

Testing device for performance-enhancing drugs provides immediate results

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The pilot device for rapid meldonium testing developed at TPU. Credit: Tomsk Polytechnic University

Scientists from Tomsk Polytechnic University (TPU) have developed a prototype analyzer for rapid testing of meldonium and other performance-enhancing drugs in competitive athletics. The device is

based on an electrochemical method that allows displaying test results immediately.

In contrast to similar devices on the market, the analyzer is mobile, has a user-friendly interface, and is far cheaper. It is expected to cost up to USD \$1500.

"The most popular method to test for meldonium in the blood is gas chromatography with [mass spectrometric detection](#)," says Olga Mezentseva, post-graduate student at the TPU Institute of Natural Resources. "This method involves using rare and expensive reagents, and the sample preparation process is also expensive. Our reagents are affordable, and therefore inexpensive. The electrodes used in the device are standard and fit most voltohmmeter devices."

The analyzer is easy to use, thanks to an intuitive interface, and most importantly, it is compact and does not require additional software. Similar devices require post-processing of results with a computer on which special software is installed. The PTU device display provides test results immediately.

"Initially, our research team developed a technique for rapid meldonium testing in the athlete's body, but now we have set ourselves a broader task—to develop devices to test athletes for different types of drugs," says Olga Mezentseva.

She notes that the basis of such a device is an electrochemical technique that detects a substance with electric current exposure. This technology has long been used by TPU scientists for identifying many organic substances. To fine-tune the device to test for different banned drugs, a laboratory staff member can change electrodes in the device.

"Firstly, a prototype of our device was presented at the U-NOVUS

forum for young scientists. Now, we are carrying out metrological evaluation of the technique with colleagues. We plan to develop the chosen direction, and improve the device. By the end of 2016, we intend to create the first prototypes of universal electrochemical analyzers," says Olga Mezentseva.

Provided by Tomsk Polytechnic University

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