

Hong Kong develops next-gen wearable continuous glucose monitoring system for diabetes management

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An interdisciplinary research team, including the Faculty of Engineering and Li Ka Shing Faculty of Medicine at The University of Hong Kong (HKU), Zhejiang University, and Guangzhou Medical University, in China, has developed a groundbreaking continuous glucose monitoring (CGM) system which represents a major advancement in wearable health technology and is set to revolutionise diabetes management.

The new CGM system, termed OECT-CGM, features a compact, coin-sized design integrating state-of-the-art biosensors, minimally invasive tools, and hydrogels. The core part of the device is the organic electrochemical transistor (OECT), a biochemical signal amplifier that significantly improves the signal-to-noise ratio (SNR) beyond traditional electrochemical sensors. This advancement is critical for providing accurate and reliable glucose readings essential for effective diabetes management.

The OECT-CGM includes a microneedle array for subcutaneous glucose sampling with minimal pain and discomfort, addressing one of the major drawbacks of existing CGM devices, deemed invasive due to the requirement of a needle inserted under the skin, which can cause discomfort. Additionally, a viscoelastic and diffusive hydrogel stabilises the interface between the skin and the device, ensuring the sensor remains secure and effective during use.

The OECTs in the integrated device achieve record-high sensitivity, a significant technical advance for body-centric healthcare. The performance, in rodent tests, is comparable to commercial CGMs currently available in the market.