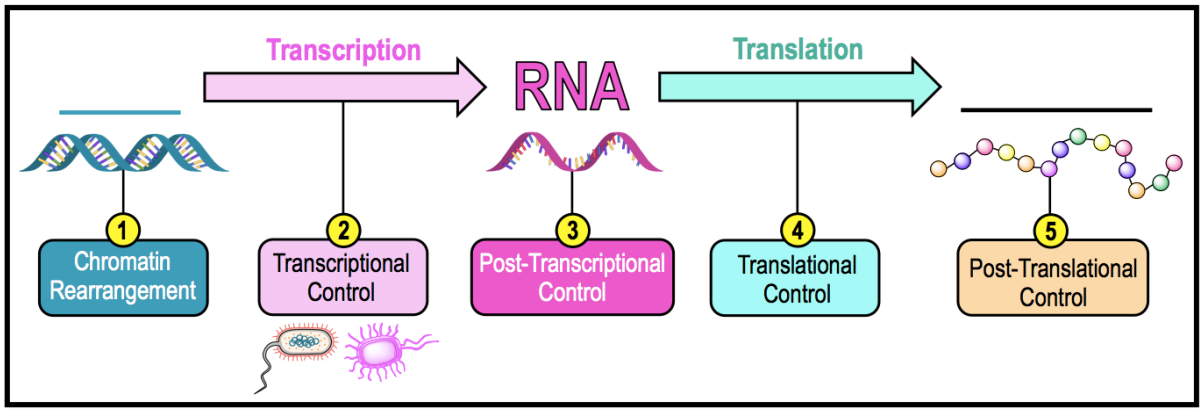
CONCEPT: INTRODUCTION TO REGULATION OF GENE EXPRESSION

- Prokaryotic & eukaryotic cells both have the ability to *regulate* (or *control*) their **gene** _____.
- *Gene expression* can be controlled at any of _____ stages:
  1. _____ **Rearrangements:** regulates chromatin conformation & DNA's accessibility for transcription.
  2. _____ **Control:** regulates RNA polymerase binding to a promoter & initiation of transcription.
     - □ Most _____ gene regulation occurs via *transcriptional control*.
  3. _____**-Transcriptional Control:** regulates modifications to RNA *after* transcription.
  4. _____ **Control:** regulates initiation & elongation steps of translation.
  5. _____**-Translational Control:** regulates modifications to proteins *after* translation.

EXAMPLE: 5 Stages Regulating Gene Expression.

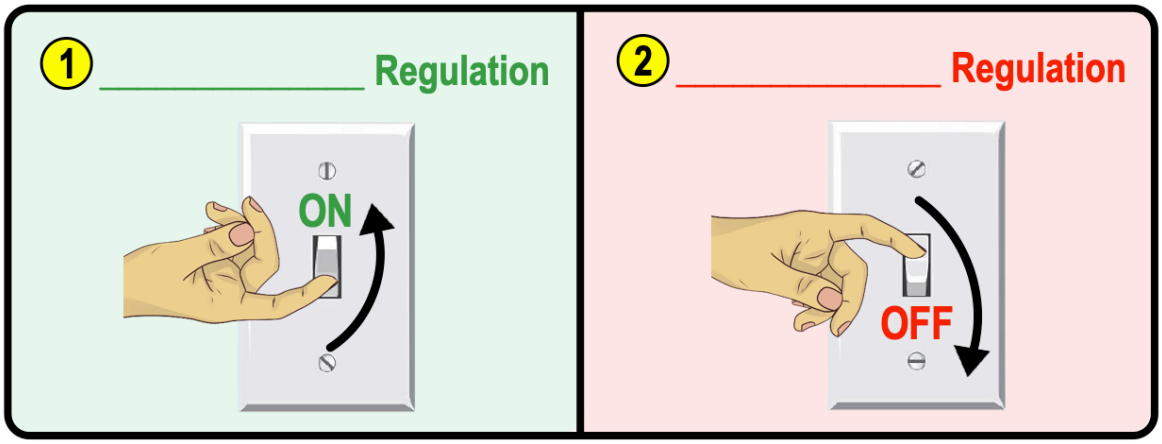


- _____ gene regulation can occur at any of these 5 stages.

Positive vs Negative Gene Regulation

- Cells regulate gene expression in ___ ways:
  1. **Positive Regulation:** *stimulates gene* expression by turning "_____" the gene.
  2. **Negative Regulation:** *prevents* gene expression by turning "_____" the gene.

EXAMPLE: Positive & Negative Regulation of a Gene Resembles a "Light Switch."



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PRACTICE: Post-translational control refers to:

a) Regulation of gene expression after transcription.
b) Regulation of gene expression after translation.
c) Control of epigenetic activation.
d) Period between transcription and translation.

PRACTICE: Which of the following is an example of positive regulation of gene expression?

a) Transcription is halted on a specific gene to limit the amount of protein being created by the gene's expression.
b) The protein that is translated is immediately degraded by the cell before it can serve its function.
c) Elongation of translation comes to a stop and the ribosome dissociates when a regulatory protein binds.
d) A protein binds to DNA and then stimulates the initiation of transcription of a specific gene.

PRACTICE: In prokaryotes, control of gene expression usually occurs at the

a) Splicing of pre-mRNA into mature mRNA.
b) Post-translational control level.
c) Transcriptional control level.
d) All of the above.