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Press release
For immediate release

Early detection of diabetes: Graz research shows the potential of a new biomarker
New lab test could reveal previously undetected glucose metabolism disorders

Graz, 4 August 2026: Disorders of glucose metabolism frequently remain undiscovered at an early stage despite routine testing. Researchers at the Medical University of Graz who are part of the MetAGE consortium have now shown that the metabolic marker 2-hydroxybutyrate (2-HB) might help close this diagnostic gap. A newly developed lab test enables better assessment of the risk for previously undetected disorders of glucose metabolism, also in individuals with unremarkable blood values. The findings were recently published in the renowned Diabetes Care journal.

Earlier detection, more targeted action

In up to 40 percent of cases, current screening methods do not detect individuals with a disorder in glucose metabolism because abnormalities are often not apparent until after the patient has consumed a measured amount of sugar as part of an oral glucose tolerance test (OGTT). Med Uni Graz researchers have investigated whether the metabolic marker 2-hydroxybutyrate (2-HB) can complement early detection. The study was based on data from 772 participants in the Graz long-range study BioPersMed.

"The concentration of 2-hydroxybutyrate increased as glucose metabolism became more impaired. The biomarker indicated differences between people with normal glucose metabolism, prediabetes and type 2 diabetes. It was particularly interesting that it was also significant in people whose fasting blood sugar and long-term blood sugar value (HbA1c) still fell within the normal range. Our findings show the potential of 2-hydroxybutyrate as a supplement to established testing methods. In the future, the marker might help better identify people with previously undiscovered disorders of glucose metabolism while sparing people with a very low risk from unnecessary testing," explains first author Christoph Strohhofer of Med Uni Graz.

Less stress, more targeted diagnostics

The findings were especially relevant for the 534 participants whose blood values were still unremarkable. In this group, 2-hydroxybutyrate was able to identify previously undetected disorders in glucose metabolism with high accuracy. At a defined cutoff value, the test detected 90 percent of individuals affected. At the same time, an unremarkable result was able to rule out relevant metabolic disorders.

Pioneering Minds - Research and Education for Patients' Health and Well-Being

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In the future, the biomarker might help facilitate more targeted use of further testing. Many elaborate glucose tolerance tests might be able to be avoided without overlooking important metabolic disorders.

From research to routine diagnostics

One important advance thanks to the study is a newly developed lab test which will make it easier to measure 2-hydroxybutyrate. Previously, the biomarker could only be determined with special elaborate procedures. In contrast, the new test is compatible with established clinical lab equipment, thus providing an important foundation for possible routine medical use.

"What is critical is not just the biomarker itself but that we can now measure it with a procedure that is fundamentally suitable for clinical practice. This opens up the perspective for integrating new strategies for early detection more easily into routine healthcare," says last author Thomas Pieber, head of the Med Uni Graz Division of Endocrinology and Diabetology and MetAGE Head Clinical Trials Program.

MetAGE combines research and application

The study arose as part of the MetAGE Cluster of Excellence. In the course of the project, a research collaboration was started with the Viennese company DirectSense, which developed the enzyme test used in the study to measure 2-hydroxybutyrate. For this test, DirectSense provided the assay for the analysis of samples from the BioPersMed cohort. The scientific planning of the study as well as the evaluation and interpretation of the findings was independently carried out by the Med Uni Graz research team.

"The MetAGE collaboration has enabled us to investigate the newly developed test in a large clinical cohort. It was critical to evaluate the measurement method under real conditions with existing study data. The combination of technological development and clinical research is an important step toward examining new approaches for medical application," emphasizes Strohhöfer.

To the publication

Enzymatic 2-Hydroxybutyrate Measurement for Dysglycemia Screening Beyond Conventional Fasting Measures. Diabetes Care (2026), DOI: 10.2337/dc26-0567

<https://diabetesjournals.org/care/article/49/8/1374/170107/Enzymatic-2-Hydroxybutyrate-Measurement-for>

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MetAGE Cluster of Excellence

Funded by the Austrian Scientific Fund (FWF), the MetAGE Cluster of Excellence investigates how metabolic processes influence aging processes and age-related diseases. The aim of the cluster is to develop new biomarkers and therapeutic approaches to diseases such as diabetes,

cardiovascular diseases and neurodegenerative diseases. By fostering collaboration between basic research, clinical research and industrial partners, scientific findings can be translated more rapidly into medical application.

<https://www.metage.at/de>

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