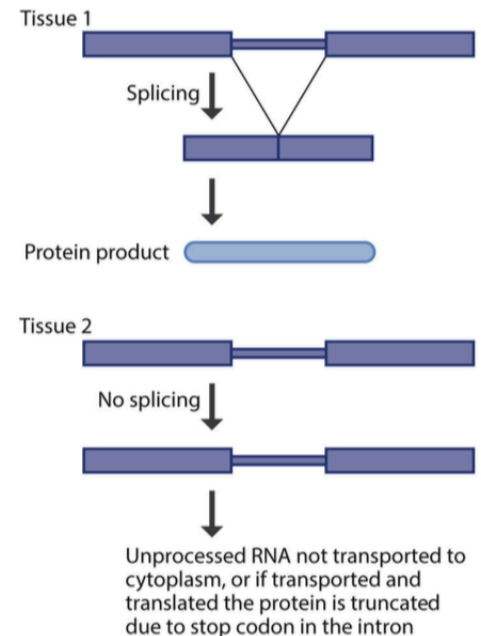


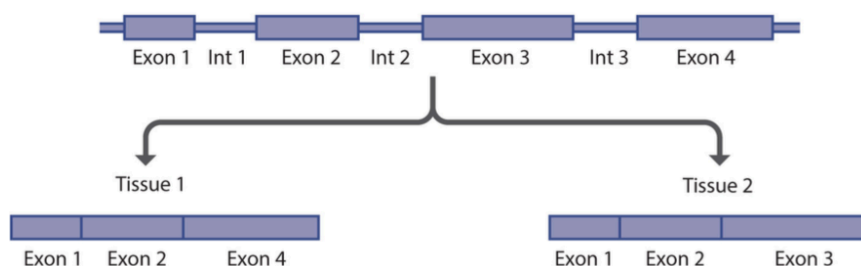
CHAPTER 7 : POST-TRANSCRIPTIONAL REGULATION

INTRODUCTION : REGULATION OF ALTERNATIVE SPLICING

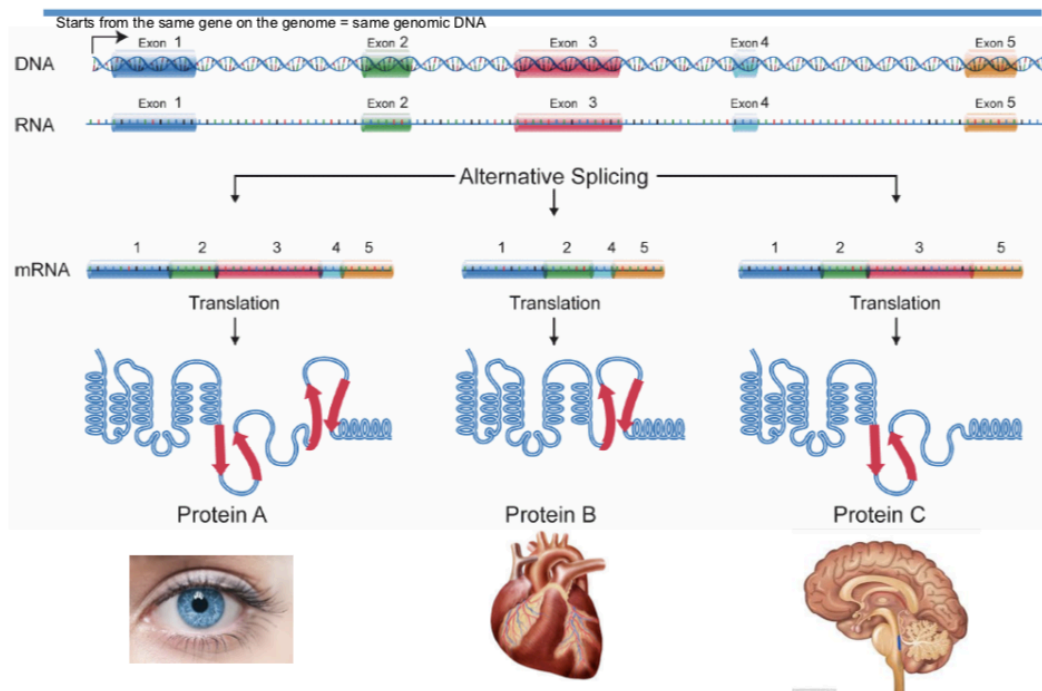
- Splicing is tissue specific
 - Different mRNAs will therefore encode for unique proteins
 - The absence of RNA splicing of a transcript in a particular tissue results in a lack of production of the corresponding protein.
 - Mediated by tissue specific splice factors (ISS , ISE , ESS and ESE)
- Processing vs discard decisions are also made
 - Unspliced RNA would be degraded within the nucleus OR
 - Transported to cytoplasm where it is unable to make a functional protein due to the interruption of the protein-coding regions = degraded via nonsense mediated degradation pathway



- Alternative splicing represents a major regulatory process which supplements transcriptional control
- Single gene is transcribed in different tissues , each processed differently to yield different functional mRNAs
- In most cases, these RNAs are processed alternatively to yield different products
 - Frequent process in embryonic development , sex determination , muscular contractions , neuronal functioning . In Humans , 90% of genes undergo alternative splicing
- The regulation of splicing is linked to regulation of transcription
- Alternatively spliced gene is only transcribed in certain cell types
- Alternative splicing of the same primary transcript in two different ways results in two different mRNA molecules.

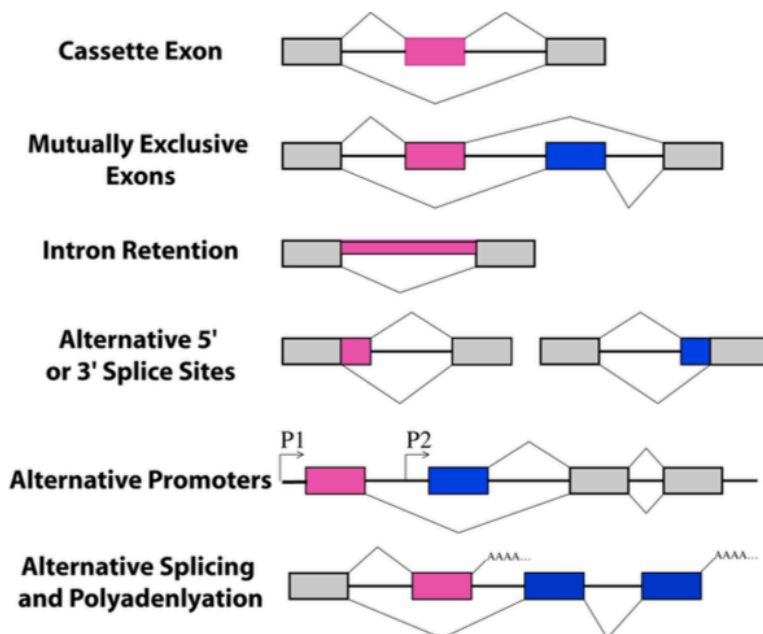


INTRODUCTION: REGULATION OF RNA SPLICING



HOW CAN ALTERNATIVE SPLICING BE MEDIATED

- Numerous models are known for how alternative splicing is regulated in a cell



5 MODELS:

1. Differential use of promoters
2. Folding of the transcript
3. Trans-acting proteins that bind to cis-acting sites
4. Rate of transcription elongation