The discovery of the structure of **DNA** was one of the most important scientific achievements in human history. We all know that the **double helix** was discovered by **Watson and Crick**, two of the scientists who won the **Nobel Prize**. But there's another name you may not know:

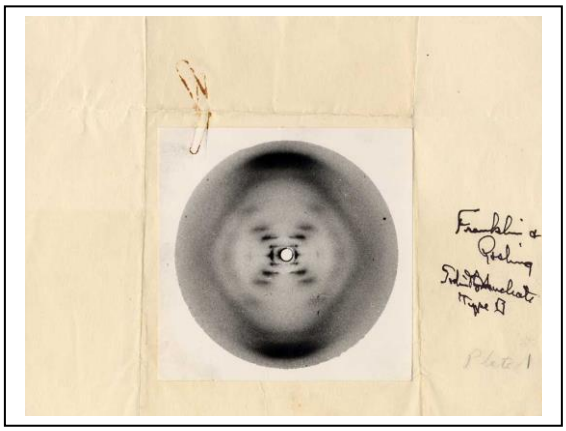
ROSALIND FRANKLIN

Let's watch the video

https://ed.ted.com/lessons/rosalind-franklin-dna-s-unsung-hero-claudio-l-guerra#watch

1. When was she born?
2. What did she want to be when she was a teenager?
3. Where did she study?
4. Where did she get her PHd?
5. What did she study in the laboratory?
6. Was she accepted by her colleagues?
7. What is PHOTO 51?
8. How long did it take her to study

   the structure of DNA?
9. Who were Watson and Crick?
10. What were they doing meanwhile?
11. What did Wilkins do?
12. What happened in 1953?
13. Did the journal publish the two manuscripts?



1958: Franklin died at the age of 37

1962: Wilkins Watson and Crick won the Nobel Prize for their work on DNA.

Her life was full of challenges, scientifically and socially.

She had to fight **prejudice** working in

- **a field dominated by men**
- **a time of sexism**,
  when women were presumed to be housewives and nothing more.

Her contribution to the discovery of the double helix structure of DNA was crucial, but she was in the shadows of science history. Wilkins and Franklin were supposed to work together but their personalities often clashed so they worked in isolation. Wilkins found two lab mates: Watson and Crick, while Franklin went on working on her own. Wilkins showed the new colleagues her beautiful PHOTO 51 without telling her.

EXTENSION:

Rosalind Franklin is an example of how hard it is for women to be accepted in the scientific community. Can you name other women who made relevant discoveries in science or gave important contributions in other fields? Was it difficult for them too?

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If you were Wilkins what would you have done when you got your hands on PHOTO 51?

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Why is it important that we know the structure of DNA?

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Her education. Franklin was born on July 25, 1920, in London, to a wealthy Jewish family who valued education and public service. At age 18, she enrolled in Newnham Women's College at Cambridge University, where she studied physics and chemistry. After Cambridge she went to work for the British Coal Utilization Research Association where her work on the porosity of coal became her Ph.D. thesis, and later it would allow her to travel the world as an guest speaker.

In 1946, Franklin moved to Paris where she perfected her skills in X-ray crystallography, which would become her life's work. Although she loved the freedom and lifestyle of Paris, she returned after four years to London to accept a job at King's College.

A passionate woman. Franklin worked hard and played hard. She was an intrepid traveller and avid hiker with a great love of the outdoors who enjoyed spirited discussions of science and politics. Friends and close colleagues considered Franklin a brilliant scientist and a kind-hearted woman. However, she could also be short-tempered and stubborn, and some fellow scientists found working with her to be a challenge. Among them was Maurice Wilkins, the man she was to work with at King's College.

An unhappy time. A misunderstanding resulted in immediate friction between Wilkins and Franklin, and their clashing personalities served to deepen the divide. The two were to work together on finding the structure of DNA, but their conflicts led to them working in relative isolation. While this suited Franklin, Wilkins went looking for company at "the Cavendish" laboratory in Cambridge where his friend Francis Crick was working with James Watson on building a model of the DNA molecule.

Unknown to Franklin, Watson and Crick saw some of her unpublished data, including the beautiful "photo 51," shown to Watson by Wilkins. This X-ray diffraction picture of a DNA molecule was Watson's inspiration (the pattern was clearly a helix). Using Franklin's photograph and their own data, Watson and Crick created their famous DNA model. Franklin's contribution was not acknowledged, but after her death Crick said that her contribution had been critical.

On to better things. Franklin moved to Birkbeck College where, ironically, she began working on the structure of the tobacco mosaic virus, building on research that Watson had done before his work on DNA. During the next few years she did some of the best and most important work of her life, and she travelled the world talking about coal and virus structure. However, just as her career was peaking, it was cut tragically short when she died of ovarian cancer at age 37.