

Protein Synthesis

Protein Synthesis consists of two parts, transcription and translation. Transcription is the process of making mRNA, the “recipe” for the protein, by copying the DNA. Translation is the process of taking the mRNA and reading it to synthesize proteins.

Transcription:

In the nuclear matrix a strand of DNA is read by RNA polymerase, an enzyme, and looks for the promoter, a sequence that says start here. Once the promoter has found it, the DNA is unwound and the hydrogen bonds in between the nitrogenous bases are broken until the termination signal is reached. Free floating DNA nucleotides then hydrogen bond to their corresponding nitrogenous base (A – U, C – G, T – A). The RNA polymerase then bonds the phosphate of one nucleotide to the ribose of the next. Once the termination signal is reached, the mRNA brakes off. Transcription is complete.

Translation:

The mRNA travels to find the SRS (Small Ribosomal Subunit) and the SRS reads the mRNA. Once the start codon (AUG) is read, the SRS calls out for AUG’s tRNA containing its anticodon and amino acid. If the codon is read incorrectly then the SRS rejects it. If it is correct it calls for the LRS (Large Ribosomal Subunit). The SRS then reads the next codon and calls for its tRNA. It is checked and the LRS bonds the amino acid of the tRNAs together. The previous tRNA then leaves and finds another one of its corresponding amino acids. This process ends when the SRS reads the stop codon.

A codon is a set of three nitrogenous bases that code for a specific amino acid.

An anticodon is the complementary base sequence to the codon.

mRNA – messenger RNA

tRNA – transfer RNA