



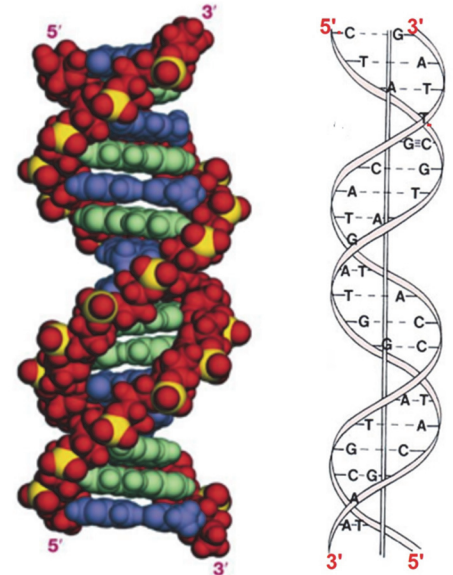
DNA... What is it and why is it so important?!

We are all made of trillions of cells. Each cell has its own job. Some cells help us detect light and see, other cells help us touch, some cells help us hear, other cells carry oxygen around, other cells help us digest food by secreting enzymes. There are over 200 cell types in the body - that is 200 different jobs!

But *how does each cell know what job to do?* Our cells are told what to do, but not by a person or a computer! Our cells are told what to do by a very special molecule called DNA.

DNA is a record of instructions telling the cell what its job is going to be. A good analogy for DNA as a whole is a computer code telling a PC what to do. It is written in a special alphabet that is only four letters long! DNA has a beautifully curved ladder- like shape called a **double helix**.

DNA Structure



The DNA Alphabet

The letters of the DNA alphabet (called bases) make up the rungs, special sugars and other atoms make up the handrail. The rungs are very special. Each one has a name, but they prefer to be called by their initials: A, T, C and G. They don't like to be by themselves so they always pair up with a friend. But they are very choosy about their friends:

A and T are best friends and always hang out together
G and C are best friends and always hang out together

Another way of looking at it is that A, T, G and C are like jigsaw pieces. A and T fit together, C and G fit together. You cannot force a puzzle piece into the wrong place!

Just like we use letters to make words and sentences, similarly the code in DNA is used to give the cell instructions. If you unwind the DNA and look at a length of DNA, you can read out the letters all in a row:

ATGCGTGGTCAGTCGATATATGGCCCC

These letters make up words that are *always* three letters long. These are called **codons**.

ATG CGT GGT CAG TCG ATA TAT GGC CCC

These words make up sentences that the cell understands. These sentences are called **genes**.

[ATG CGT GGT CAG] [TCG ATA TAT GGC CCC]

Gene 1

Gene 2

Each sentence tells a cell to make a special molecule called a **protein**. These proteins control everything in a cell and help each cell do its job. Each gene makes one protein, and only one protein.

Each cell therefore uses the DNA in its nucleus to make millions of proteins which allow it to function. All living organisms including bacteria, fungi, plants and animals use the same DNA code for making proteins. This code is therefore termed a **universal code**.