

# Rosalind Franklin

*Rosalind Franklin was a physical chemist whose data helped solve the structure of DNA. She is also known for her research on coal and carbon during World War II and for her celebrated work on viruses.*

## A child who liked reasons and facts



Rosalind Elsie Franklin was born in London, England on July 25, 1920. She came from an educated and socially conscious Jewish family. Her father was a banker and her mother actively volunteered in the community.

As a child, Franklin didn't enjoy playing pretend games. Instead, she liked reasons and facts. Franklin attended St. Paul's Girls' School in London—one of the few girls' schools that taught physics and chemistry. By age 15, Franklin knew she wanted to be a scientist. However, her father didn't support higher education for woman and wanted Franklin to become a social worker. Franklin's mother and aunt convinced her father to pay for college.

## Wartime research

In 1941, Franklin graduated from Newnham College, Cambridge. World War II was underway when Franklin began working for the British Coal Utilization Research Association in 1942. Through air raids, Franklin courageously bicycled each day to her job. She studied the physical structure of coal and carbon to find a more efficient way for England to use these resources. At the young age of 26, Franklin published five papers on the subject. In 1945, she earned a doctorate in physical chemistry from Cambridge University.

From 1947 to 1950, Franklin joined the Laboratoire Central des Services Chimiques de l'Etat in Paris. There, she mastered a special x-ray technique called x-ray crystallography.

## X-ray crystallography and DNA

Franklin returned to England in 1951 to work as an x-ray crystallography expert at King's College in the University of London. Franklin was assigned to study the structure of DNA. She was under the impression that only she would be performing this research.

However, Franklin soon discovered that another scientist, Maurice Wilkins, was also assigned to the

project. Unfortunately, Franklin and Wilkins had difficulty getting along.

To make matters worse, female scientists at King's college were treated differently than the men. They were not allowed to eat lunch with the men in the common room and were not invited to join in afterwork discussions.

## Photo 51 and the DNA puzzle

Because of the strained relationship between Franklin and Wilkins, Franklin conducted her research alone. Franklin was growing very close to solving the DNA structure. She suspected that DNA had a helical shape, but wanted more evidence to support her theory. Wilkins was growing impatient with Franklin.

James Watson and Francis Crick were two other scientists from the Cavendish Laboratory of Cambridge who were also searching for the structure of DNA. Without Franklin's permission, Wilkins showed Watson her DNA data. This included a stunning picture Franklin labeled "photograph 51" that showed DNA's double helix structure. This information helped Watson and Crick solve the DNA puzzle.

## Viruses and RNA

In 1953, Franklin left King's College and began her renowned work on viruses at Birkbeck College. Between 1953 and 1958, Franklin published 17 papers on the topic. Her research helped to establish the link between RNA and protein. Up until her death, Franklin also conducted research on the poliovirus.

## An untimely death

Rosalind Franklin died at the age of 37 on April 16, 1958, of ovarian cancer. Four years after her death, the Nobel Prize for medicine and physiology was awarded to Watson, Crick, and Wilkins. Despite providing key data about DNA's structure, Franklin did not share in the prize. The Nobel Prize can only be given to living recipients and shared among three winners. Many wonder if Franklin would have received the prize if she had been alive.

## Reading reflection

1. What career obstacles did Rosalind Franklin face as a female scientist?
2. Describe Franklin's research during World War II that earned her a doctorate in physical chemistry.
3. How did Franklin contribute to solving the structure of DNA?
4. Why was Franklin not awarded a Nobel Prize, despite providing key data about DNA's structure?
5. What other important research did Franklin conduct during her final years before her death?
6. **Research:** Using the library or Internet, find out what contribution Franklin made to the 1958 World's Fair in Brussels.
7. **Research:** Using the library or Internet, find out which university recently changed its name in honor of Rosalind Franklin.