20th-Century Medicine Books

Genetics and Biotechnology Books

The discovery of genes and their role in heredity and disease was one of the most important medical advances in history. In 1953 British biophysicist Francis Crick and American biochemist James Watson identified the double-helix structure of deoxyribonucleic acid (DNA). This discovery helped to explain how DNA carried genetic information. In the 1960s American biochemist Marshall Nirenberg added key details about how DNA determines the structure of proteins.

Indian-born American biochemist Har Gobind Khorana was the first to synthesize a gene in the laboratory in 1970, forging the way for scientists to develop ways to isolate, alter, and clone, or copy, genes. They applied these genetic engineering techniques to the diagnosis and treatment of diseases. Researchers identified genes associated with cancer, heart disease, mental illness, and obesity. With the genes identified, they worked on ways of modifying the genes to treat the disease. Gene therapy emerged as an experimental medical field that used genetically modified genes to treat diseases. In 2003 scientists completed the sequence of the human genome, in which they identified all the genes needed to make a human being.

Genetic engineering techniques enabled production of scarce human hormones and other materials for use as drugs. A new biotechnology industry started producing these materials for medical use. Scientists also began genetically modifying sheep and other animals to produce drugs in their milk.