

## Topic Page: [Molecular Biology](#)

Definition: **molecular biology** from *Philip's Encyclopedia*

Biological study of the make-up and function of molecules found in living organisms. Major areas of study include the chemical and physical properties of proteins and of nucleic acids such as DNA. See *also* biochemistry



Image from: [F H C Crick, in about 1954. in The Cambridge Dictionary of Scientists](#)

Summary Article: **molecular biology**

From *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

Study of the molecular basis of life. This branch of biology is primarily concerned with the structure, function, and interaction of the macromolecular components of living cells, including DNA, RNA, and protein molecules, in order to answer wider biological questions.

While there are no clear boundaries between molecular biology and biochemistry on one side and genetics on the other, molecular biology typically uses analysis and manipulation of genes to address biological questions

concerning the corresponding proteins, or biological functions at cellular or higher level. In contrast, biochemistry aims more at studying the proteins (or other biomolecules) concerned, while genetics is mainly concerned with the gene specifically and the regulatory elements around it.

The discovery of the double helix structure of DNA by biologists Francis Crick and James Watson is often seen as the beginning of modern molecular biology. Later on, the field was defined by a set of key tools, including: restriction enzymes, which allow researchers to edit DNA and clone genes into the genomes of bacteria; the polymerase chain reaction (PCR), which makes it possible to produce large numbers of copies of a very small sample of DNA; site-directed mutagenesis (introduction of specific mutations into the DNA of a living organism); high-throughput screening methods such as microarrays, where thousands of DNA or RNA molecules are attached to a small surface and can be manipulated and analysed simultaneously; high-throughput gene sequencing as used in the genome projects; and RNAi, which is used to specifically and reversibly silence a gene of interest.

Application of such tools has been extremely successful since the 1980s, revolutionizing the way in which biochemical and biological questions are addressed, to an extent that now most life sciences research will involve some methods of molecular biology.

### **essays**

Biology

DNA: Discovery of the Structure of DNA

### **images**

Milstein, César

### **APA**

Chicago

Harvard

MLA

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molecular biology. (2018). In Helicon (Ed.), *The Hutchinson unabridged encyclopedia with atlas and weather guide*. Abington, UK: Helicon. Retrieved from [https://search.credoreference.com/content/topic/molecular\\_biology](https://search.credoreference.com/content/topic/molecular_biology)

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## Chicago

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## Harvard

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## MLA

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