

THE CHILD OF BIOLOGY AND CHEMISTRY

Biochemistry is one of developing branches of biology as well as chemistry.

Biochemistry may be defined as the chemistry of living organisms, from the most primitive to very complicated ones, including human beings.



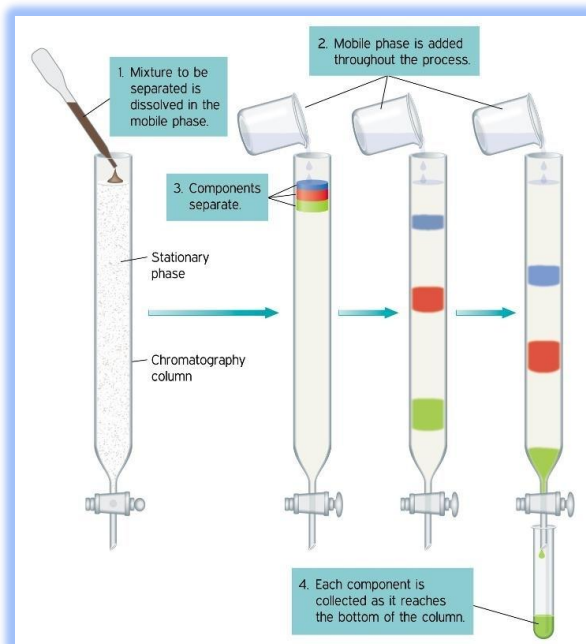
Areas of Study

The research into the chemistry of organisms may be considered from three aspects. The first involves a study of the composition of organisms. Such a research is the essence of static biochemistry. The second aspect deals with all the complex transformations of substance. This is research into dynamic biochemistry. The third aspect has the aim of

elucidating the biological significance or the physiological importance of chemical reactions in an organism. We call it functional biochemistry.

Methods of Biochemistry

1) Chromatography is a physical and chemical method for separating liquid or gaseous mixtures based on the distribution of their components between two immiscible phases, one of which is stationary (liquid or solid), the other is mobile (gas or liquid) and flows continuously through the stationary phase. This method is indispensable in the analysis of pharmaceutical preparations, mixtures and substances of natural origin.



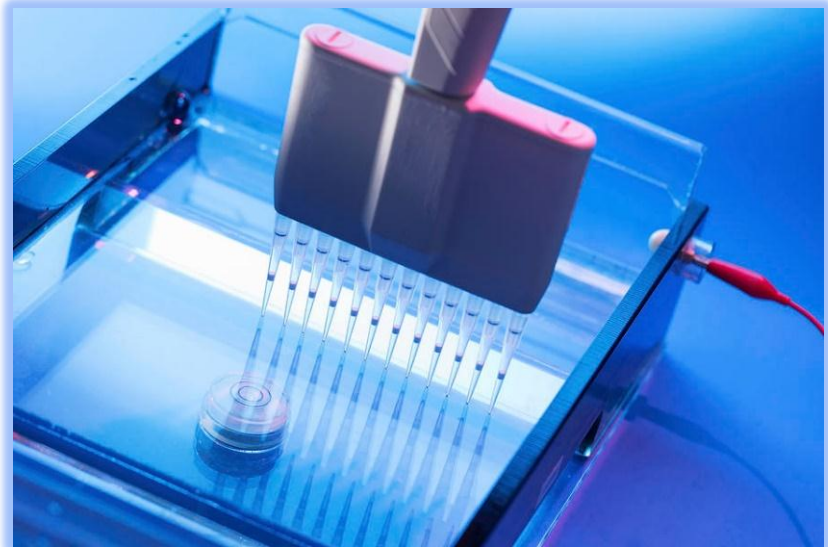


2) Centrifugation is the process of separating heterogeneous systems in the field of centrifugal forces using solid or liquid-permeable partitions. Centrifugation processes are carried out in centrifuges. During ultra-high-speed rotation, a centrifugal force occurs in the system, which contributes to the separation of the processed substance by density. The method of centrifugation is used in science

and medicine, industry, agriculture, in everyday life and in technological fields.

3) Electrophoretic method

in biochemistry is a method of spatial separation of molecules with different charges and sizes by placing them in an electric field. An electrophoregram is a picture obtained after separation of a complex mixture by electrophoresis and specific manifestation. Electrophoregram of proteins of human biological fluids allows doctors to obtain significant diagnostic information.

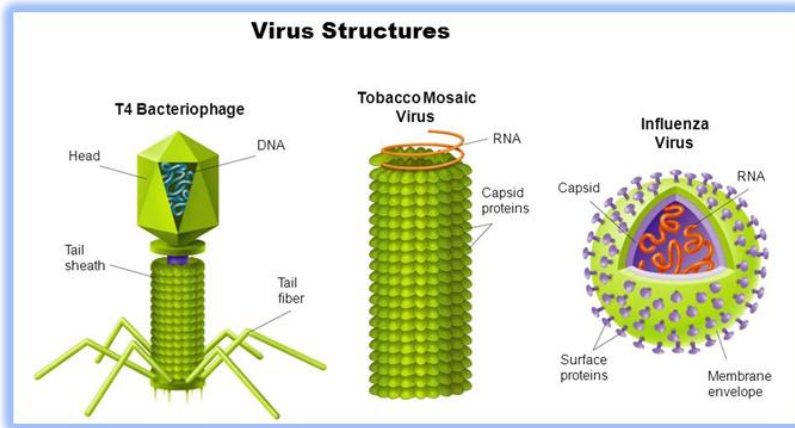


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Important Biochemical Discoveries

Vitamins are of great interest for biochemistry, since they are involved in a variety of biochemical reactions. They were discovered by the Russian scientist, N. I. Lunin in 1880. Deciphering the chemical structure of vitamins in 1940 made it possible to organize industrial production of vitamins not only by processing products, but also artificially, by their chemical synthesis.

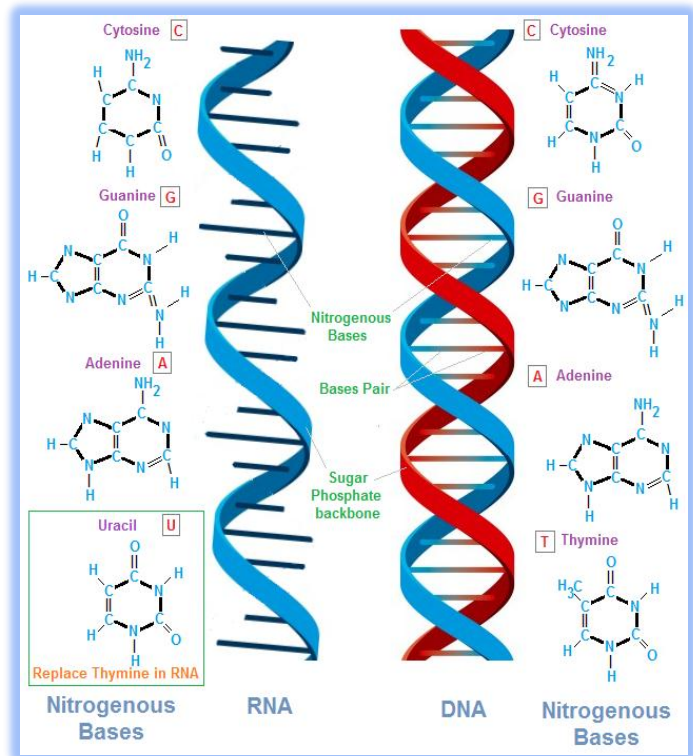
Fischer's research represented an epoch in the development of biochemistry. He created a peptide theory that gave the key to the mystery of protein structure. Fischer suggested that proteins are polymers of amino acids connected by a peptide bond. He established the structure and properties of almost all the amino acids that make up proteins.



An important achievement in biochemistry was the study of the structure of viruses — microscopic particles that are molecules of nucleic acids (DNA or RNA) enclosed in a protein envelope and can infect living organisms. The honor of the discovery of viruses belongs to D. I. Ivanovsky (1892).

The most important data on the structure, properties and conversion of nuclear acids were discovered by A. N. Belozersky and his colleagues. Belozersky proved the unfairness of dividing nucleic acids into “plant” and “animal” ones. In 1936, he first discovered DNA in plant cells. This discovery was of fundamental importance — DNA was considered a universal biological material.

In 1953, J. Watson and F. Crick proposed a spatial model of the structure of DNA that explains all its properties. According to the proposed model, the DNA molecule consists of two complementary chains. Knowledge of the structure of DNA has become the key to understanding the principles of transmission of inherited information.



The Importance of Biochemistry

A comprehensive study of the “chemistry of life” is being carried out not only by biochemists, but many representatives of related sciences — biophysicists, microbiologists, and doctors. At the same time, it is impossible to imagine any science that would not do without the achievements of biochemistry. It can be considered the main language of all biological sciences, it continues to develop and make an invaluable contribution to the understanding of many important biological issues.