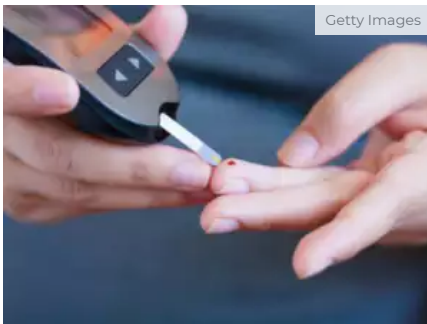


No more painful needles: BITS scientists develop Rs 400 device that can detect diabetes through sweat

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Synopsis

BITS Scientists have developed a portable system that uses 3D printing technology to analyze glucose and lactate levels in sweat samples. The device, which can be connected to smartphones, eliminates the need for blood samples to assess glucose levels and can detect lactate concentration using sweat samples. The researchers are currently working on a wearable version of the device.



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In a big breakthrough, researchers from the Birla Institute of Technology & Science (BITS), Pilani, Hyderabad, have introduced a groundbreaking technology to detect and management of diabetes. As per a TOI report, a team of scientists has introduced a portable system designed to analyze glucose and lactate levels found in sweat samples, using the power of 3D printing technology.

Published in Elsevier and backed by the Telangana State Council of Science & Technology (TSCOST), the study highlights the potential of sweat as a primary analyte, especially for continuous monitoring of sugar levels in individuals dealing with type 1 and type 2 diabetes.

The scientists aim to make it commercially available within the next six to nine months at a cost of between Rs 300 and Rs 400 per unit.

Professor Sanket Goel told TOI that the device is the result of combining 3D printing, CO2 laser, and graphene-based electrodes. Notably, the researchers themselves extracted the graphene. "This system's non-invasive nature removes the need for blood samples to assess glucose levels. While it can also function with blood samples, the real innovation lies in its ability to detect lactate concentration using sweat samples," noted Sanket Goel.

The mechanism for lactate concentration detection involves a novel process. Professor Goel clarified, "This operates

based on Electrochemiluminescence (ECL). The device triggers an electrical signal upon receiving sweat as input, initiating a chemical reaction that generates light as output. By gauging the intensity of this light, we can accurately determine lactate concentration."

Leveraging machine learning, the researchers ensured precision in measuring lactate concentrations, which is critical for effective treatment.

The team has successfully developed a portable device that can connect to smartphones, allowing users to access human metabolite data through a dedicated app. Their ongoing work is centered on crafting a wearable version of the device to enable continuous monitoring. Collaborating with a company, they aim to make the device commercially available within the next six to nine months. The projected cost per unit in bulk production is anticipated to range between Rs 300 and Rs 400, making it an accessible tool for diabetes management.

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