FRANÇAIS ENGLISH

cea leti

SweatPatch

Technologie brevetée

Real-time sweat analysis in a wearable health and wellness device

What it is

SweatPatch is a wearable device prototype that non-invasively collects sweat from the skin via an innovative adhesive surface with an integrated microfluidic circuit. Electrochemical sensors inside the unit then analyze the sweat collected in real time to monitor for parameters like hydration.
The sweat collected is then evacuated by evaporation through a microporous surface. All of the layers are fabricated on flexible substrates thin enough to curve for a comfortable fit on the arm.

The current prototype has six sensors, which could each be functionalized to monitor for a different substance, opening the door to multi-parameter analysis within a single device.

What it can do

This type of non-invasive, wearable monitoring device could make sweat a biological fluid of interest for human and animal health and wellness:

- Monitoring hydration in the elderly and in athletes.
- Monitoring of the onset of sweating.
- Monitoring of metabolites, drugs, trace metals, proteins, cytokines, cortisol, and other biomarkers of stress and disease.

What makes it unique

CEA-Leti's wearable prototype sweat analysis device combines a microfluidic circuit, functionalized electrochemical sensors, and an innovative skin interface.

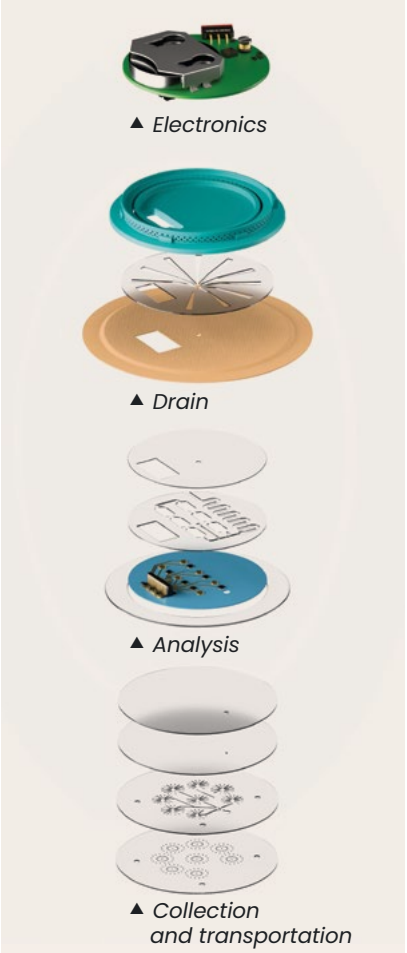
- Monitoring is robust (all sweat collected is analyzed)
- Multiple sensors can be functionalized separately enabling multiparameter analysis
- Adheres directly to the skin

Working with CEA-Leti

SweatPatch was developed using CEA-Leti's "compliant by design" approach to health and medical technologies. All regulations, standards, and protocols are integrated into the design and development process, and all materials are medical-grade, non-toxic, and biocompatible.

CEA-Leti's historic know-how in sensors, PCB design, sensor functionalization, and device characterization, plus experience scaling up technologies in its own cleanrooms, support the efficient transfer of new devices to commercial fabs.

Health and wellness device manufacturers interested in adding sweat analysis to their solutions are encouraged to contact CEA-Leti to learn more about R&D partnerships.



▲ *Electronics*

▲ *Drain*

▲ *Analysis*

▲ *Collection and transportation*

The **sweat sensor's** electronics incorporate **STMicroelectronics** products, specifically their microcontroller, power management IC, and NFC. **STMicroelectronics** developed the **EC-10** for electrochemical cell reading. This ultracompact sensor effectively drives and reads solid-state electrochemical cells, performing with **high accuracy** even at **very low current** levels. It supports both **open-circuit potential (OCP)** and **chronoamperometry**. This device is crucial for applications including sweat sensing, continuous glucose monitoring, and wound monitoring.

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Interested in this technology?

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