DNA tells cells which proteins to make

KS4 BIOLOGY Ages 11-15 ⏰ 3 min read

Your Body's Instruction Manual

Inside every cell in your body, there's a special molecule called **DNA**. Think of DNA as an enormous instruction manual that tells your cells exactly what to do. One of the most important jobs DNA has is telling cells which **proteins** to make. Proteins are like the workers in your body — they do almost everything: they help you move, fight germs, digest food, and grow.

How the Instructions Travel

Your DNA lives safely in the **nucleus**, which is like a protected vault in the middle of each cell. But the cell can't manufacture proteins right in the nucleus — it needs to send the instructions somewhere else. So the cell makes a temporary copy of the instruction for just one protein. This copy is called **messenger RNA**, or **mRNA** for short.

Think of it like photocopying a recipe from a cookbook. You don't want to take your precious original cookbook to the kitchen where it might get messy, so you make a copy to use while you cook.

Reading the Code

The mRNA leaves the nucleus and travels to a tiny structure called a **ribosome**. The ribosome reads the mRNA message, three letters at a time. Each group of three letters is called a **codon**, and each codon is an instruction for adding one building block to the protein. These building blocks are called **amino acids**.

Imagine a ribosome as a LEGO builder following an instruction sheet. The mRNA is the sheet, codons are the steps, and amino acids are the LEGO blocks being snapped together one by one.

Building the Protein

As the ribosome reads down the mRNA, it collects the correct amino acids from around the cell and links them together in the exact order the DNA specified. When

the ribosome reaches the end of the instructions, the new protein is complete. This protein can now do its job — whether that's carrying oxygen, fighting infection, or building muscle.

Why This Matters

This process happens millions of times in your body every single day. If the DNA instructions are wrong, the wrong protein gets made, which can cause disease. Understanding this process has helped scientists develop **vaccines**, create treatments for genetic diseases, and even design new medicines. It's one of the most important discoveries in biology!