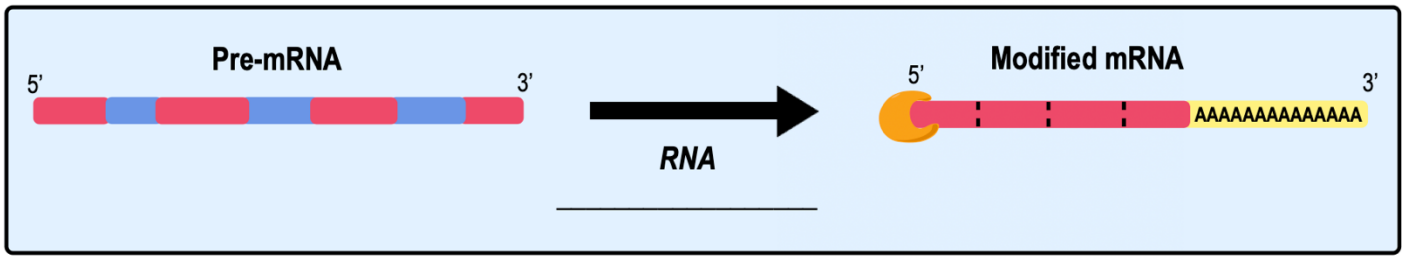
CONCEPT: EUKARYOTIC RNA PROCESSING & SPLICING

●*Recall:* unlike prokaryotic mRNA, _____ mRNA requires further *modification* upon transcription termination.

□ _____**-mRNA**: eukaryotic mRNA *before* modification via *RNA processing* & *splicing*.

□ **RNA Processing & Splicing**: eukaryotic processes converting pre-mRNA into mRNA that's ready for *translation*.



1) RNA Processing

●Eukaryotic RNA processing involves _____ events that alter both ends of the pre-mRNA:

1) Addition of a **5' cap** (modified *guanine* nucleotide) to the _____ end of the pre-mRNA.

2) Addition of a **Poly-_____ Tail** (sequence of *adenine* nucleotides) to the _____ end of the pre-mRNA.

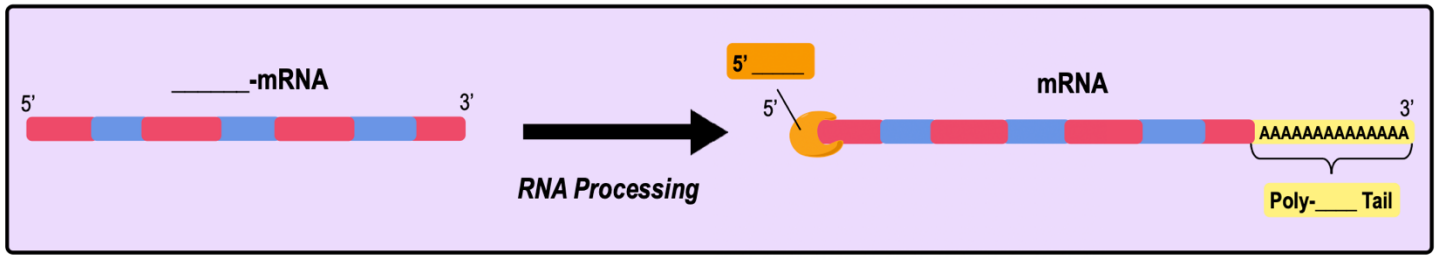
●**5' cap** & **poly-A tail** share several important *functions* including the following:

□ Facilitate _____ of mRNA from the nucleus to the cytoplasm.

□ _____ the mRNA from degradation by enzymes.

□ Help ribosomes _____ to the mRNA for translation.

EXAMPLE: pre-mRNA is processed into a mature mRNA transcript.



PRACTICE: Which of the following processes occurs in eukaryotic gene expression?

a) mRNA, tRNA, and rRNA are translated.

b) A cap is added to the 5' end of the mRNA.

c) Adenine nucleotides are added to the 5' end of the mRNA.

d) RNA polymerase requires tRNA to elongate the molecule.

PRACTICE: An mRNA poly-A tail:

a) Prevents translation.

b) Prevents transcription.

c) Marks the RNA for degradation.

d) Protects the mRNA from degradation.

CONCEPT: EUKARYOTIC RNA PROCESSING & SPLICING

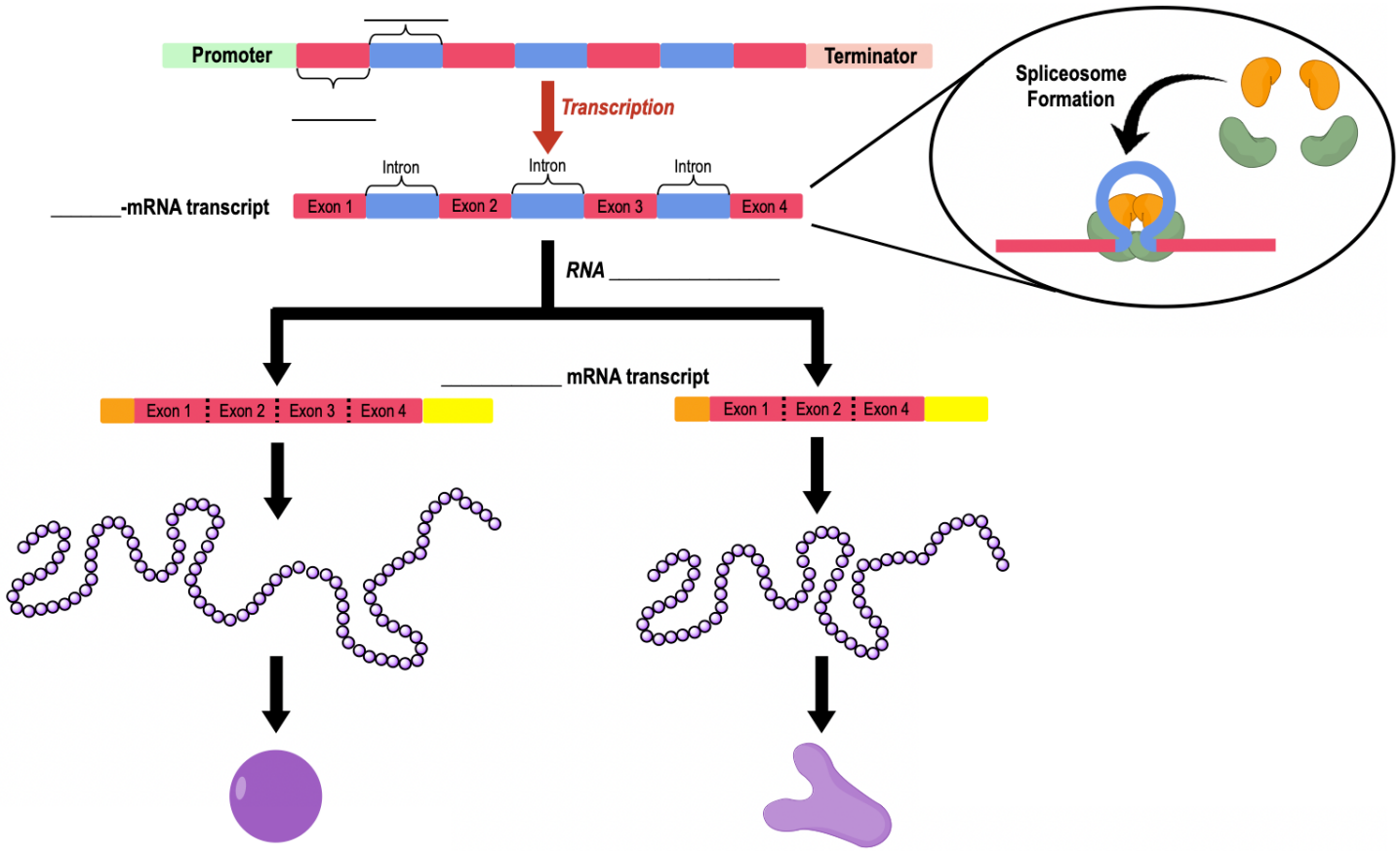
2) RNA Splicing Creates Mature mRNA

●Within eukaryotic genes are regions called _____ & _____ that are transcribed into pre-mRNA.

●**RNA Splicing:** process _____ some regions of pre-mRNA (*introns*) & *reconnecting* remaining regions (*exons*).

- □ _____**trons**: *non*coding regions of DNA/RNA that **in**tervene/**in**terrupt coding regions, but do NOT get translated.
- □ _____**ons**: *coding* regions of DNA/RNA that are **ex**pressed & do get _____.
- □ **Spliceosome**: large complex of RNA & protein responsible for removing introns.

EXAMPLE: The spliceosome removes introns from the pre-mRNA transcript after transcription.



●**Alternative RNA Splicing**: genes can be spliced in _____ ways to give _____ products.

PRACTICE: The regions in DNA & RNA that encode actual gene products are known as:

a) Terminators.
b) mRNA.
c) Exons.
d) tRNA.
e) Promoters.