

Depression is one of the most serious challenges that the world of medicine must face in the 21st century. It is impossible to deny that humanity has been made measurable successes over the past few decades. The available antidepressants have given many people suffering from depression real help, unfortunately, this undoubted success of medicine of the last century has its limitations. Among depressed patients there are still people for whom available antidepressant pharmacotherapy has not proved effective and their life is inseparably connected with struggling with severe symptoms of the disease. Thus, drug-resistant depression is a medical problem that still demands an effective solution.

One of the conditions for developing better treatments for depression is a deeper understanding of its biological substrate. Currently, there are a number of social, genetic or nutritional factors that significantly change the functioning of the human body, deciding about the individual risk of developing depression and the potential effectiveness of its treatment. For many years, the literature on the subject indicates that chronic stress may be the most important social factor responsible for triggering deep changes in the biological structure of the human body, which ultimately lead to full-blown depression. At the same time, the results of some clinical studies indicate a relationship between this disease, drug resistance and insufficient supply of zinc in the body.

Given the above-mentioned premises and the results of our own preliminary research, the purpose of the submitted project is to understand the biological basis and nature of drug resistance occurring in mice receiving a diet low in zinc and at the same time subjected to the procedure of chronic stress. In the next stage of work, an attempt will be made to overcome the observed drug resistance with the help of diverse and experimental therapy.

The project is an interdisciplinary undertaking in which numerous experiments with different methodologies will be carried out, which will allow exploring interesting aspects of the issue at many levels of explanation, i.e. behavioral, molecular, genetic, and cellular. The main scientific achievement of the project will be an insight into the biological essence of drug resistance caused by chronic stress and disturbed supply of zinc in the diet, and the development of a new animal model of drug resistant depression.