

Protein Synthesis

Three step process of transcription, splicing and translation.

Transcription

- Takes place in the **Nucleus** of cells
- Its **purpose** is to make a **pre-mRNA copy** of a DNA template strand
- The **enzymes involved** are **DNA helicase and RNA polymerase**

Method:

1. **DNA helicase separates the DNA** strands by **breaking hydrogen bonds**
2. **RNA polymerase** binds to the template strand at the **start of the gene**
3. **Free RNA nucleotides** bind with the bases on the template strand via **complimentary base pairing**. The RNA polymerase moves along the strand and joins the RNA nucleotides together **via phosphodiester bonds** to form a pre-mRNA molecule
4. When the RNA polymerase reaches a **stop triplet** it detaches and the pre-mRNA production is complete

Splicing

- Takes place in the **Nucleus**
- Its **purpose** is to **remove introns** (part of DNA sequence that do NOT code for amino acids) and **join the exons** (parts of DNA sequence that DO code for amino acids) together
- Enzymes are involved

Splicing is where **pre-mRNA is converted into mRNA** by the removal of introns in the nucleus of a cell. Splicing involves enzymes and only occurs **in eukaryotes**

Translation

- Takes place in the **Cytoplasm**
- Its **purpose** is to join **amino acids together via peptide bonds** requiring enzymes and **ATP in a condensation reaction**

Method:

- 1- A **ribosome** attaches to the mRNA at the **start codon**