**PATHOGENETIC MECHANISM OF CELL DAMAGE**

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Understanding the mechanisms of development of pathological processes and diseases at a qualitatively new level - a cellular-molecular level - has made it possible to carry out molecular diagnosis and forecasting of the current for many of them. This has been particularly successful in diseases such as cancer, diabetes, heart disease, genetic defects, etc. The prescription of drugs, taking into account the way they are delivered to the affected cell, facilitates the treatment of the patient at the cellular-molecular level, which significantly increases the percentage of their healing.

The study of the general patterns of occurrence, development and outcome of pathological processes and diseases at this level is necessary for doctors of all specialties.

Changes in cell function often lead to disruption of human life. The main function of the cells is to satisfy the physiological needs of the body and to maintain its stationary homeostasis. When the cell is exposed to excessive physiological or pathological factors, an adaptation mechanism is activated, resulting in a new state, which allows them to operate normally under changed conditions. Cell damage can occur when the adaptive response reserve has been exhausted and the adaptation process has not yet arrived.Damage to the genetic program is considered a key mechanism for disrupting cell activity. The main processes that lead to changes in genetic information in a cell are mutations. Mutations occurring in the genome apparatus of a cell result in a significant change of hereditary material in nuclear structures. These mutations are characterized by changes in the shape, content and number of chromosomes in the cells of an organism. Chromosomal mutations occur when the structure of individual chromosomes changes, the size of the shoulders increases or decreases, the portion of one chromosome is translocations, and the portion of the chromosome is rotated by 180 °. The substitution of part of nucleotides in the region of a single gene leads to the formation of new qualities in the cell and body, called gene mutation. Derepression of pathogenic genes (such as oncogenes). Oncogenes are the proto-oncogenes that appear during mutation, acting in a dominant way, activate the initial stage of the cancer progression of the cell, or oncogenic viruses contained in genes that cause malignation of the cells and the formation of cancer tumors. Inhibiting the activity of vital genes. Enzyme will be the manifestation of this process. Enzyme is a disruption of the structure and function of enzymes and enzymatic catalysis. This fatally affects all aspects of cell life (for example, many of the thousands of monogenic diseases are thought to be the result of defective enzyme-coding genes).

From all of the above, we can conclude that despite the variability of pathological processes occurring in cell structures, they correspond to almost similar types of reactions. The mechanisms of alternation in cell structures are at the heart of these processes. To eliminate, limit and terminate the harmful factor, mechanisms of protection, adaptation and compensation of the processes in the cell are activated. This knowledge is applied in the timely detection of pathology and is aimed at further development of qualitative prevention of cell damage.