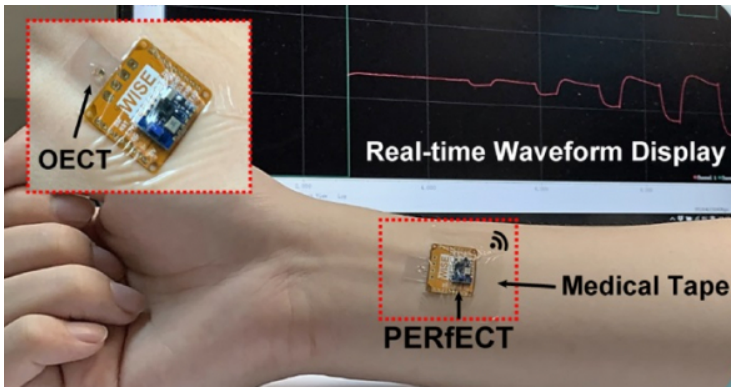
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ASIA EDITION

Hong Kong creates coin-sized wearable biosensing platform

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The technology marks a big step forward for organic electrochemical transistors



A team of researchers from the Faculty of Engineering of The University of Hong Kong (HKU) has developed a coin-sized system that can read weak electrochemical signals, which can be used for personalised health monitoring and measurement of such conditions as diabetes, cardiovascular diseases and mental health.

The PERfECT System – an acronym for Personalised Electronic Reader for Electrochemical Transistors – is the world's smallest system of its kind, measuring 1.5 cm x 1.5 cm x 0.2 cm and weighing only 0.4 gramme.

It is easily wearable, for instance integrated with a smartwatch or as a patch, to allow for continuous monitoring of biosignals such as glucose levels and antibody concentrations in blood and even sweat.

"Our wearable system is tiny, soft and imperceptible to wearers, and it can do continuous monitoring of our body condition. These features mean it has the potential to revolutionise healthcare technology," said Dr Shiming Zhang of the Department of Electrical and Electronic Engineering, who leads the HKU WISE (wearable, intelligent and soft electronics) Research Group to develop the system.

The PERfECT wearable system can also serve as a miniaturised electrochemical station for wearable devices and measure the outputs of other kinds of low-voltage transistors, such as electrolyte-gated field effect transistors and high-k dielectric-gated thin-film transistors.