

THE COMPUTER MODELLING OF CANCER GROWTH IN ADDITION OF ENDOGENOUS AND EXOGENOUS FACTORS USING CELLULAR AUTOMATA CONCEPTION

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Cancer - the malignant tumor is formed from epithelial cells of a leather, mucous membranes and parenchyma bodies. In most cases in the tissue adjoining with an environment and covered multilayered flat epithelia flat cells cancer arises. It can also appear in bronchial tubes. Cancer is one of the most widespread reasons of death.

The main problem of this work is to describe and make prognosis for such tumors to make the treatment more effective.

In this paper results of the computer modeling of cancer growth in addition of endogenous and exogenous factors using cellular automata conception are reviewed.

The basic advantages of this approach is that

- The model describes geometrical distribution of a tumor;
- The model includes algorithmic description of tumor cells reaction and allows considering process of influence on tumor growth of various external factors and process of chemotherapy;
- At last the model allows visualizing tumor growth process.

Cellular automata feature is that they possess characteristics of imitating and dynamic model. It allows approaching behavior of automata to behavior of real biological objects, but thus complicates analysis of the final results.

On the basis of the cellular automata conception authors have made the two-dimensional model of normal and pathological epithelial tissue growth. The results of the modeling are qualitatively in a good agreement with verbal biomedical descriptions of tumor growth. Such model should allow one to develop and test hypotheses which can lead to a better understanding of this destructive biological process.

Modeling cancer growth and tumor reaction on different influence can help one to make more effective complicated individual treatment plan for the patient that accounts for the disease and the patients' health.