

# Moral Problems of Gene Therapy

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## **Abstract**

Increasing progress of medical genetics is accompanied by numerous moral and juridical problems, solving of which is associated with great human pain and conceiving values of the mankind. This problem became more acute after conducting reproductive cloning. Using of screening programs for genetic diseases often there is a moral conflict, associated with observing of the confidentiality and fulfillment of obligations, which makes the physician obliged to tell the patient about possibility of heavy disease. At the same time medical-genetic aid is a right of each human, what, correspondingly should be guaranteed by the state. It is necessary to ensure existence of personal choice of the citizens, protection of ineffective persons. Usage of genetic information as a basis for national, ethnic, economic, political or other discrimination shall be prohibited.

**Keywords:** *bioethics, gene therapy, eugenics, human population, mono-gene diseases, gene mutation, human genome, multi-factor pathologies*

**C**reation of new opportunities for manipulation with genetic information to improve inherited features of an individual or prevent genetic diseases provide assistance for rehabilitation of eugenic principles, what was quite widely spread in biologists and politicians in the end of the 19th and in the beginning of the 20th century.

Memories, associated with abuse of eugenics in the beginning of 20th century condition the negative reaction of modern scientific and medical communities to the proposals associated with development state policies regarding human population. Though non-interference of the state in these conditions imply strengthening of the market power.

Risk of negative results of irresponsible applying of genetic information determine specific significance of the principal "Do not harm". In the human genetics, as in other spheres of the science the hypotheses and theoretical models without serious empirical confirmation and theoretical substantiation occupy quite significant position.

In this connection we should take into account that scientific hypotheses, when they find their place in mass cognition, are no more under the control of strict mechanisms of selection, obtain their own life, provide

motivation and guide social actions, which often have non-ultimate results. The scientists should be well aware of the damage, which can be an outcome of "freeing" of the wrong or not enough developed hypothesis.

Based on the moral principle "Do not harm", scientific hypothesis with significant social results should be particularly strictly selected and tested. This principle is also very important in considering issues of gene therapy.

Moral problems of gene therapy in bioethics are one of the most complicated issue, regarding its' specific features. Gene therapy is one of the most modern directions of development of the medicine. Currently hundreds of patients have used it, though in many cases with quite heavy results. The method is based on transmission of genetic materials through virus or protobe carriers, or through isolated in the laboratory cells of the patient, which then will be grafted to him.

Applying of gene therapy for treatment of mono-gene heritable diseases regarded as comparatively successful, as it is easier to restore of mutation of single gene and correspondingly shifting of a single gene. It is proposed that introducing of genetic material with normally functioning gene, into the human body will

cause significant therapeutic effect. Development of gene therapeutic methods for treatment newly created cancer can also provide positive results. It is hoped that effective gene therapeutic method can be developed for AIDS treatment. Prospects of gene therapy for multi-factor pathologies, like cardiovascular diseases. Though even here genetic correction is possible in the cases of revealing bottlenecks of the disease, which, at any rate will allow decelerating progress of the pathology. Though it should be noted that no existing methods of gene therapy could be regarded as developed and reliable. Successful cases, causing enthusiasm and delight were changed by tragic falls, what was followed by demands to eliminate this dangerous practice. This situation is quite natural, regarding that for example clinical development of methods for transplantation of spinal cord and internal organs, which now are routine and widely practiced, required about quarter of century.

Therefore we can easily propose that gene therapy will not eliminate experiments and hence it is necessary to apply legal and ethical norms regulating researches in this sphere. As gene therapy is associated with interference into comparatively intimate mechanisms, policies of the countries, which establish special committees is justified. To provide expert examination of all orders for conducting experiments and clinical researches bioethical committees are staffed with independent experts and community representatives.

Currently situation with accounting of negative phenomena in human body as a result of transmitting genetic materials into the patient's body is quite unclear and the same is with assessment of effectiveness of gene therapy. Therefore restriction of research of human genitals by the method of gene therapy is internationally recognized. Thus they attempt to avoid inheriting of potential undesirable genetic changes and their dissemination through future generations. At the same time it should be regarded that the genital cells are not isolated in the body. So there is some probability of influence of genetic material on genital cells in the process of genetic therapy of somatic cells.

To obtain permission on clinical experiments in the sphere of gene therapy necessity of meeting of following conditions is internationally recognized:

1. In the experiments on animals it is necessary to justify that the necessary gene can be transferred to

corresponding target cell, where it will be functionally active for a long time.

2. It should be ensured that gene transmitted into the new environment will maintain its' effectiveness.

3. Absolute guarantee is necessary to ensure that transmitted gene will not cause undesirable results.

Though quite clear, these conditions cannot be specific enough to become a universal rule. In each case of applying of gene therapy one should determine what terms can be regarded to be enough for maintaining of gene effectiveness, what potential risk endanger the patient and how it will be related with positive therapeutic effect.

Such specific scientific and moral analysis will be more successfully implemented within the framework of so called "Ethical Committees". On one hand participation of independent experts in such committees will allow scientific and unbiased assessment research methods. On the other hand participation of specialists of ethics, lawyers and others (community representatives) will provide overcoming lack of civil education, what is so characteristic for so many people and even for scientists, quite competent in their spheres.

During last decades in the sphere of genetics and practical application of genetic knowledge necessity of ethical and legal regulation obtained great significance. Regarding this many international and national organizations attempt to create new legal and moral standards. Among them, first of all we should admit: documents of the World Health Organization - WHO "Program of Human Genetics", "Convention on Human Rights and Biomedicine" adopted by Euro Commission in 1996; recommendations of International Organization of Human genome, Declaration of WHO of 1992, UNESCO Declaration on Human Genome, adopted in 1997.

All these documents share the conception that medical genetic aid should be the right of each person, what will be guaranteed by the state. At the same time it is emphasized that confidentiality of genetic information, freedom of personal choice of the citizens, protection of incapable people shall be ensured. Application of genetic information for national, ethnic, economic, political or other kind of discrimination is prohibited.

## References

1. Bakhtiarova V.O. "Artificial Children". Bioethics - principles, issues, problems. Editorial URSS, Moscow, 1998.
2. Dokinz R. Selfish gene. M. 1993. Siluianova I.V. Sexual Liberalization // Nezavisimaia gazeta (Independent newspaper) 1995.
3. Encyclopedia of Bioethics. v. 1-5, Reich W.Th. (Editor-in-chief). N.Y., 1995.
4. The Ethical & Legal aspects of the project "Humane Genome". International documents and analytical materials. Yudin B.G. M. 1998.
5. Gudkov L., Tishenko P., Yudin B. Human genetic improvement: a comparison of Russian and British public perception // Bulletin of Medical Ethics. Dec. 1997/ Jan. 1998. N134, p. 20-23.
6. Herrnstein R.S., Murray Ch. The bell curve. Intelligence and class structure in American Life. N.Y. 1994.

## Моральные проблемы генной терапии

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### РЕЗЮМЕ

Неуклонный прогресс медицинской генетики сопровождается многими проблемами морального и юридического характера, решение которых связано с большой человеческой болью и переосмыслением общечеловеческих ценностей. Эта проблема приобрела особую актуальность после осуществления репродуктивного клонирования. При использовании программ скрининга генетических заболеваний часто возникает моральный конфликт, что связано с соблюдением правил конфиденциальности и выполнением обязательств, которые обязывают врача-генетика сообщить пациенту о возможности возникновения тяжелого заболевания. Желание пациента о согласии или отказе на получение генетической помощи должно быть гарантировано государством. Необходимо обеспечить возможность личного выбора для граждан, защиту недееспособных лиц. Применение генетической информации, как основание для национальной, этнической, экономической, политической или другого рода дискриминации, должно быть запрещено.

**Ключевые слова:** *генная терапия, евгеника, человеческая популяция, моногенное наследственное заболевание, генная мутация, человеческий геном, мультифакториальные нарушения*