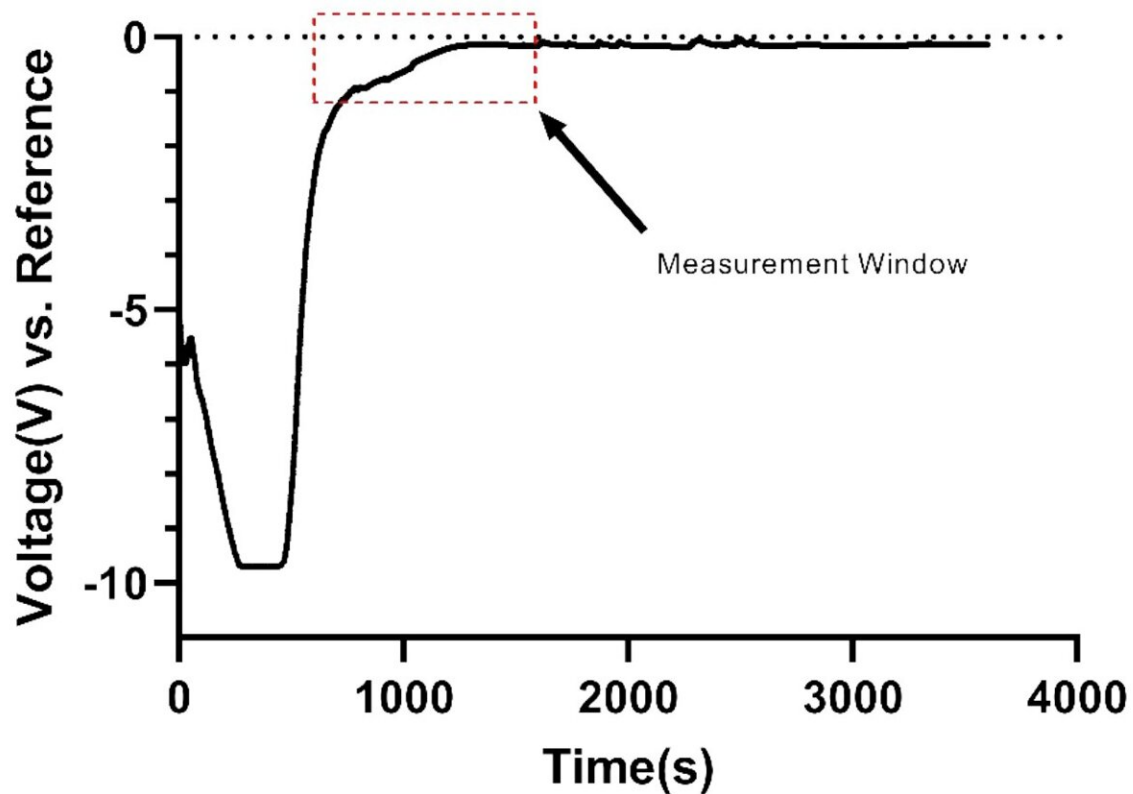


New sensor technology measures THC levels in saliva

September 21 2023, by Kim Horner



Open Circuit Potential of the sensing platform in PBS. Credit: *The Analyst* (2023). DOI: 10.1039/D3AN00522D

University of Texas at Dallas researchers have developed a hand-held rapid saliva test that can measure the level of THC, the major active

component in marijuana, with 94% accuracy.

The device, called CannibiSenS, also can distinguish between THC and CBD, a component of the cannabis plant that does not cause a psychoactive effect and is sold legally in dietary substances, creams and other products in most states.

The sensor could be used as a tool for law enforcement officers to test drivers believed to be impaired. Additionally, medical [marijuana](#) practitioners, patients and recreational users might find it helpful to monitor THC levels, said Dr. Shalini Prasad, professor and department head of bioengineering and a Cecil H. and Ida Green Professor in Systems Biology Science in the Erik Jonsson School of Engineering and Computer Science.

Prasad and her colleagues published a study on the technology in the journal [Analyst](#).

"The CannibiSenS device has demonstrated the potential for serving the cannabis community in a manner akin to how [glucose monitors](#) help the diabetic community," said Prasad, who has developed similar technology to monitor [glucose levels](#) in sweat. "Ultimately the goal is to provide actionable data with a simple mess-free method."

Using the device involves taking a [saliva sample](#) from inside the cheek with a swab. The sample can be placed onto the sensor by gently dabbing the swab onto the sensor surface or by using a dropper if the sample was collected earlier. The electrochemical sensor is more sensitive than over-the-counter tests, which typically detect THC but do not determine its concentration.

Measuring THC concentration is important, Prasad said, because detectable amounts of the compound can remain in a marijuana user's

bloodstream for days after use, creating the potential for false positives in a roadside test, for instance. She said the sensor's ability to distinguish between THC and CBD also reduces the chance of false positives.

To test the device's capability in a real field-test scenario, researchers collected saliva samples from five people, then spiked the samples with THC before testing the samples with the device. It was accurate 94% of the time.

Marijuana is the most used federally illegal drug in the U.S., according to the Centers for Disease Control and Prevention. Marijuana affects parts of the brain responsible for memory, learning, attention, decision-making, coordination, emotion and reaction time. There is no universal threshold for the amount of THC that causes impairment, and it can be difficult for users to monitor because the potency of marijuana can vary. Many states that have legalized marijuana, however, have set the threshold at 5 nanograms per milliliter.

For medical marijuana practitioners and patients, the sensor could help determine the most effective dose.

"Our saliva test will tell you what the THC level is, which in medical cases can help determine an optimal dosing level," Prasad said. "Patients could use the test to manage their doses and make adjustments when needed."

The UT Dallas researchers' study follows a 2019 [proof of concept study](#) that generated interest in the device. Prasad, who directs the Biomedical Microdevices and Nanotechnology Laboratory, and her team of researchers have developed sensor technologies that can detect molecules associated with various conditions, including diabetes, inflammatory bowel disease and sepsis.

Most recently, they demonstrated technology that can detect two key biomarkers of infection in human sweat, a significant step toward making it possible for users to receive early warnings of infections such as COVID-19 and influenza.

More information: Nathan Kodjo Mintah Churcher et al, CannibiSenS: an on-demand rapid screen for THC in human saliva, *The Analyst* (2023). [DOI: 10.1039/D3AN00522D](https://doi.org/10.1039/D3AN00522D)

Provided by University of Texas at Dallas

Citation: New sensor technology measures THC levels in saliva (2023, September 21) retrieved 28 April 2024 from <https://medicalxpress.com/news/2023-09-sensor-technology-thc-saliva.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--