**Purpose**

The **Central Dogma of Biology** describes how Genetic Information is inherited to the next generations of cells and how it is manipulated and decoded for polypeptide synthesis.

The purpose of the **Central Dogma script** is emulating the Central Dogma of Biology procedures, aiding ***secondary education biology students*** in understanding and applying their concepts. For example, one of the primary objectives is to help students acquire how to read the **Genetic Code Table**. It will also assist ***biology teachers*** in writing their own practical exercises. These procedures are:

1. **Replication**
2. **Transcription**
3. **Translation**

**1. Replication**

Replication creates the complementary and antiparallel DNA strand of the coding DNA strand, following **Chargaff's rule**. Its purpose is to create two copies of a DNA molecule, that they will be inherited by the daughter cells of a parent cell.

**DNA strands** are composed of subunits that are called **deoxyribonucleotides**. Deoxyribonucleotides are linked together by **phosphodiester bonds**, forming a long strand. **DNA polymerase** is the enzyme responsible for synthesizing the **daughter** DNA strands. It achieves this by pairing deoxyribonucleotides with the complementary deoxyribonucleotides of the **parent** (old) strand in an antiparallel orientation.

Each deoxyribonucleotide can have one of the following nitrogenous bases:

| **Table 1A: DNA Nitrogenous bases** |
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|  | **Name** | **Category** |
| --- | --- | --- |
| 1. | Adenine (A) | Purine |
| 2. | Thymine (T) | Pyrimidine |
| 3. | Guanine (G) | Purine |
| 4. | Cytosine (C) | Pyrimidine |

According to Chargaff's rule a Purine can pair only with a Pyrimidine. Specifically:

1. A pairs with T via 2 Hydrogen bonds.
2. G pairs with C via 3 Hydrogen bonds.

The formation of **double stranded DNA** occurs, when two DNA strands pair. Pairing prerequisites for the pairing strands are that they consist of nucleotides whose nitrogenous bases sequences are **complementary**, and their orientations are **antiparallel**.

**Example 1**

For the input DNA starnd sequence:

5' ATGGAGCTCTAA 3'

The complementary and antiparallel DNA strand sequence, after replication, will be:

3' TACCTCGAGATT 5'

Finally, the double-stranded DNA will be:

5' ATGGAGCTCTAA 3'
3' TACCTCGAGATT 5'