

The stimulating effect of L-arginine on energy metabolism in the brain under conditions of depression

Giorgi Ananiashvili

e-mail: giorgi.ananiashvili342@ens.tsu.edu.ge

Department of Biology, Faculty of exact and natural sciences, Tbilisi State University,
Ilia Chavchavadze Avenue 3, Tbilisi, 0179, Georgia

Depression is a widely prevalent psychiatric disorder that significantly impacts human health and productivity. In some cases, it can even lead to suicide. The number of individuals affected by depression increases annually, which is clearly reflected in the economic status of various countries. All of this underscores the necessity and relevance of researching depression and its treatment methods.

The primary approach to treating depression involves the use of antidepressants. These medications increase the concentration of serotonin, dopamine, and nor-epinephrine in synapses, thereby alleviating depressive symptoms. However, their drawbacks are noteworthy, including severe side effects, delayed onset of results, the need for prolonged use, and resistance to antidepressants in some patients. These negative aspects of antidepressants necessitate the search for less aggressive and more convenient treatment options.

Recent evidence suggests that one of the main causes of depression is the disruption of energy metabolism in brain cells. As a result, active efforts are underway to identify therapeutic agents that enhance energy metabolism and, through this mechanism, reduce or completely eliminate depressive symptoms.

The aim of our study was to investigate the effect of the amino acid L-arginine on energy metabolism in the brain cells of depressed animals. Arginine, as a precursor of nitric oxide (NO) and creatine, has the potential to positively influence energy metabolism. This potential formed the basis of our selection of arginine as a stimulator of energy metabolism to improve depressive states.

The results of our study demonstrate that the administration of the amino acid L-arginine significantly improves energy metabolism in the brains of depressed animals, which, in turn, has a positive effect on depressive state.