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## CONTENT OF GENETICS AND STAGES OF DEVELOPMENT

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**ABSTRACT:** Genetics is derived from the Greek word "geneticos", which means birth, origin. Genetics is the science of heredity and variability of living organisms and is considered a separate branch of biology. Heredity is a property that forms the basis of all life phenomena and ensures the transmission and development of similar characteristics of living organisms from generation to generation under certain environmental conditions. Variation is the property of living organisms to manifest new characteristics that differ from the parental characteristics.

**KEYWORDS:** Genetics, development, stage, external environment, genetic studies.

### INTRODUCTION

One of the main methods of genetics is hybridization, that is, obtaining a hybrid individual by crossing organisms that differ from each other with opposite characteristics. The scientist who first used this method in his research was the German botanist I. Kelreiter. He made a direct and reciprocal cross between the two species of tobacco plant, *N. rustica* and *N. paniculata*, and it is known that the seed and pollinator plants are of equal value in transmitting the hereditary characters to the next generation. did Kelreiter's research in the field of hybrid organisms was developed by the English botanist T. Knight.

### THE MAIN RESULTS AND FINDINGS

He investigated the inheritance of certain characters by crossing fruit trees and different varieties of peas, unlike Kelreiter, and when the first cross was made, some characters of pollinating and seed-bearing plants were observed in the first generation, such as the red color of the pea flower, grain size. discovered the preservation of the grayness of sti, the disappearance of others.

The French horticulturist O. Sajre was one of the first in the history of science to study the inheritance of some traits of pollinating and pollinating plants and noted that pollinating and pollinating plant traits do not mix and disappear during breeding, but redevelop. did

French botanist Sh. And Noden cross-breed various types of trees, fruit trees, ornamental plants and proved that in the first generation hybrids one character is dominant over the other, and sometimes characters are inherited intermediately.

G. Mendel, while highly evaluating the research work of his predecessors, published in 1865 in his work entitled "Researches on hybrids of offspring" stated that until now the general laws of the development of plant hybrids have not been determined, and in order to find an absolute solution to this problem, various methods have been used. He emphasized that it is necessary to carry out

extensive experiments on plant hybrids and to carefully calculate the various forms that appear in the generations, and finally to determine their mutual ratio.

Despite the extensive research conducted by Mendel and the discovery of the laws of heredity, the results of his research were not recognized and appreciated in time.

In the formation of genetics as a science, the researches conducted in the field of cytology, embryology, and biochemistry became important.

In the official recognition of genetics as an independent science in 1900, the work of Dutchman De Vries, German Carl Korrens and Austrian Erich Chermak on hybridization was of great importance. These three botanists, without knowing each other, conducted research on various objects (De Friz enotera and lavender, K. Korrens corn, E. Chermak pea hybrids) and studied the genetic characteristics of parents. published their articles on the inheritance and separation in future generations. But these scientists only "rediscovered" the laws of heredity discovered by the Czech naturalist Gregor Mendel. Because Mendel's laws of heredity were described in his work titled "Experiments on Plant Hybrids" published in 1865. Therefore, G. Mendel is rightly considered the founder of genetics.

The development of genetics consists of three stages. In the first stage, the science of heredity and variation was named genetics by the English scientist U. Bateson in 1906.

In the development of genetics, the theory of mutation proposed by the Dutch scientist De Vries (1901-1903) and the research conducted by the Danish geneticist V. Johannsen on the inheritance of characters in the bean plant became important. In 1909, V. Johannsen introduced concepts such as gene, genotype, phenotype into the science of genetics.

In the first decade of the development of genetic science, the chromosomal theory of heredity was founded by T. Boveri, U. Setton and E. Wilson. It was found that there is a certain connection between the distribution of chromosomes in the process of cell division (mitosis) and the formation of germ cells (meiosis) and hereditary characteristics.

The second stage of the development of the science of genetics is related to the study of the material foundations of heredity. At this time, the cytological method began to be used in the study of hereditary phenomena, and as a result, the cytogenetic direction was formed.

In 1910, the research conducted by the American geneticist T. Morgan on the *Drosophila* fruit fly was of decisive importance in establishing the chromosomal theory of heredity. According to this theory, genes are located in a linear order on the chromosome. It was found that the combination group of genes in the cell is equal to the haploid set of homologous chromosomes, and the genes combined in one group are transmitted from generation to generation independently of the other group.

In 1925, G.A. Nadson and G.S. Filippov succeeded in obtaining mutations in yeast under the influence of radium rays. In 1927, the American geneticist G. Meller exposed X-rays to *Drosophila* fruit flies and proved that it is possible to change their heredity, that is, to create mutations artificially. English scientist Sh. Auerbach and the Russian scientist I.A. Rapoport proved that mutations can be obtained by exposing organisms to strong chemicals. In the 20s and 30s of the 20th century, S. Wright and R. Fisher proved that it is possible to study the processes in populations using mathematical methods.

The third stage of the development of the science of genetics is characterized by the application of methods of chemistry, physics, mathematics and cybernetics to genetic research. In particular, the structure of fungi, bacteria and viruses from microorganisms, the function of some organoids, the structural structure and function of proteins, enzymes, vitamins are studied by using electron microscopy, X-ray structural analysis, differential centrifugation, radioactive isotope, microsurgery methods. started

By the 40s of the 20th century, American biochemists D. U. Biddle and E. Tatum studied the influence of genes on metabolism, the formation of morphological signs and physiological characteristics of living organisms in their research on the neurospores of fungi.

In 1944, geneticist O. T. Avery together with his students proved that nucleic acids are the material basis of heredity. After the genetic importance of DNA was determined, in 1953, D. Watson, F. Crick, M. Wilkins, R. Franklin summarized the analysis of the data on the X-ray structures of nucleic acids and concluded about the structure of the DNA molecule. announced the model.

In 1961-1962, M. Nirenberg, G. Mattei and F. Crick determined the composition of the triplet of nucleotides for 20 amino acids, and as a result, the genetic code became known. In 1969, the Indian scientist H. Korana carried out the gene synthesis of the yeast cell in the laboratory. With the development of molecular biology and biochemistry, new branches of genetics, such as molecular genetics, gene engineering, and biotechnology, were formed. By the beginning of our century, the full resolution of the DNA sequences (sequence) of the DNA sequences of the genomes of several dozen microorganisms, many animals, humans and plants, i.e. the set of genes in the haploid sets of chromosomes, led to the formation of the science of genomics.

## CONCLUSION

Studying the structure of the gene later showed that some of its parts are made up of coding exons and non-coding introns. By 1974-1975, geneticists working in the field of molecular and biochemistry laid the foundation for genetic engineering. By the end of the 1970s, it was discovered that some genes in the genome change their place and move. As a result, it was experimentally proven that some genes can be artificially synthesized and transferred from one cell to another, and transgenic plants and animals were obtained. In 1997, Ya. A team of scientists led by Wilmuth succeeded in artificially producing lambs by inserting the nucleus of one sheep into the gametes of another sheep.

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