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Тезис

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**The molecular basis of carcinogenesis***Saratov State Medical University n.a. V.I. Razumovsky, Department of Foreign Languages*

**Relevance.** During last decades cancer has taken an enormous scale and has become the second disease in the world by the degree of its prevalence. For more successful cancer treatment and for the creation of medicines, it is necessary to know the causes of degeneration at the molecular level.

**Objective:** understanding of the fundamentals of carcinogenesis

*The molecular basis of carcinogenesis*

Targets of carcinogenic agents are four classes of genes:

1) proto-oncogenes, regulators of proliferation and differentiation of cells;

The relationship of these genes with carcinogenesis is determined by the fact that they can trigger cell division. Carcinogenic agents can cause damage to the genome of the cells, accompanied by activation of cellular oncogenes and/or inactivation of antioncogenes. It should be noted that all currently known oncoproteins, products of oncogenes, are involved in the transmission of mitogenetic signals from the cell membrane to the nucleus and to specific genes, that is, the majority of growth factors can interact with the oncoproteins.

2) genes are tumor suppressors (antioncogenes) inhibiting cell proliferation;

In the human genome there are genes that inhibit division and make antioncogenic action. Loss of effects of such genes results in the appearance of the tumor properties of tolerance to signals, prohibiting growth. One of them is gene-suppressor p53 that prevents malignant transformation of cells through temporary or permanent "arrest" and remove it from the cycle with the repair or respectively without or with apoptosis. When there is the accumulation in the cell a mutant form of p53 in excess amounts, the cell acquires the ability of enhanced proliferation, since with the damage of DNA p53 is released from MDM2 protein, which should disrupt this gene, and as this happens, it increases the period of life of a gene and activates the transcription factor.

3) genes responsible for DNA repair processes.

Genes responsible for repairing DNA damage, are a major factor in the protection of the cell's genome, as they regulate the restoration of normal DNA structure when mutated.

*Thus, cancer may become more comprehensible to us, if the clue to understanding this pathology will become the genes.*

**Key words:** carcinogenesis, oncogenes, repair, carcinoma, DNA