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## **GENETIC ENGINEERING**

The purpose of genetic engineering is to make organisms do what we want them to. We can make an organism produce a certain protein that we need for that organism to function in a different way, or splice genes that code for proteins we want into organisms to then isolate that protein. We can also knock out genes to stop organisms from doing certain things that we don't want them to do (mostly for research purposes - to find out what that gene does). Genetic engineering could theoretically be used to cure a very broad range of diseases. [1]

The objects of genetic engineering research are viruses, bacteria, fungi, animals (including the human body) and plant cells.

Genetic engineering methods allow to carry out genetic certification, diagnose genetic diseases, create DNA vaccines, conduct gene therapy of various diseases.

The technology of recombinant DNA uses the following methods:

- specific DNA cleavage by restriction nuclease, accelerating the isolation and manipulation of individual genes;
- construction of recombinant DNA;
- introduction of recombinant DNA into cells or organisms.

Now they know how to synthesize genes, and with the help of such synthesized genes introduced into bacteria, a number of substances are obtained, in particular hormones and interferon. Their production constituted an important branch of biotechnology. [2]

Today, successes and achievements are visible to the naked eye. If we consider such a sphere of human activity as agriculture, then genetic engineering has achieved the most impressive results.

Since the beginning of the 1980s, many genetically modified varieties of grain crops have been obtained. By the end of the first decade of the 21st century, they planted 120 million hectares of land all over the world. The high level of yields, its tremendous resistance to unfavorable climatic conditions and the complete absence of parasites devouring cereals for humans are noted.

Unprecedented varieties of potatoes, corn, soybeans, rice, rapeseed, cucumbers have been brought out. The number of plant species in which genetically engineered methods have been successfully applied exceeds 50. Transgenic fruits have a longer maturation period than conventional crops. This factor is good for transportation, when you do not need to be afraid that the product will overripe.

Animal husbandry is also in the zone of genetic engineering interests. Studies on the creation of transgenic sheep, pigs, cows, rabbits, ducks, geese, chickens are now considered to be priority. Here, much attention is paid to animals, which could easily synthesize various medications: insulin, hormones, interferon, amino acids.

So genetically modified cows and goats could give milk, which contained the necessary ingredients for the treatment of such a terrible disease as hemophilia. Insulin, antitrypsin can also be obtained with a nutritious white liquid. Do not forget about the cost. The creation of this type of biological medicines will cost 20 times cheaper than the production of appropriate medicines with the help of traditional chemistry.

Successfully conducted work on the regulation of the metabolism, on which the performance depends directly. In sheep breeding it is quite possible to create animals prone to rapid growth of wool. Mass output of large breeds of pigs is a matter of the next few years. The same applies to poultry.

Do not discount the fight against dangerous viruses. Genetically resistant to various infectious diseases, living creatures already exist and feel very comfortable in the environment. These include rabbits that began to forget what leukemia is.

But for sure the most promising in genetic engineering is the cloning of animals. This term is understood (in the narrow sense of the word) to copy cells, genes, antibodies and multicellular organisms in the laboratory. Such specimens are

genetically the same. Hereditary variability is possible only in the case of random mutations or, if created artificially.

Due to cloning it is possible to reproduce very valuable from one or another point of view of the individual. It can be representatives of breeds of cattle, sheep and pigs, and racehorses, and rare breeds of dogs. An example of such a process is the Dolly sheep, successfully cloned from the cell of another adult creature. She was born in the UK on July 5, 1996, lived six and a half years and died on February 14, 2003.

[3]

I think commercial advantages of genetic engineering are quite high and further research will be able to possibly solve many of our health and poverty related issues. This is the biggest argument in the favor of engineering. Even so, it takes a lot many years to fully understand genetic engineering.

#### REFERENCES:

1. Desmond S. T. Nicholl. An Introduction to Genetic Engineering (Third Edition). The basis of genetic engineering. [Electronic resource] /Desmond S. T. Nicholl/ – [Cambridge: Cambridge University Press] – Mode of access: World Wide Web: [http://tootshamy.com/albums/userpics/10002/Introduction\\_to\\_Genetic\\_Engineering.pdf](http://tootshamy.com/albums/userpics/10002/Introduction_to_Genetic_Engineering.pdf). – Title of the screen
2. Desmond S. T. Nicholl. An Introduction to Genetic Engineering (Third Edition). The methodology of gene manipulation. [Electronic resource] /Desmond S. T. Nicholl/ – [Cambridge: Cambridge University Press] – Mode of access: World Wide Web: [http://tootshamy.com/albums/userpics/10002/Introduction\\_to\\_Genetic\\_Engineering.pdf](http://tootshamy.com/albums/userpics/10002/Introduction_to_Genetic_Engineering.pdf). – Title of the screen
3. Desmond S. T. Nicholl. An Introduction to Genetic Engineering (Third Edition). Genetic engineering in action. [Electronic resource] /Desmond S. T. Nicholl/ – [Cambridge: Cambridge University Press] – Mode of access: World Wide Web: [http://tootshamy.com/albums/userpics/10002/Introduction\\_to\\_Genetic\\_Engineering.pdf](http://tootshamy.com/albums/userpics/10002/Introduction_to_Genetic_Engineering.pdf). – Title of the screen