

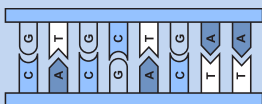
A deep dive into the history of discovery of the double helix.

The double helical structure of a DNA molecule is one of the indisputable facts which academics in the fields of Biology and Chemistry regard as a dogma. The shape of the molecule complements its function: it provides the genetic material with a stable structure, allowing it to easily and reliably replicate, and making the process of intracellular protein synthesis smoother.

The structure of a DNA molecule was not always as clear as it is to us today. It was only after experimentation (such as that conducted by Hershey and Chase in 1952), that DNA was even confirmed to be the genetic molecule responsible for the coding of proteins, and hence the traits expressed by an organism. Scientific breakthroughs such as those made by Chargaff also contributed to our knowledge of the structure of the molecule. Even so, the structure of DNA had only been hypothesised up until 1953, with no proper evidence to support any of the claims made.

With the help of a technique known as X-ray diffraction, a group of scientists were able to finally ascertain the shape of a DNA molecule, providing some evidence to support the claim for its double helical structure in the ongoing discussion. Credit for this discovery was given to James Watson and Francis Crick in the form of a Nobel Peace prize. This discovery was groundbreaking for scientists worldwide, as it aided us to better understand the functions of many important biological and chemical processes (and even phenomena). The work of these scientists majorly contributed to our knowledge and progress in many modern fields of science.

What many people do not know is that the discovery of the double helical shape could not be entirely attributed to the work of Watson and Crick. Much of their discovery was actually only possible due to the work of Rosalind Franklin, who was the scientist responsible for originally utilising X-ray diffraction to observe the structure of a DNA molecule. It was her photograph - “photograph 51” as it was termed by Franklin, which Watson and Crick interpreted to infer the real structure of a DNA molecule, subsequently correcting their initial “triple helix” model, and then publicising their findings.



Amongst those who know about this chain of events, many incorrectly believe Franklin to be someone who was unable to interpret her own data. As Franklin passed away at the age of 37 to cancer (in 1958), this narrative is partially due to Watson's own retelling of events. However, in reality, many of Franklin's notes demonstrate that she did in fact consider the possibility of a double helical structure of the DNA molecule. However, due to the restrictions in terms of resolution of the image studied by her, as well as confusion between the "A" and "B" forms of DNA, Franklin eventually used her expertise as a chemist to reject the idea that the molecule was actually double helical in shape - a mistake even Crick admitted he would have made if he studied the "A" form of DNA himself.

CITATIONS

Cobb, Matthew, and Nathaniel Comfort. “What Rosalind Franklin Truly Contributed to the Discovery of DNA’s Structure.” *Nature*, vol. 616, no. 7958, 1 Apr. 2023, pp. 657–660, www.nature.com/articles/d41586-023-01313-5, <https://doi.org/10.1038/d41586-023-01313-5>.

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