

Annotation

Molecular biology

Molecular biology is a fundamental science. It studies the relationship between genetic information and the characteristics of an organism, which are realized with the help of proteins. The main processes that are studied in molecular biology are replication, transcription and translation. It is thanks to them that the transfer and implementation of hereditary information occurs, and the offspring gets the same traits as the parents. Molecular biology gave a powerful impetus to the emergence and development of applied areas in biotechnology, genetic engineering, diagnostics, gene therapy, etc. Molecular biology studies the structure of nucleic acids; canonical and non-canonical forms of DNA; stabilization of the secondary structure of DNA; DNA replication of prokaryotes, eukaryotes, re-replication; the types of DNA damage they cause mutations, forms of direct and indirect reparation; nucleosomes, histones, non-histone proteins; chromatin packing levels; telomeres; general principles of regulation of the cell cycle in a normal cell, comparison with tumor cells; initiation and regulation of transcription in prokaryotes; features of transcription and regulation of transcription in eukaryotes; maturation of pre-mRNA; capping, polyadenylation, splicing, alternative splicing; types of RNA, miRNA, origin, biogenesis; translation of pro- and eukaryotes, regulation and levels of regulation of all major processes, co- and post-transcriptional and translational modifications.