Rosalind E. Franklin and DNA: facts and myths

Zygmunt S Derewenda

Department of Molecular Physiology and Biological Physics, University of Virginia, Charlottesville, Virginia, USA

Zsd4n@virginia.edu

Keywords: Rosalind E. Franklin, history of crystallography, DNA double-helix

The second IUCr Congres in the summer of 1951 in Stockholm was attended, among others, by the 31-year-old Rosalind E. Franklin, who only months earlier took up a position at King’s College, London, to study fibrous DNA using X-ray diffraction. This was Franklin’s first exposure to world-stage of crystallography, although she used X-ray scattering to study amorphous coal while working in Paris in the Laboratoire Central des Services Chimiques de l’Ebat. She was in the audience at the lectures given by Lindo Patterson, who talked about his method of solving crystal structures, and John D. Bernal, who cautioned against the dangers of relying on modelling of chemical structures—a field championed by Linus Pauling—in the absence of solid experimental data. Franklin went back to London with that insight, to focus on the studies of the A form of DNA using the Patterson method.

Although Franklin made significant progress in her experimental and computational work in the next twelve months, she did not arrive at the correct structure. Her work stimulated James Watson and Francis Crick to build a generally correct model in March of 1953, as Franklin was moving to Birkbeck College to work on TMV. Her article on the DNA research was published along those of Watson and Crick and Maurice Wilkins’s, in April of 1953. It had not been well known, until Watson’s famous memoir, ‘The Double Helix’ brought her character into the limelight, with a regretfully sexist bias. By then, Franklin had been dead for nearly a decade, having passed away from ovarian cancer in 1958. Although numerous historical studies, biographies and autobiographies of almost all the protagonists—including Franklin’s younger sister—have by now given a full and accurate account of Franklin’s work and life, an independent trend evolved among some historians, authors, playwrights and even novelists, who created an image of Franklin as a woman betrayed by misogyny and antisemitism, a victim of the ‘Matilda effect’ whose ingenious and original work was misappropriated as a result of a conspiracy by Christian white men, and used without her knowledge as a primary source of information allowing to build the double helix. Among bolder statements found in press and on the internet, one can find that it was Franklin who discovered the double helix, that she discovered DNA as such, and that she died as result of her work with X-rays, a martyr who sacrificed her life for Watson’s and Crick’s Nobel.

While such sensationalist tales and conspiracy theories appeal to audiences and readers, and help sell books, they are based on misrepresentations of historical facts and often on outright falsehoods. My talk is intended to show the key facts behind the 1953 epochal discovery that are most often misrepresented and elements of the conspiracy theory that are not supported by any historical evidence. Rosalind Franklin was an outstanding scientist who ought to be remembered—as she would have wanted—for her great successes and legacy, not as a victim of a fictitious conspiracy.