

STEM CANCER CELLS AS A SOURCE OF MALIGNANT NEOPLASMS

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In this paper, modern data on stem cancer cells are analyzed.

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In 2018, 9,6 million people died from tumors, this is almost every 6 people in the world. So the treatment and determination of the causes of tumor formation is the reason for oncologists to save lives. RSC is supposed to be the source of tumor formation.

As a result of my research I received the following important information about cancer stem cells:

1. CSC in the entire tumor mass is 0,001-1%. But if they were formed from stem cells, then they and only they can divide an unlimited number of times.

2. The tumor mass is represented by a hierarchical structure, at the top of which is cancer stem cells → temporarily proliferating cancer cells → terminally differentiated cancer cells. The last two types of cells form the bulk of the tumor.

3. A specific set of surface markers is expressed on the surface of RSCs, which allow differentiating them from the total cell mass.

4. Increased expression of anti-apoptotic molecules.

5. Selective expression of some members of the multidrug resistance Transporter family. (Aldehyde dehydrogenase).

6. Activation of stem cell-specific survival signals.

7. Specific microenvironment, which provides the development of tumors.

8. Metabolic rearrangements (increased use of oxidative phosphorylation and glycolysis).

9. Vascularization (provision of blood vessels and blood).

10. Invasiveness - the ability to lyse the basal membrane, this increases the ability to migrate, metastasis and adaptation to the tissue environment.

11. The immune system does not recognize RSC.

12. Excessive resistance to all known treatments (radiotherapy, chemotherapy, immunotherapy, targeted therapy).

13. The ability of the RSC to fall into a state of dormancy, that is, into a state of hibernation.

Thus, in this paper, a comprehensive analysis of modern literature data on the structure and functions of cancer stem cells is done.

All developments made in this area, change all ideas about ontogenesis that have developed over the years. As a result, a new "image" of carcinogenesis as a biological phenomenon is formed, originating from the nature of stem cells present in the body at all stages of human life. Therapy against cancer stem cells is a new, innovative promising strategy in Oncology, as it allows you to move away from the old, established ideas about the nature and pathogenesis of carcinogenesis with generally accepted standards of treatment, which still do not allow to cross the threshold of five-year survival of at least 50 % of patients.