

Possible new method for treating autism and memory disorders

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Credit: TSU

Scientists at the Tomsk State University exploring myokines, proteins that are produced in the muscles during physical activities, have found that these active agents enhance human cognitive function. Scientists

hope to use this feature to treat conditions such as autism, hyperactivity and memory disorders.

"The fact that physical activity helps to maintain good memory and mental longevity has been known for a long time," says Anastasia Kabachkova, an employee of the TSU. "We are interested in the mechanism, in other words, the kind of myokines that are produced as a result of certain exercises. Knowing how this happens, we will be able to choose a set of exercises that will replace medication and treat cognitive disorders without pills."

In order to determine the conditions of the production of myokines, [scientists](#) at the Faculty of Physical Education conducted comprehensive studies involving volunteers. Volunteers were divided into three groups characterized by different movement modes—sedentary lifestyle, normal, and excessive [physical activity](#) (athletes).

During the tests, they carried out complexes of exercise, and in some cases, combined physical and mental exercises. For example, they held down a barbell while looking at the monitor and mentally producing mathematical calculations. Scientists evaluated a number of parameters, including the indicators of brain activity and blood flow in the brain.



Credit: Tomsk State University

In addition to people, animals were also involved in the experiments. Laboratory mice were subjected to running, swimming and weight training. After that, scientists took biological samples and examined the content of myokines in the animals' skeletal muscles.

"The next step will be experimenting with cell cultures," Kabachkova. "We grew muscle tissues of rats and humans in the laboratory. Then, using an electric current, we simulated the contractions that occur in the muscles during exercise and investigated the myokines that were formed."

At the end of the experiments, the researchers will summarize the data and develop a complex of exercises that produces the necessary myokines for brain function. These complexes could be used to treat autism and hyperactivity, stroke symptoms, and impaired memory and attention disorder.

TSU scientists have been studying myokines for several years. In the course of joint research conducted with colleagues from the University of Montreal, they found that the muscles operate not only for motor function, but also as endocrine organs. The scientists want to use this property for the treatment of diseases associated with metabolic disorders—diabetes, obesity, and other ailments.

More information: [10.3389/fphys.2017.00035](https://doi.org/10.3389/fphys.2017.00035)

Provided by Tomsk State University

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