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The problem of studying the genetic mechanisms of stress tolerance is relevant nowadays. As a matter of fact one group of people has an adequate reaction to stress under the influence of stress factors and the other group develops anxiety and depression, which can lead to serious changes in the psyche. The study of this problem will help to draw a conclusion about the contribution of stress tolerance genes to the psychoemotional state of a person.

**Keywords:** stress, genotyping, marker.

The dopamine 2 receptor gene DRD2 is the most significant of the dopamine receptors. This is a protein localized on the surface of neurons, conjugated with G-proteins, participating in the activation of various processes inside the cell under the influence of dopamine. DRD2 receptors are involved in controlling aggressive behavior and anxiety.

The aim of this work was to study the frequency of 939 C/T DRD2 polymorphism in the population group of the Belarusians.

One of the most studied polymorphisms of the DRD2 gene is Taq1A (C939T) polymorphism. Carriers of the A1 or T allele show a 30–40% decrease in the density of these receptors in the striatum compared to those with the genotype A2 or C. A decrease in the density of receptors leads to a decrease in attention and learning ability, and an increase in anxiety [1]. Carriage of the A1 (T) allele is also associated with «lack of reward syndrome» and «novelty search» in which dopamine levels decrease, forcing a person to look for factors that increase its level (for good health), which determines a tendency to addictive behavior [2]. Carriers of the C/C genotype (A2/A2) are characterized by increased social activity, higher motivation for cognition, self-development and self-realization, and have increased stress resistance [3].

We carried out genotyping of the control population group of people according to the polymorphic variant 939 C> T among the Belarusian population. The number of study participants was 233 people. The results of genotyping are presented in Table 1.

Table 1

Frequency of occurrence of allelic variants of polymorphism 939C/T of DRD2 gene  
in representatives of Belarusian population

| Allelic variants | Number of persons | Frequency of occurrence, % |
|------------------|-------------------|----------------------------|
| C/C              | 144               | 60,90                      |
| C/T              | 74                | 33,00                      |
| T/T              | 15                | 6,00                       |
| C                | 180               | 77,50                      |
| T                | 53                | 22,50                      |

According to the table 1 we can see that the genotype CC occur more frequently than TT. We found the polymorphism of 939 C>T of the DRD2 gene playing informative role for determining of human stress resistance.

The frequency of occurrence of the T allele in the European population is 18%, which is comparable with the results characteristic of the Belarusian population (22,5%). The results indicate a lower predisposition to stress in people with the CC genotype and greater emotional instability of carriers of the TT genotype.

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## STEM CANCER CELLS AS A SOURCE OF MALIGNANT NEOPLASMS

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

**Keywords:** cancer Stem cell, tumors, oncogenesis.

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.