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Researchers develop sweat-powered battery

Singapore RESEARCHERS at the Nanyang Technological University (NTU) have developed a battery that could use sweat to power wearables such as smart watches and fitness trackers.

The team of three scientists showed that a prototype of the battery was able to power a temperature sensor and send data to a smartphone through Bluetooth.

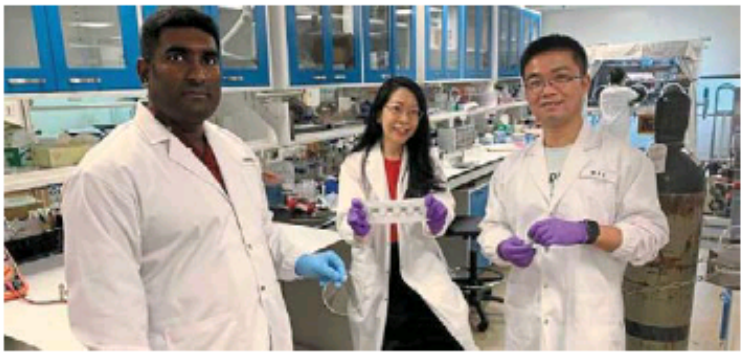
Four of the batteries, which generated a voltage of 4.2V, were worn around the wrist of a person using a stationary bicycle for 30 minutes.

Each battery was made by printing ink containing silver flakes onto a stretchable, sweat absorbent fabric, and measures 2cm by 2cm, about the size of a small postage stamp but thicker.

Separate tests in the laboratory showed that about 2ml of artificial sweat – or about half a teaspoon of liquid – could power a battery for about 20 hours.

When sweat comes into contact with the battery, the chloride ions and acidity of sweat cause the silver flakes to clump together.

This chemical reaction increases the flakes' ability to conduct electricity and work like electrodes to make a current to flow.



We got the power: (From left) Senior research fellow at NTU's School of Materials Science and Engineering (MSE) Dr Gurunathan Thangavel, Prof Lee and research fellow at the MSE Dr Lyu Jian showing a prototype of the battery. — Photo courtesy of NTU Singapore

The NTU battery could be more durable than those using existing technology. It can be used when the wearer is exercising and can withstand repeated exposure to sweat.

And even when the person is not perspiring consistently, the fabric used to make the battery is able to retain a lot of sweat, which allows the battery to be powered.

Unlike other batteries, it does not contain heavy metals or toxic chemicals, so it is potentially more environmentally friendly and can help reduce harmful electronic waste, the university said yesterday.

"By capitalising on a ubiquitous product, perspiration, we could be looking at a more environmentally friendly way of powering wearable devices that does not rely on conventional batteries," said Prof Lee Pooi See, the materials scientist who led the study. — The Straits Times/ANN