

Properties of the gene.

A gene is a structural and functional unit of hereditary information. It is a section of a DNA molecule. It contains information about the sequence of amino acids in a polypeptide, the sequence of nucleotides in rRNA or tRNA. In other words: the gene encodes the structure of a polypeptide, rRNA or tRNA.

Properties of the gene

1. Stability.

In the absence of mutations, the gene remains unchanged and is passed down through the generations in its original state. This is the basis of the fundamental property of living systems – heredity.

2. Lability or mutability.

It is provided by the ability of the gene to change with the appearance of new alleles and new genes. Ensures the existence of a fundamental property of living systems – variability.

3. Allelism.

Genes exist in the form of different variants or alleles. The alleles of the gene are located at identical loci of homologous chromosomes. Most often, a gene has 2 alleles. There is a special phenomenon - multiple allelism. In this case, the gene has 3 or more alleles. Example: genes encoding the formation of blood groups of the ABO system. In this case, the gene has 3 alleles. Mutations are the reason for the formation of different alleles. The presence of various alleles contributes to the formation of genetic and phenotypic polymorphism.

4) Discreteness.

Each gene carries a specific piece of information and ensures the formation of a specific molecule.

5) Pleiotropy.

A gene provides the formation of one trait and affects other traits or the functioning of other genes. Pleiotropy may be related to the modifying properties of a gene or to the polyfunctionality of the protein encoded by it.

6) Dosage.

Normally, the dose of each gene is strictly fixed in the genotype. In other words, there are a certain number of copies of a gene in the genome. Therefore, both an increase and decrease in the dose of the gene can lead to the development of pathological conditions (for example, trisomy, polyploidy).

7) Genes are capable of interaction.

There are different ways allelic and non-allelic genes interact.