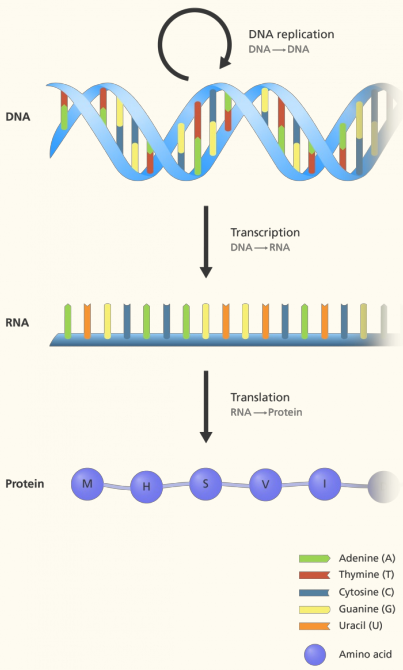
Definition

The Central Dogma of Molecular Biology describes the flow of genetic information in living organisms. It outlines the processes of DNA replication, transcription, and translation, which collectively govern the synthesis of proteins.

Central Dogma



Processes

a. DNA Replication	DNA replication is the process by which a double-stranded DNA molecule is copied to produce two identical DNA molecules. It occurs in the nucleus during the S phase of the cell cycle.
b. Transcription	Transcription is the process of synthesizing an RNA molecule using a DNA template. It takes place in the nucleus and involves three main steps: initiation, elongation, and termination.
c. Translation	Translation is the process of protein synthesis, where the information stored in mRNA is converted into a specific sequence of amino acids. It occurs in the cytoplasm and involves ribosomes, tRNA molecules, and amino acids.

DNA to Protein

a. DNA is transcribed into mRNA in the nucleus.
b. mRNA is modified and transported out of the nucleus into the cytoplasm.
c. mRNA binds to a ribosome in the cytoplasm.
d. Ribosomes read the mRNA sequence and translate it into a specific sequence of amino acids.
e. tRNA molecules bring the corresponding amino acids to the ribosome.
f. Amino acids are joined together to form a polypeptide chain.
g. The polypeptide chain folds into a functional protein.

Key Molecules

DNA (Deoxyribonucleic Acid)	DNA is a double-stranded molecule that carries the genetic information of an organism. It consists of nucleotides, which contain a sugar (deoxyribose), a phosphate group, and one of four nitrogenous bases (adenine, thymine, cytosine, or guanine).
RNA (Ribonucleic Acid)	RNA is a single-stranded molecule involved in various cellular processes. There are different types of RNA, including messenger RNA (mRNA), transfer RNA (tRNA), and ribosomal RNA (rRNA).
mRNA (Messenger RNA)	mRNA carries the genetic information from DNA to the ribosomes during translation. It is synthesized during transcription and undergoes modifications before being transported out of the nucleus.
tRNA (Transfer RNA)	tRNA molecules are responsible for carrying specific amino acids to the ribosomes during translation. They have an anticodon that binds to the complementary codon on mRNA.
rRNA (Ribosomal RNA)	rRNA is a component of ribosomes, which are cellular structures where protein synthesis occurs. Ribosomes consist of rRNA and proteins.

Significance

The Central Dogma of Molecular Biology explains how genetic information is stored, replicated, and expressed in living organisms. It is crucial for understanding the fundamental processes of life and plays a central role in genetics, molecular biology, and biotechnology.

Remember that this cheat sheet provides a simplified overview of the Central Dogma. The actual processes are more complex and involve additional regulatory mechanisms and factors.

Get More Details

https://microbiologynote.com/central-dogma-definition-replication--transcription-translation/

By **Sourav Pan** (Sourav355)
cheatography.com/sourav355/
biologynotesonline.com/

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