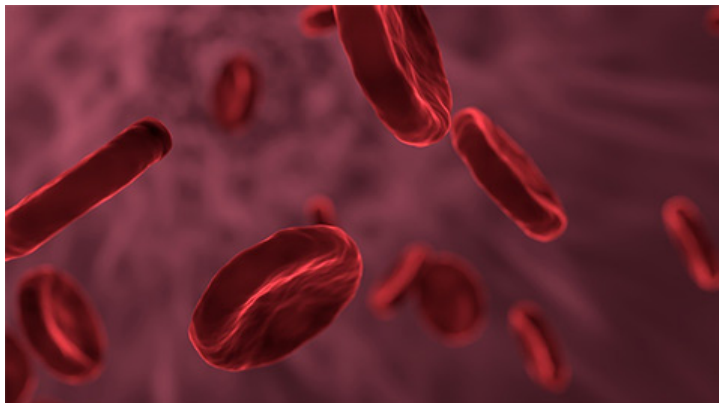


Siberian scientists develop an alternative to foreign-made diagnosis system for diabetes

Scientists from Siberian Federal University, Biophysics Institute of the Siberian Branch of the RAS and the Institute of Chemical Biology and Fundamental Medicine are developing a system for diagnosing diabetes mellitus by the content of hemoglobin in the blood combined with glucose. The development can replace foreign-made systems. The paper about the research is published in the journal *Analytical Biochemistry*.



Two methods for diagnosing diabetes are currently used in Russia: the content of free glucose in the blood and the content of hemoglobin combined with glucose, the so-called glycated hemoglobin. The first method is most famous and widespread, but the second one is more objective and informative: it allows to assess the patient's condition for a period of 3–4 months.

There are no Russian developments to identify and monitor this indicator yet. Russian medical laboratories use foreign-made systems, which are closed complexes. Reagents and consumables for them are purchased from the manufacturer annually in accordance with the expiration dates. The development of the Russian-made system will make the diagnosis of diabetes more accessible and reliable. The formation of glycated hemoglobin indicates the presence of excessive sugar in the bloodstream. It is also a key indicator in pregnant women with gestational diabetes. The analysis developed by Siberian scientists is based on the use of aptamers — special short fragments of ribonucleic acids.

Aptamers “recognize” free hemoglobin or its glycated form and selectively bind to it. To detect these emerging complexes, it is proposed to use special light-emitting proteins — luciferase. Their signal allows conducting analysis with high sensitivity.

“We are at the very beginning of the development: the first model experiments were made, which showed the fundamental possibility of using the proposed analysis based on the aptamer as a specific element and light-emitting protein as a sensitive reporter,” — said **Lyudmila Frank**, head of the Krasnoyarsk group, Professor at the Specialized Department of Biotechnology of Siberian Federal University.



The scientists say that the study will continue, with plans to increase the sensitivity of the analysis, to test the method on the study of clinical samples and to develop a format convenient for clinical use.

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