

Wireless electronics system for healthcare applications

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Viral outbreaks like COVID-19 highlight the growing role of non-contact, remote health monitoring via wireless medical devices. Remote health monitoring solutions collect medical health data and vitals, such as blood pressure, heartbeat, respiration rate, hydration levels and various biomarkers of different diseases from the user's devices. Often in the form of medical wearables and apps (Fig.1), users transform their smartphone into a mobile lab for advanced diagnostics and real-time disease surveillance. The medical ecosystem can play in fighting the spread of novel infectious diseases. Accurate and comfortable digitization of human signals requires overcoming the mechanical mismatch between soft human bodies and rigid electronics and reconstructing them into biocompatible forms. This paper introduces soft, small medical devices that simply adhere to the human body and provide wireless measurements of hydration levels in skin [1] and sweat-related dynamics [2] as biomarkers of different diseases. Increased support for wireless healthcare application outlines a current trend that will facilitate a remote health and wellness monitoring to bridge spatial-temporal gaps in healthcare system.

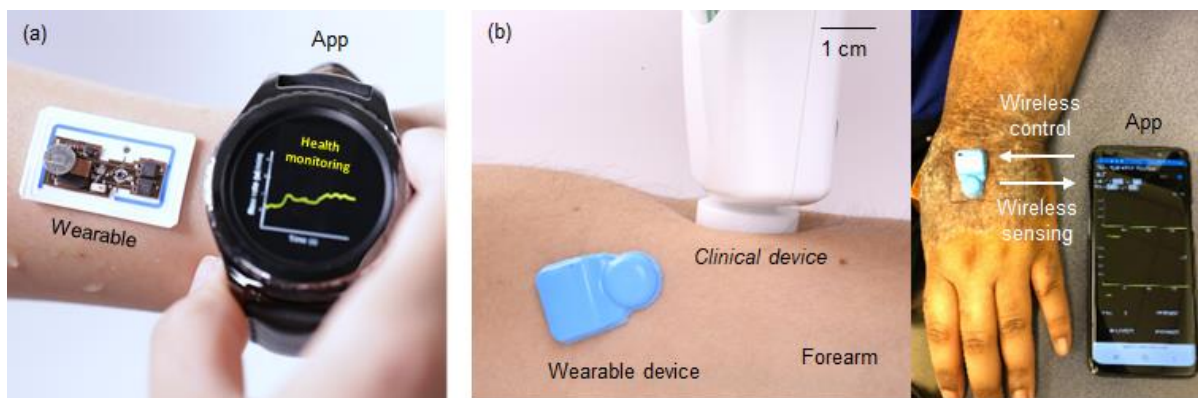


Figure 1. Medical wearables and apps monitoring (a) sweat-related dynamics and (b) thermal transport properties of the skin.

[1] K. Kwon*, H. Wang*, J. Lim, et al. Wireless, Soft Electronics for Rapid, Multi-sensor Measurements of Hydration Levels in Healthy and Diseased Skin, Proceedings of the National Academy of Sciences of the United States of America (PNAS). 2021; 118: 5.

[2] K. Kwon*, J. U. Kim*, Y. Deng*, et al. An on-skin platform for wireless monitoring of flow rate, cumulative loss and temperature of sweat in real time, Nature Electronics. 2021; 4: 302-312.

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