

Franklin's discovery revolutionised how we see DNA today.

NATIONAL DNA DAY

25 April is National DNA Day. It marks the discovery of DNA's double helix in 1953.

Rosalind Franklin

Most of the crucial clues to the structure of DNA were found by this unsung hero.

The discovery of the structure of deoxyribonucleic acid (DNA) was one of the major scientific advances of the last century. DNA is a chemical that is in every cell of your body and carries all the information about it. DNA tells your cells how to function. It governs how your body grows and develops, and is responsible for characteristics such as the colour of your eyes and hair, and how your internal organs work. In the years after the Second World War, many scientists were racing to be the first to discover how this chemical was arranged. Rosalind Franklin was at the forefront of the research into DNA, yet at the time her groundbreaking work went mostly unrecognised.

A life in science

Franklin was born in London on 25 July 1920. She went to St Paul's Girls' School in London, which at the time was one of the few girls' schools to teach physics and chemistry. By the age of 15, she had decided to become a scientist, and aged 18 she went to Cambridge University, where she studied physical chemistry. Franklin went on to become an expert in X-ray crystallography – a technique that uses the way X-rays pass through crystals to work out how atoms are arranged in crystal shapes. In 1951, she became a research fellow at King's College, London where she applied her expertise to the study of DNA.

Discovering the double helix

Unfortunately, Franklin and the scientist she was supposed to work alongside at King's College, Maurice Wilkins, didn't get on. They mostly worked separately. However, Franklin's and Wilkins's X-ray photos were the clearest ever images of what DNA looked like. A photograph taken in 1952 by Raymond Gosling – a student

working under Franklin – confirmed that DNA looks a bit like a ladder that has been twisted into a spiral. This structure is usually described as a double helix. The photo is known as Photo 51.

Crick and Watson win the race

At the same time another team – Francis Crick and James Watson, based at Cambridge University – were trying to build a model of the chemical structure of a DNA molecule. When Wilkins showed Photo 51 to Crick and Watson (without Franklin's permission), it was the key that unlocked the puzzle. This breakthrough helped Crick and Watson to finish their model in 1953, and meant that they won the race to be known for discovering how DNA is structured. The discovery of the double helix totally changed our understanding of the way in which human bodies work. It made clear how a simple chemical could hold so much information about a person. It also explained how cells copy their information when they divide and how DNA from two people combines to make a new person. This helped scientists to understand why most people look a bit like their parents, and how certain diseases are inherited (passed on down generations).

Big effects

For their discovery, Crick, Watson and Wilkins were awarded a Nobel Prize in 1962. Franklin's contribution was not credited because Nobel Prizes can only be awarded to living people and Franklin died of cancer in 1958 aged just 37. However, the part Franklin played is at last being recognised. In 2020, the European Space Agency (ESA) will send a new rover bearing her name to Mars, where it will search for signs of life. "This name reminds us that it is in the human genes to explore. Science is in our DNA," said the ESA's director general.

A FAMOUS PHOTO

Photo 51 is so named because it was the 51st image taken by Franklin and Wilkins.

What is DNA?

- Deoxyribonucleic acid (DNA) is an information-storing chemical that is vital to all living organisms.
- DNA is inside the nucleus (centre) of each cell in your body and there's a lot of it – about six metres per cell. If you stretched out all the DNA in your body, it would reach across the entire solar system and back again.
- Genome is the word used to describe the complete set of DNA contained in a living thing. The human genome is split across 23 pairs of tiny thread-like structures called chromosomes.
- The spirals of DNA contained on each chromosome are split into small sequences called genes. These act as instructions, telling the cell how to grow and how to develop.
- Information is stored in DNA as a code "written" in four different base pairs that form the parts of DNA's double spiral that look like the rungs of a ladder. There are around three billion of these base pairs in any cell.

To find out more about DNA go to yourgenome.org

Franklin's photo 51, which was used to prove DNA's double helix structure.

