Abstract

Wearable Sensor for Real-Time Monitoring of Electrolytes in Sweat †

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The measurement of sweat electrolytes has a number of important applications including monitoring the performance of athletes [1] and providing information on medical conditions such as cystic fibrosis [2]. Herein we present on a wearable non-invasive electrochemical-sensing platform for the detection of different electrolytes in sweat. The platform accesses sweat emerging through the skin during exercise, which is drawn across the sensors by capillary action to a highly adsorbent material reservoir. The sweat electrolyte composition is accessed via integrated solid-state ion-selective electrodes that can track their concentration in real time. The sensor data is digitised, stored locally, and subsequently transmitted via Bluetooth to a laptop. The platform design and fluidics have been optimised through several iterations using rapid prototyping technologies such as 3D printing. Results obtained during on body trials over a period of exercise are consistent with previously published data [3] on the use of wearable sensors for the real time monitoring of electrolytes levels in sweat.

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References


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