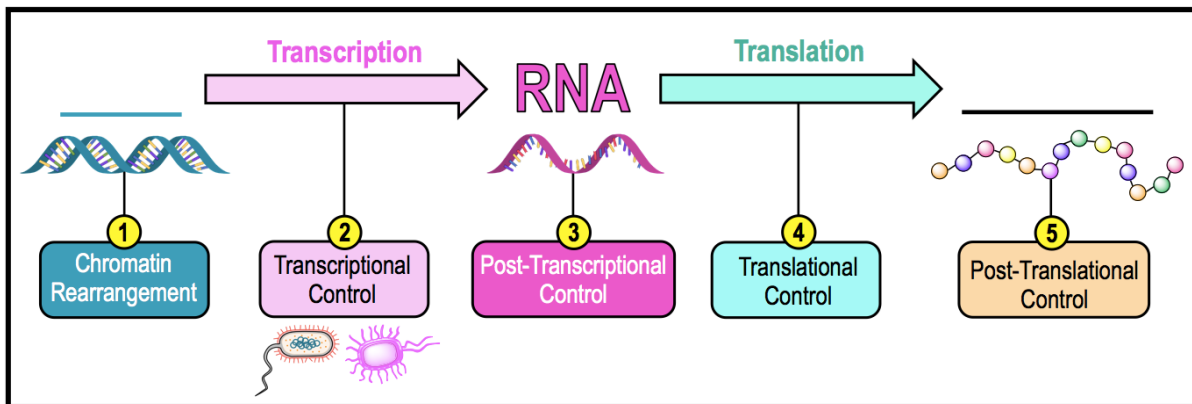


## CONCEPT: INTRODUCTION TO REGULATION OF GENE EXPRESSION

- 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.

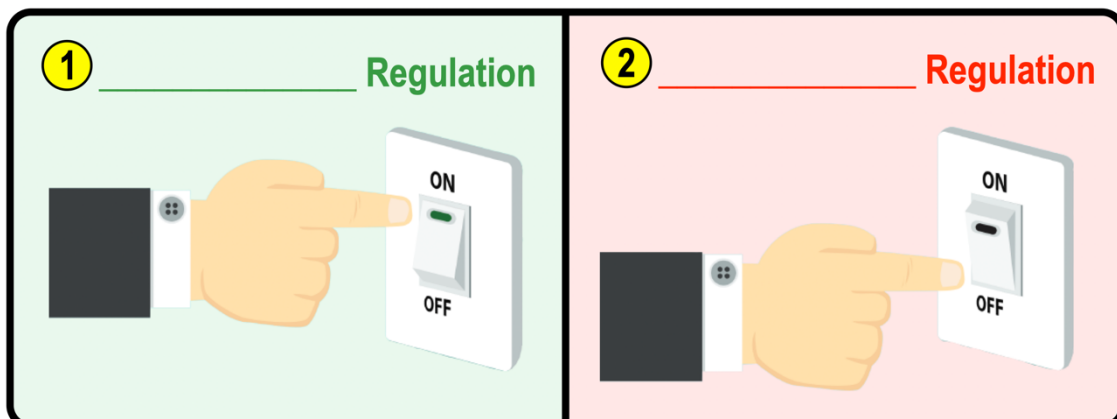


- \_\_\_\_\_ gene regulation can occur at any of these 5 stages.

## 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."



**CONCEPT: INTRODUCTION TO REGULATION OF GENE EXPRESSION**

**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.