

In-Situ Sweat Rate Monitoring For Normalization Of Sweat Analyte Concentrations

Tech ID: 30574 / UC Case 2018-218-0

SUMMARY

UCLA researchers in the Department of Electrical Engineering have developed a method of in-situ sweat rate monitoring, which can be integrated into wearable consumer electronics for physiological analyses.

BACKGROUND

Despite being a rich source of biomarkers, sweat analysis is not widely used in physiological and clinical settings due to the lack of suitable technologies extracting physiologically meaningful information from the sweat readings. Previous studies have demonstrated some level of correlation between the blood and sweat content in the context of informative biomarkers. However, the correlations varied for each analyte, differed from subject to subject, and were inconsistent during the entire period of the experiment. These discrepancies are primarily attributed to variations in the sweat gland secretory rate, which is the major operational factor in the sweat secretion process.

INNOVATION

Researchers at UCLA have developed a novel method to monitor sweat rate in-situ to achieve a normalized measure of the target biomarkers. The sweat rate information allows for characterizing and decoupling the confounding effect of the influential secretion parameters in the transport of the target biomarkers into sweat. The sweat rate information is also useful measure of hydration status and temperature and oxygen regulation. Normalization methodology used in this method helps mitigating the dependency of the sweat readings on secretion parameters. This sweat rate monitoring method can be incorporated into wearable device, or it can be integrated into existing consumer electronic devices to provide valuable physiological insight.

APPLICATIONS

- ▶ Sweat analysis of biomarkers normalized against sweat secretion rate

ADVANTAGES

- ▶ Improve the sweat sensor readings by mitigating the effect of variable sweat secretion parameters

STATE OF DEVELOPMENT

A device prototype is available.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20210076991	03/18/2021	2018-218

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Wearable Voltammetric Monitoring of Electroactive Drugs](#)
- ▶ [Mediator-Free Electroenzymatic Sensing with Enhanced Sensitivity and Selectivity for Wearable Metabolite and Nutrient Monitoring Applications](#)
- ▶ [A Wearable Freestanding Electrochemical Sensing System](#)
- ▶ [Multiplexed Sweat Extraction And Sensing Wearable Interface For Normalized And Periodic Analysis](#)
- ▶ [A 3D Microfluidic Actuation and Sensing Wearable Technology for In-Situ Biofluid Processing and Analysis](#)
- ▶ [A Wearable Platform for In-Situ Analysis of Hormones](#)
- ▶ [Ultra-Low Cost, Transferrable and Thermally Stable Sensor Array Patterned on Conductive Substrate for Biofluid Analysis](#)

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OTHER INFORMATION

KEYWORDS

sweat analysis, sweat sensor, sweat rate, biomarker, wearable, consumer electronic device, sensor, medical device

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Engineering**
 - ▶ Engineering
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 - ▶ Devices
- ▶ **Sensors & Instrumentation**
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