**THE CENTRAL DOGMA OF BIOLOGY**

 **Purpose**

The Central Dogma of Biology helps you understand how our body's information (like instructions) is passed on to new cells and how it's used to build proteins. It's like a set of rules that explains how our body works.

For students in secondary school, this project is made to make learning biology easier. One big goal is to help you learn how to read the Genetic Code Table, which is like a secret code our body uses.

There are three main parts: making copies of information (Replication), turning information into a usable form (Transcription), and building proteins (Translation).

1. **Replication**

When two DNA strands come together to form a double-stranded structure, it's like they're holding hands. For this handholding to happen, the tiny building blocks in each strand need to match up, like puzzle pieces fitting together. It's important that these building blocks are like puzzle pairs, and the two strands run in opposite directions. This way, they make a stable structure, just like when you link your hands with a friend, and everything fits perfectly.

1. **Transcription**

Transcription is like making a special messenger note, called mRNA, from a DNA instruction book. The mRNA has the same sequence of building blocks as one side of the DNA, and it's made of slightly different building blocks called ribonucleotides.

Imagine the DNA is a library, and the mRNA is like a note taken out of that library when needed. The note (mRNA) carries the information the cell currently requires. It's cool because cells can create or get rid of these notes based on what the environment or signals tell them.

One important thing is that in mRNA, instead of using the letter "T" like in DNA, they use "U." So, it's like having a special code in the note that helps the cell know what to do. The DNA, on the other hand, is like the safe library that always keeps all the important information throughout the cell's life.

Think of RNA polymerase as a builder that creates a special message (mRNA) by connecting building blocks (ribonucleotides) to a DNA strand. They stick together like puzzle pieces.

Following the rules:

A (Adenine) connects with U (Uracil) using 2 bonds.

A (Adenine) connects with T (Thymine) using 2 bonds.

G (Guanine) connects with C (Cytosine) using 3 bonds.

It's like using a special glue to match the right pieces. So, the builder puts together a perfect message that matches the DNA strand, ensuring everything fits perfectly.

1. **Translation**

Translation is like building important workers in the cell called proteins. These workers, called proteins, are made up of chains called polypeptides. This process connects building blocks called amino acids to make these chains, using information stored in DNA.

Imagine the information in DNA is like a recipe book. When the cell needs to make a protein, it reads a specific recipe from the DNA. The workers in the cell, called ribosomes, follow the recipe step by step. They read groups of three instructions at a time, called codons, and use another set of helpers, called tRNA, to bring in the right building blocks, amino acids.

The first step in the recipe, AUG, often signals the start, like saying, "Let's begin here." The last step is one of three codes, UGA, UAA, or UAG, saying, "This is the end." The recipe's length must be a multiple of three, and the starting and ending instructions define how the workers read it.

If the DNA recipe follows the rules (starts with ATG and ends with a stop code), it gets translated into a protein using a special code. For example, if the recipe is AUGGAGCUCUAA, the protein made would be like a string of beads: Met-Glu-Leu.

This is how cells use the information in DNA to make the workers (proteins) they need to do their jobs.