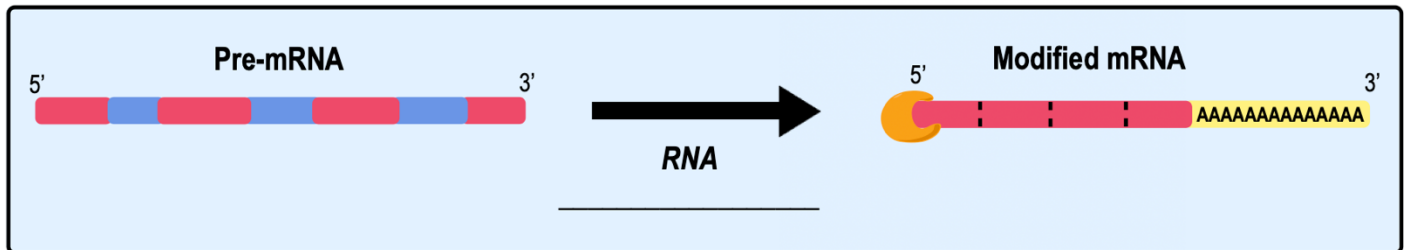


CONCEPT: EUKARYOTIC RNA PROCESSING & SPLICING

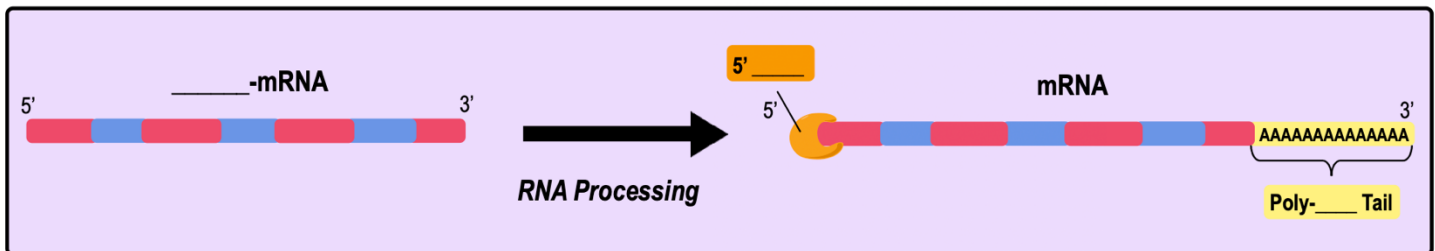
- *Recall:* unlike prokaryotic mRNA, _____ mRNA requires further *modification* upon transcription termination.
 - _____-mRNA: eukaryotic mRNA *before* modification via *RNA processing & splicing*.
 - **RNA Processing & Splicing:** eukaryotic processes converting pre-mRNA into mRNA that's ready for *translation*.



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. | c) Adenine nucleotides are added to the 5' end of the mRNA. |
| b) A cap is added to the 5' end of the mRNA. | d) RNA polymerase requires tRNA to elongate the molecule. |

PRACTICE: An mRNA poly-A tail:

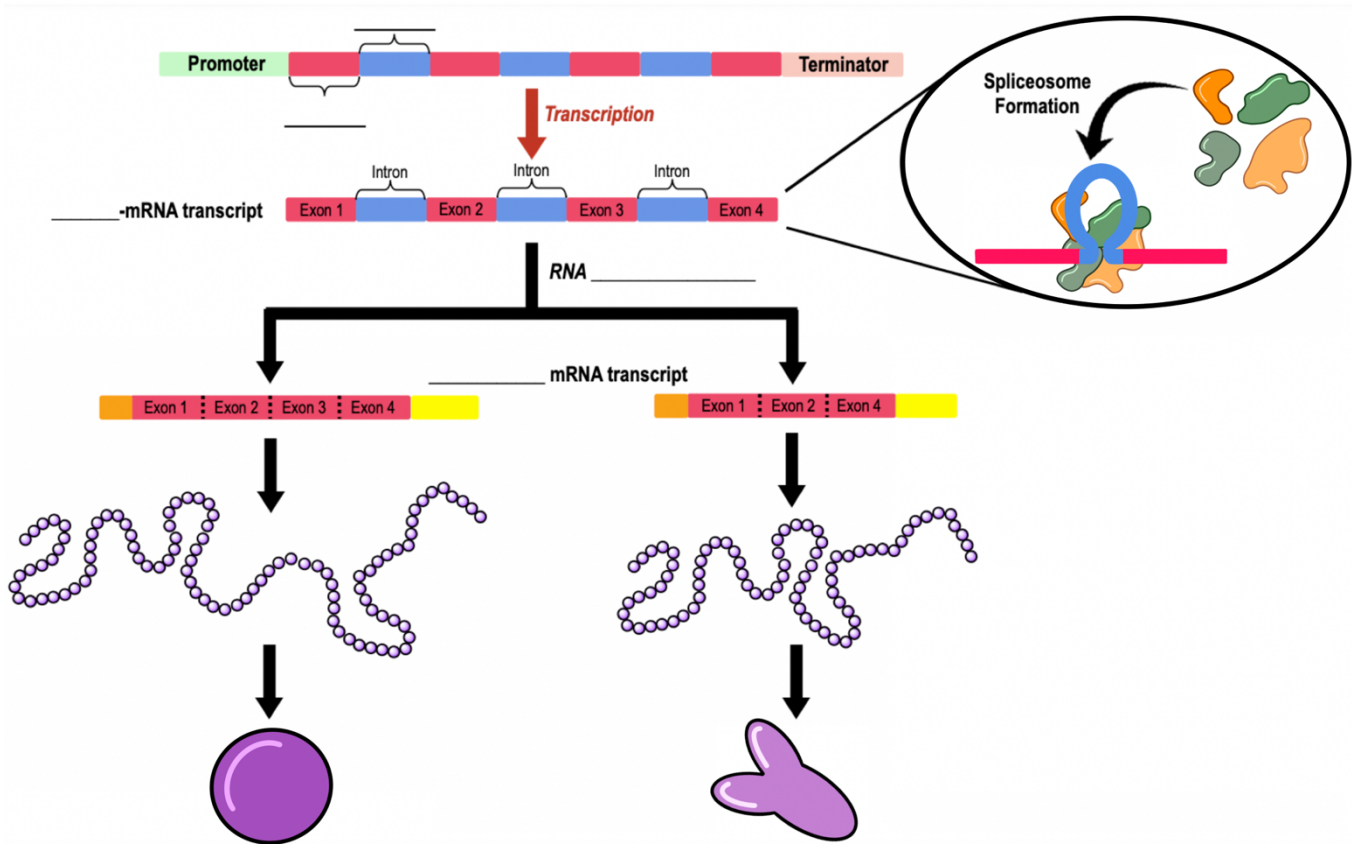
- | | |
|----------------------------|--|
| a) Prevents translation. | c) Marks the RNA for degradation. |
| b) Prevents transcription. | d) Protects the mRNA from degradation. |

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).
 - introns: *noncoding* regions of DNA/RNA that *intervene/interrupt* coding regions, but do NOT get translated.
 - exons: *coding* regions of DNA/RNA that are **expressed** & 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. | c) Exons. | e) Promoters. |
| b) mRNA. | d) tRNA. | |