

- Which protein is manufactured depends upon the provided instructions by the DNA
- Process:
 1. DNA provides the **instructions** in the form of a long sequence of bases
 2. Pre-mRNA is produced using part of the DNA as a template- **TRANSCRIPTION**
 - prokaryotes , transcription results directly in the production of mRNA from DNA
 - eukaryotes...
 3. **Spliced** to form mRNA
 4. The production of polypeptides from the sequence of codons carried by mRNA **TRANSLATION**

The process of Transcription:

1. An **enzyme** acts on a specific region of the DNA causing the two strands to **separate** & **expose** the nucleotide bases in that region
2. The nucleotide bases on the **template** strand **pair with complementary free nucleotides** in the nucleus.
RNA polymerase moves along the strand and joins the molecules together to form a pre mRNA molecule.
3. Eg: an exposed G base on the DNA binds to the C of a free nucleotide.
4. As the RNA polymerase adds the nucleotides one at a time to build a pre-mRNA strand, the **DNA strand rejoins** behind it.
5. When the RNA polymerase reaches a particular sequence of bases on the DNA that it recognises as a **'stop' triplet ends**, the production of pre-mRNA is complete.

Splicing of pre-mRNA to mRNA

- The DNA of a gene is made up of **exons** that code for proteins/DNA & **introns** that do not
- Introns would **prevent the synthesis of a polypeptide**
- The base sequences corresponding to the introns are **removed** and the functional exons are **joined together**
- The mRNA molecules leave via a **nuclear pore**
- **Attach to the ribosomes** for translation- it will determine the synthesis of a polypeptide

Polypeptide Synthesis-translation

How a polypeptide is made:

- 1) The **mRNA attaches** itself to a **ribosome** and **tRNA molecules** **carry amino acids** to the ribosome.
- 2) A tRNA molecule with an **anticodon complementary** to the **first codon** on the mRNA attaches itself to the mRNA by **specific base pairing**