Bio Markers

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In news : Dr. Vinu Mohan A.M., scientist at CSIR-CECRI has introduced a flexible low cost, wearable sensor that can track sweat for monitoring biomarkers, the health and physiological status of the human body

Key updates

- The sensor can obviate the necessity of blood and other invasive tests.
- Dr. Vinu Mohan A.M., scientist at **CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi, Tamil Nadu**, a recipient of the **INSPIRE Faculty Fellowship** instituted by the Department of Science & Technology
- The wearable microfluidic sensor, which does not need a clean room, can be used for in situ monitoring of biomarkers such as lactate, Sodium (Na+), Potassium (K+), and Alkaline/acidic nature (pH) simultaneously from sweat samples.
- The sensor can analyse biomarkers from human sweat during exercise activities without transfer of signals.
- The high-throughput sweat sampling ability of the sensor facilitates continuous capture and transport of sweat over the surface of the device resulting in real-time analysis.
- The flexible sensor can be attached on the irregular skin surface and monitors the dynamic biomarker levels, and are important for clinical diagnosis and personalized point-of-care analysis.
- Developing microfluidic sensors with rapid sweat sampling and multiplexed electrochemical recognition abilities are extremely important for accurate sweat biomarker analyses and continuous real-time monitoring of health.

- This research has been published in the journal '*ACS Sensor*

How does it work?

- In the sensor set up by Dr. Vinu's research group, a fluidic channel, captures real-time sweat and directs it through the active sensing electrodes for subsequent interference-free analyses.
- A miniaturized printed circuit board collects cross-talk-free sensor responses without the need for wires.
- The fully-integrated pump-less microfluidic device is mounted on the skin, and the regional variations in sweat composition are analyzed at the underarm and upper back locations during stationary biking.
- The epidermal patch can monitor the hydration level and oxygenation of muscles which is essential for fitness monitoring application.

What are biomarkers?

A biomarker, or biological marker is a measurable indicator of some biological state or condition

More generally a biomarker is anything that can be used as an indicator of a particular disease state or some other physiological state of an organism

A biomarker can be a substance that is introduced into an organism as a means to examine organ function or other aspects of health

They are the measures used to perform a clinical assessment such as blood pressure or cholesterol level and are used to monitor and predict health states in individuals or across populations so that appropriate therapeutic intervention can be planned.

Examples of biomarkers include everything from blood pressure

and heart rate to basic metabolic studies and x-ray findings to complex histologic and genetic tests of blood and other tissues.