Central Dogma of Molecular Biology

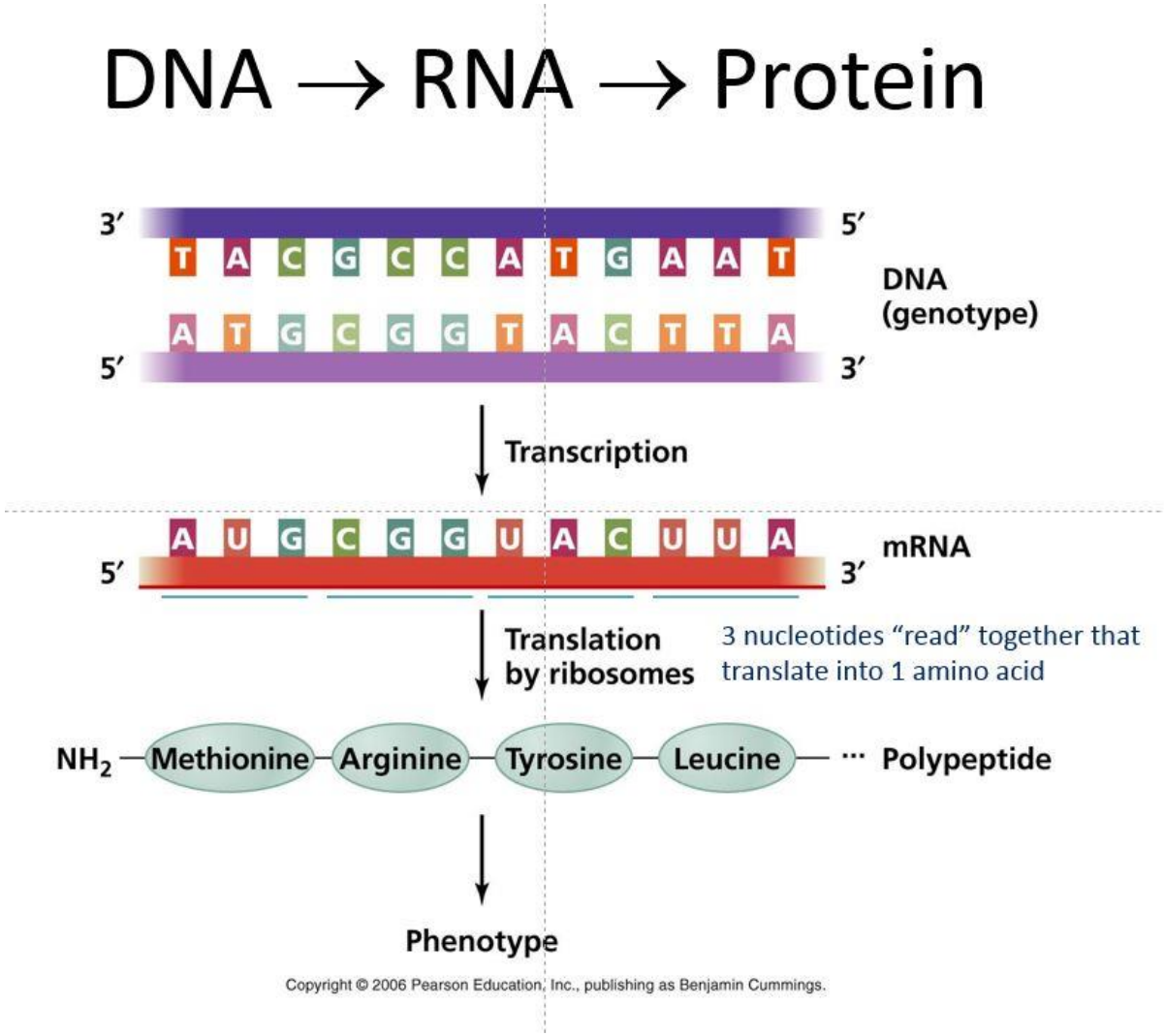
Welcome to the Molecular World of Biology! If you've ever wondered how living things work on the tiniest level, you're in for a treat.

Think of your body as a big instruction manual, and DNA is like the master copy of that manual. It's made up of tiny building blocks called nucleotides, and each nucleotide is like a letter in a super special alphabet.

Now, the Central Dogma is like the rulebook that tells us how the information in DNA gets used to make all the stuff your body needs, like proteins. Proteins are like the workers in a factory, doing all sorts of important jobs to keep you healthy and growing.

Here's how it works: first, DNA gets copied into a molecule called RNA. This process is called transcription, and it's like making a photocopy of a page in the instruction manual. Then, the RNA goes to a special place in the cell called the ribosome, where it's used as a template to build proteins. This step is called translation, and it's like using the photocopy to make something new.

So, in simple terms, the Central Dogma is all about how the instructions in DNA are read and used to make proteins, which are essential for everything your body does. Pretty cool, right? It's like a super important recipe for life!



Protein Building Blocks

The building blocks of proteins are molecules called amino acids. Imagine amino acids as individual Lego blocks, and proteins as complex structures built by connecting these blocks together.

There are 20 different types of amino acids commonly found in proteins. Each amino acid has a unique structure consisting of a central carbon atom bonded to four different chemical groups: 1. Amino group, 2. Carboxyl group, 3. Variable group (side chains), 4. Hydrogen atoms.

As you read through the following information, think of yourself as a Ribosome, performing the "**Translation**" process to build a protein.

Here's how it works:

Codon Party: The instructions in the mRNA are written in a special code made up of three-letter words called codons. Each codon tells the ribosome which specific amino acid to grab next.

Amino Acid Assembly Line: Now, here comes the really cool part! Special molecules called transfer RNA (tRNA) bring the amino acids to the ribosome. Each tRNA carries one specific amino acid and has a special code (called an anticodon) that matches up with the codon on the mRNA.

Building the Protein: As the ribosome reads the mRNA and matches up the codons with the correct amino acids brought by the tRNA, it starts linking the amino acids together in a chain. It's like putting together a giant Lego model, one block at a time, following the instructions step by step.

Finishing Touches: Once the ribosome reaches a special "stop" codon on the mRNA, it knows the protein is complete. The chain of amino acids is released from the ribosome and can go on to fold into its final shape, ready to do its job in the cell.

So, in a nutshell, translation is the process by which the genetic instructions carried by RNA are used to build proteins, allowing the cell to carry out its many functions and activities. It's like the ribosome is the chef, following the recipe encoded in RNA to create the proteins that keep the cell running smoothly!

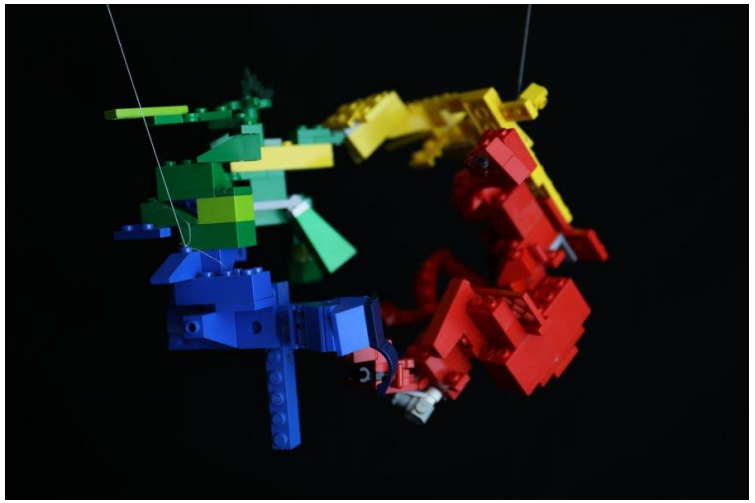


Image shows hemoglobin created from Lego bricks, by Davit Rickards from tgschool

Image from: twitter.com/PDBeurope