James Watson, co-discoverer of DNA's double helix structure, dies at 97

Bryan Dyne
10 November 2025

James Dewey Watson, whose co-discovery of the twisted-ladder structure of DNA in 1953 helped launch a revolution in biology and medicine, died Thursday at age 97. He died in hospice care after a brief illness, according to his son Duncan Watson.

Watson shared the 1962 Nobel Prize in Physiology or Medicine with Francis Crick and Maurice Wilkins for discovering that deoxyribonucleic acid, or DNA, is a double helix consisting of two strands that coil around each other. That breakthrough, made when Watson was just 24 years old, instantly suggested how hereditary information is stored and how cells duplicate their DNA when they divide.

The discovery stands as one of the three most significant achievements in the history of biology, alongside Charles Darwin's theory of evolution through natural selection and Gregor Mendel's fundamental laws of genetics. It opened the door to developments such as genetic engineering, treating disease by inserting genes into patients, identifying human remains and criminal suspects from DNA samples, and tracing human ancestry. The double helix became an instantly recognized symbol of science itself.

This monumental scientific achievement occurred within a context of intense international collaboration and rapid technical advancement. The discovery did not emerge from isolated genius but from a collective scientific effort spanning decades and continents. And Watson's later years were marked by his embrace of discredited racial theories, creating a deeply contradictory legacy that reflects broader tensions within capitalist society between scientific progress and social backwardness.

Following the discovery, Watson spent two years at the California Institute of Technology before joining the faculty at Harvard in 1955. He created the university's program for molecular biology and remained there until 1976. He became director of the Cold Spring Harbor Laboratory on Long Island in 1968, transforming it into a center for cancer research and raising enormous funds. From 1988 to 1992, Watson directed the Human Genome Project, the federal effort to map human DNA.

At the same time, Watson's racist views often obfuscated his scientific achievements. In 2007, the *Sunday Times* magazine of London quoted him saying he was "inherently gloomy about the prospect of Africa" because "all our social policies are based on the fact that their intelligence is the same as ours—where all the testing says not really." He added that while he hoped everyone was equal, "people who have to deal with Black employees find this is not true." In a 2019 television documentary, Watson was asked if his views had changed. He replied, "No, not at all."

In the 1990s, Watson became a proponent of *The Bell Curve*, the 1994 book by Richard Herrnstein and Charles Murray that argued for a supposedly genetics-based theory of intelligence, claiming African Americans had less of it. Watson spoke often with co-author Charles Murray and embraced the book's arguments despite their being largely discredited by the scientific community. Watson attempted to justify these views through appeals to genetics, claiming that differences in DNA encoded certain deficiencies into specific races of human beings. He regarded DNA as the ultimate determinant of human capabilities, immeasurably more powerful than social and environmental forces.

It is thus all the more ironic that Watson's own work provided the scientific basis for undermining his own views. Numerous geneticists, including renowned figures like Richard Lewontin, have shown that there is very little genetic difference between races and that humans are one of the most homogeneous species in existence.

In other words, the development of the ability to think and understand the world is not bound up in the pseudo-scientific conception of "race" but is a social question, determined by how much a given society has advanced and developed. The contradiction that existed within Watson is representative of capitalism as a whole. Great scientific discoveries can be made and have been made in the 20th and 21st centuries, of which the discovery of the double helix structure stands at the height.

But purging human civilization of racism, sexism and all forms of chauvinism and nationalism is not a question that will be solved by science alone. It is a social and political question. The only solution is a political struggle against these reactionary ideologies, which means a turn by the working class to an understanding of its own history and objective laws of development and an uncompromising struggle against capitalism and for socialism.

Watson was born in Chicago on April 6, 1928, into what he called "a family that believed in books, birds and the Democratic Party." He entered the University of Chicago on scholarship at age 15, graduated at 19, and earned his doctorate in zoology at Indiana University three years later. He became interested in genetics at 17 when he read a book saying genes were the essence of life. According to one of his recollections, "I thought, 'Well, if the gene is the essence of life, I want to know more about it.' And that was fateful because, otherwise, I would have spent my life studying birds and no one would have heard of me."

It was in the fall of 1951 that Watson arrived at Britain's Cambridge University, where he met Crick. A Watson biographer noted, "It was intellectual love at first sight." Crick wrote that the partnership thrived in part because the two men shared "a certain youthful arrogance, a ruthlessness, and an impatience with sloppy thinking."

© World Socialist Web Site

The discovery of DNA's structure did not emerge from nowhere but from a collective scientific effort spanning decades. The milestones included Matthias Jakob Schleiden and Theodor Schwann's 1838 discovery of the cell as the fundamental unit of life, Darwin's 1859 publication of *On the Origin of Species*, Mendel's 1865 development of the foundations of modern genetics, T.H. Morgan's 1910 determination that genes are organized along chromosomes, and the 1942 establishment that genes are made of DNA.

In the late 1940s, Edwin Chargaff discovered that in DNA samples the amount of adenine equaled the amount of thymine and the amount of guanine equaled the amount of cytosine, strongly suggesting the pairing of nucleobases that would prove central to the double helix structure.

The immediate context of Watson and Crick's work was even more collaborative. Linus Pauling's group at the California Institute of Technology was within weeks of the discovery themselves but was sidelined by adhering to a triple-helix model, which Watson and Crick also considered for a time. Pauling had recently made a breakthrough discovery in 1951 when he identified the alpha helix structure in proteins, a major architectural scaffold that demonstrated the power of helical structures in biological molecules. The idea of helical structure was very much in the air. The question was the details.

The distinguishing of models depended on subtle chemical work rapidly evolving in many laboratories and on advances in x-ray crystallography, a tool to map out molecular structure. Watson and Crick had access to the best then-existing x-ray diffraction image of crystallized DNA, made by Rosalind Franklin and her graduate student Raymond Gosling. The Chargaff rules on base pairing provided crucial constraints. An important paper by Edward Ronwin proposed a solution to the problem posed in assembling the four known nucleobases in DNA because of their different sizes. The paper proposed the wrong structure, but gave an impetus to examining other variations and inversions, one of which turned out to be the correct one. The overall development of technique on several fronts made it inevitable that some team would uncover the structure of DNA within the year.

Crick had given Watson a copy of Pauling's 1930 work *The Nature of the Chemical Bond* for Christmas in 1951, thinking it would illuminate the problems they faced. Pauling himself might have made the discovery had the State Department not refused to renew his passport to allow him to travel to a British meeting on May 1, 1952, at which he was to be guest of honor and would have been able to speak with the x-ray crystallographers and perhaps see Franklin's work. Pauling's opposition to nuclear weaponry, as a man of the left, led the government to declare that his proposed travel "would not be in the best interests of the United States." He was told his "anti-Communist statements had not been sufficiently strong."

Public protest secured him limited travel ten weeks later, and he traveled to England. But he missed the May meeting and did not see the crystallographers. The dead-ends in DNA research, as he saw it, and not even knowing of the new higher-resolution x-ray images, had refocused his work on proteins. He would receive full passport renewal only in 1954 after winning the Chemistry Nobel Prize. Pauling would later become the sole recipient of the 1962 Nobel Peace Prize, the only person to win two full, unshared Nobel Prizes.

Watson and Crick built models to work out the molecule's structure. One Saturday morning in 1953, after arranging bits of cardboard he had cut to represent fragments of the DNA molecule, Watson realized how these pieces could form the rungs of a double helix ladder. According to accounts of the time, his first reaction was, "It's so beautiful." The pairing of purines with pyrimidines ensured a constant width for the DNA molecule, with adenine pairing with thymine through two hydrogen bonds and guanine pairing with cytosine through three.

Watson was later criticized for a disparaging portrayal of Franklin in his 1968 bestselling book *The Double Helix*, and today she is considered an example of a female scientist whose contributions were overlooked. Franklin died in 1958, four years before the Nobel Prize was awarded. Both of Watson's other Nobel co-winners, Crick and Wilkins, died in 2004.

The discovery of DNA's structure helped set the stage for the Human Genome Project, which Watson championed. The publication of the rough draft of the human genome sequence in 2000 was an outstanding scientific achievement, the outcome of an international collaboration spanning a decade and involving hundreds of scientists using advanced sequencing machines and powerful computers. By 2003, researchers had mapped 2.9 billion base pairs to an accuracy of 99.99 percent.

To date, 1,400 disease genes have been identified, enabling the production of targeted drugs and treatments. More than 350 new drugs derived from the research are currently undergoing tests. The project has produced medical breakthroughs and has potential to cure genetic diseases and offer deeper insights into human development and evolution.

The project demonstrated the potential of cooperative scientific endeavor organized on an international basis. It was finished two and a half years ahead of schedule and for considerably less than the estimated budget. The whole project stands as a refutation of the notion that private profit and competition are the only driving forces for scientific research.

The discovery of the double helix structure of DNA, and subsequent projects such as the Human Genome Project, represents a critical step in demystifying the evolution of the human species and the workings of the human body and confirms the ability of mankind to unravel the most complex scientific mysteries. This gain in human self-understanding stands in contrast to the irrationality of the present capitalist order, which is incapable of resolving the most basic social problems—poverty, disease, inequality, genocide, dictatorship and war.

To contact the WSWS and the Socialist Equality Party visit:

wsws.org/contact

© World Socialist Web Site