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**ДОСТИЖЕНИЯ В ОБЛАСТИ ИММУНОТЕРАПИИ: РЕВОЛЮЦИЯ В ЛЕЧЕНИИ
РАКА И ЗА ЕГО ПРЕДЕЛАМИ С ПОМОЩЬЮ ТАРГЕТНОЙ ТЕРАПИИ**

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В последние годы достижения в области иммунотерапии произвели революцию в подходе к лечению рака. Таргетная терапия, направленная на специфические мишени в иммунной системе, открывает новые возможности для борьбы с этим заболеванием, позволяя усиливать естественные защитные механизмы организма, делая лечение более эффективным и безопасным. Её применение может привести к значительным прорывам в лечении других заболеваний, включая аутоиммунные и инфекционные.

Ключевые слова: таргетная терапия, рак, злокачественные новообразования

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**ADVANCEMENTS IN IMMUNOTHERAPY: REVOLUTIONIZING CANCER
TREATMENT AND BEYOND WITH TARGETED THERAPIES**

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In recent years, advances in immunotherapy have revolutionized the approach to cancer treatment. Targeted therapy aimed at specific targets in the immune system opens up new opportunities to combat this disease, allowing you to strengthen the body's natural defense mechanisms, making treatment more effective and safer. Its use can lead to significant breakthroughs in the treatment of other diseases, including autoimmune and infectious ones.

Key words: targeted therapy, cancer, malignant neoplasms

In Russia, the primary incidence of cancer is steadily increasing [1]. For example, the International Agency for Research on Cancer in 2020 reported about 10 million deaths from cancer. The most common were carcinogenic diseases of the lungs, liver, stomach, breast, and intestines [2]. This was a stimulant for the discovery of a new therapeutically useful tool - targeted therapy, which allows targeted action on such targets in the body's immune system as growth factors and their receptors for epidermal growth (EGF), vascular endothelial growth (VEGF), as well as proteins necessary for conducting myogenic signals from receptor molecules and other structures that control the process of programmed cell death (apoptosis) (Bcl2, p53, etc.) and angiogenesis (the process of formation of blood vessels).

The main difference between targeted drugs and "classic" drugs is their directed action on structures that support and develop the process of carcinogenesis. "Classical" drugs, having specificity, act on general biological processes for both healthy and tumor cells of the processes – mitosis and reduplication of DNA molecules. Thus, targeted molecules have a cytostatic effect, while "classic" molecules have a cytotoxic effect.

Targeted therapy may include blockade of circulating ligands; inhibition of ligand binding to the extracellular domain of the receptor; blockade of phosphorylation of the intracellular domain,

which leads to disruption of signal transmission within the cell; intracellular suppression of protein structures necessary for signal transmission [3].

In addition to the positive features of these drugs, there are also negative ones. One example is the toxicity, which is peculiar and different for each of the drugs. Thus, when acting on the structures of the vascular and hematopoietic system, skin rash, diarrhea, allergic reaction, general condition disorders, fatigue may occur. It is also possible to develop hemorrhage, arterial hypertension, and thromboembolic complications.

To study the effectiveness and positive digestibility of drugs, clinical trials are conducted, the methodology of which is based on the registration and study of the progression and survival of patients. First, this is due to the cytostatic feature of targeted therapy molecules.

After the introduction of these drugs into medical practice for the treatment of tumor diseases of lymphoid and hematopoietic tissue, significant changes in the positive side were registered.

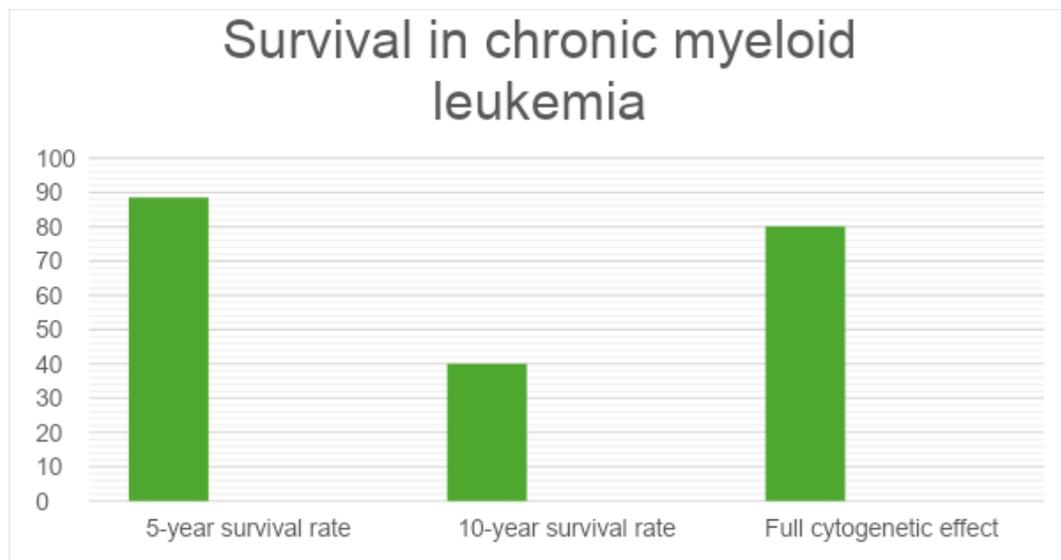


Fig. 1. The most pronounced effect of drugs of this group is manifested when they are exposed to tumors of a solid group.

In recent decades, the field of immunotherapy has undergone revolutionary changes that have had a significant impact on the treatment of cancer. The development of targeted therapy methods has led to new opportunities in the fight against cancer, allowing targeted action on tumor cells and stimulating the body's immune system to destroy them. These achievements have opened new horizons in medicine, expanding the possibilities of treating not only oncological, but also other serious diseases. However, it is important to remember that further development of immunotherapy requires continued scientific research and clinical trials to ensure maximum effectiveness and safety of new treatments.

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