Transcription and Translation

DNA - controls the processes of the cell by producing different types of proteins, e.g. enzymes, hormones.

Protein synthesis can be divided into two different processes, transcription and translation. Transcription takes place inside the nucleus and translation takes place outside the nucleus.

The sections of DNA that code for particular proteins are known as genes. Genes have specific types of nitrogenous bases arranged in groups of three (triplet code).

In transcription, each strand of the DNA copied into mRNA.

DNA and RNA have the same number of carbon but differ by a single oxygen atom (Deoxyribose nucleic acid). IN RNA there is adenine, uracil, guanine and cytosine. IN DNA there is adenine, thymine, guanine and cytosine. DNA is a double stranded molecule while RNA is a single stranded molecule.

Complementary base pairing is the process in which opposite nitrogenous bases are bonded together.

Transcription:

(1) DNA is unzipped by the enzyme RNA polymerase.

(2) Free nucleotides move into place along one of the two strands.

(3) The same enzyme, RNA polymerase, assembles the free nucleotides in the correct places using complementary base pairing.

(4) The size of the single strand of mRNA is much smaller than the DNA because transcription copies only one gene into mRNA.

(5) The RNA separates from the DNA, and DNA double helix is zipped up again by RNA polymerase.

Translation:

(1) Due to complementary base pairing, the sequence of bases along the mRNA molecule corresponds to the sequence of the original DNA molecule. Each sequence of three bases, called a triplet, corresponds to a specific amino acid, so the order of these triplets determines how amino acids will be assembled into polypeptide chains in the cytoplasm.