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IIT Guwahati develops device for instant glycemic index detection of fast food

The portable device provides real-time data for people with diabetes or those managing their blood sugar through diet

By **Shraddha Warde** | October 20, 2023



Prof Dipankar Bandyopdhyay and Prathu Raja Parmar(Lto R)

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Researchers from the Indian Institute of Technology Guwahati (IIT Guwahati) led by Prof. Dipankar Bandyopadhyay, Department of Chemical Engineering, have developed a reliable and affordable Glycemic Index (GI) sensor, suitable for point-of-care detection. This sensor can determine the GI of different food sources in real-time which is crucial for diabetes management.

The Glycemic Index or GI is a measure that ranks carbohydrate-containing foods based on how they affect blood sugar levels when consumed. High-GI food can cause a rapid spike in blood glucose levels, followed by a swift decline. Moreover, these high-GI foods stimulate an increased demand for insulin, contributing to the risk of developing type-2 diabetes. Importantly, low-GI food helps to prevent diabetes, heart disease, obesity, and cancer.

As the trend of fast food increases among the world's working population, the need for a portable device that can immediately detect and guide the user about the GI of the food arises. The point-of-care-testing (POCT) prototype developed by the IIT Guwahati team can detect the glycemic Index of common food sources in approximately 5 minutes.

Explaining the detection methods Prof. Bandyopadhyay said, “We developed a composite nanoenzyme by combining gold nanoparticles with alpha-amylase to break down long-chain starch molecules into simpler sugars. We found that this nanoenzyme of approx. 30-nanometer size has remarkable heterogeneous catalytic properties to rapidly degrade starch into maltose at room temperature.

The amount of maltose produced is then electrochemically detected to classify the food sources into Rapidly Digestible Starch (RDS) and Slowly Digestible Starch (SDS) along with Resistant Starch (RS).

Explaining the real-time monitoring of fast food, Prof. Bandyopadhyay said, “When we tested the device on fast foods like crackers, biscuits, chips, and bread, we found that crackers have the most RDS, followed by potato chips, and then brown bread. Notably, the SDS/RS of brown bread releases maltose slowly, causing a gradual increase in glucose levels and a lower

response from insulin in the body.”

Read online: https://nuffoodsspectrum.in/news/17/20379/iit-guwahati-develops-device-for-instant-glycemic-index-detection-of-fast-food.html

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