

Rosalind Franklin

Born: July 25, 1920, in Notting Hill, London, United Kingdom
Died April 16, 1958, Chelsea, London, United Kingdom



Credit: National Institute of Health

Overview:

Rosalind Franklin is one of the most notable scientists in history despite facing numerous challenges and setbacks during her lifetime. Being a female in the mid-1900's, she never received adequate recognition for her accomplishments while she was alive and in fact, the credit for one of the greatest discoveries of the 20th century went completely elsewhere. Franklin's tireless work would lead to the discovery of the helical shape of DNA and much of its structure. We will examine Franklin's early life, struggles, achievements, and controversy.

History of Her Life:

Rosalind Elsie Franklin was born on July 25, 1920, in London. Her parents were bankers with an Anglo-Jewish background. She was raised with her brothers, who were also interested in math and science however, Rosalind proved to be the most skillful of them all and even by age six was showing a tremendous aptitude for mathematics. Franklin's mother noted that Franklin always knew what she wanted to do from a young age. She attended Newnham College, one of Cambridge University's women's colleges, and majored in **physical chemistry**. She would go on to receive her Ph.D. at Cambridge University in 1945.



Newnham College
Credit: Orangecounty2008 at English Wikipedia

Reading Sample



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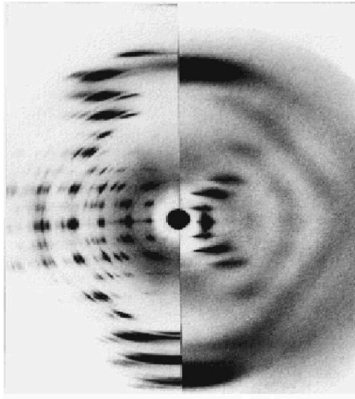


In keeping with her poor treatment at the hands of her male colleagues is the “discovery” of DNA by Watson and Crick to which they were awarded the Nobel Prize. Not everything is known but what is understood is that Watson and Crick were only able to make their discovery after using her work against her wishes. Franklin was never acknowledged or given credit for her work that led to one of the most important and groundbreaking discoveries the field of biology has ever seen.

Franklin died of ovarian cancer in 1958. Many suspect the cancer was caused by her exposure to X-ray radiation during her study on DNA.

What She Accomplished

At King's College, Franklin worked with a graduate student to study the structure of **DNA**. During this time she took some astonishingly clear x-ray diffraction photos of the molecule and discovered an "A" side (**dry side**) and a "B" side (**wet side**). She found that the "B" side was likely helix shaped. She originally thought that the "A" side was not helix shaped, but later realized that it was. She also found that phosphates were on the **outside** of the ribose chain (a **sugar molecule** found in the DNA double helix) instead of on the inside as many others had proposed.



A-DNA B-DNA

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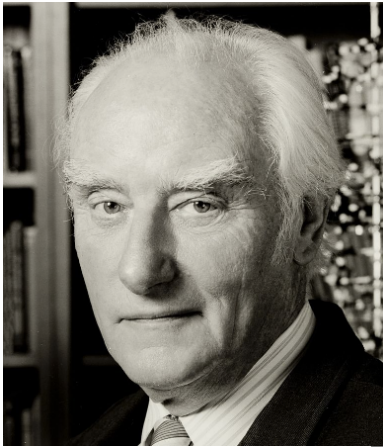
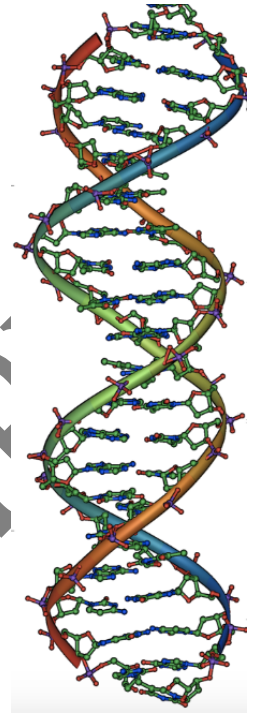
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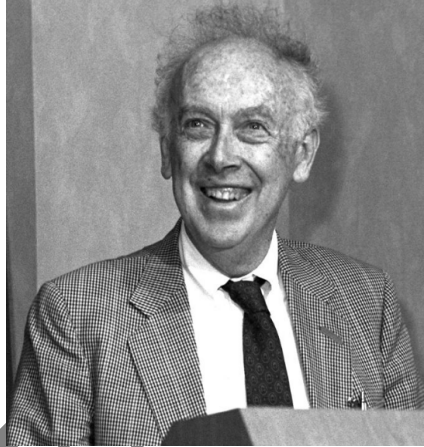
virus. Along with her colleagues, Franklin discovered that the genetic material of the tobacco mosaic virus was "embedded in the inner wall of its protective protein shell." The Royal Institution, a prestigious scientific institution, recognized Franklin's work and asked her to further her research on rod and spherical shaped viruses for the **World Fair Science Exhibition** in Brussels.

The Double-Helix Controversy

Franklin along with Francis Crick and James Watson are the centerpiece of one of the most famous controversies in science history. Crick and Watson received the Nobel Prize in 1962 for “uncovering” the structure of DNA. However, prior to their discovery, Watson took Photograph 51 from Franklin’s office without her knowledge and against her general wishes and examined it with Crick. Franklin did not want her work shared, especially with someone who had disrespected her as Watson had earlier. After her death, many began to note how Franklin was not even mentioned by Watson and Crick during their Nobel Prize acceptance even though Franklin’s photograph was instrumental in their discovery.



Francis Crick



James Watson

More controversy surrounded Watson in his dealings with Franklin. Watson once wrote about Franklin to Crick, stating, “I hope the smoke of witchcraft will soon be getting out of our eyes.” In

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Reading Comprehension Questions

1. What
2. Where did Franklin move to after receiving her Ph.D.? Why did she prefer this destination's environment to that of King's College in London?
3. From
4. What did Franklin study at King's College? What were her findings, be specific? What is ribose?
5. What
6. What
7. What was the name of Watson's book noted in the text? How did Watson depict Franklin in his book? What did colleagues think of his book and his accusations towards Franklin?

Extension Questions

8. What do you think about the controversy surrounding Franklin, Watson, and Crick? Do you think anything should be done today to rectify the situation and if so, what?
9. Research

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References

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