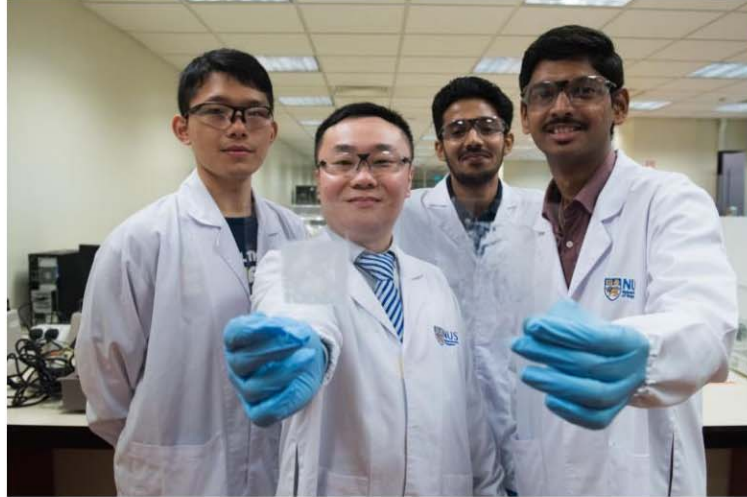


## New 'gel' promises escape from the heat and more, say NUS researchers



(From left) PhD student Mr Zhang Yaixin, Assistant Professor Tan Swee Ching, Mr Dilip Krishna Nandakumar and Mr Sai Kishore Ravi. The research team spent 18 months studying the hydrogel. ST PHOTO: LEE JIA WEN

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Low De Wei

SINGAPORE - At first glance it looks like an ordinary transparent gel but this high-tech concoction from local boffins could help take the heat out of our stifling humidity.

The "hydrogel" devised by researchers from the National University of Singapore (NUS) is a novel application of an existing compound - zinc oxide - used in sunscreens and medication like calamine lotion and eczema creams, which relieve nagging itches.

The researchers have found that the material is highly effective when used as a dehumidifier in a "gel-like" state by coating it on surfaces like walls, windows or decorative items.

The hydrogel outperforms commercial dehumidifiers by absorbing at least eight times the amount of water they can, and can also be produced more easily and cheaply, they say.

Unlike some dehumidifying systems, it does not require electricity. It can also be reused more than 1,000 times by drying it out under sunlight.

Relative humidity levels often hover between 70 to 80 per cent here so sweat evaporates more slowly.

"This causes us to feel hotter than the actual ambient temperature, which leads to great discomfort," said Assistant Professor Tan Swee Ching from the Department of Materials Science and Engineering at the NUS Faculty of Engineering, who led the research.



Tests showed that the hydrogel can reduce the relative humidity in an enclosed space by about 20 per cent, which lowers the perceived temperature by seven to nine degrees Celsius within seven to 10 minutes.

The research team, which spent 18 months studying the hydrogel, found other promising applications as well.

The gel, which turns milky-white after absorbing water, blocks heat from sunlight when coated on windows and so reduces the room temperature, said Asst Prof Tan.

The hydrogel's ability to generate and conduct electricity also allows it to be used as emergency power source or conductive, removable ink on electric circuit boards that can be reused, which reduces electronic waste.

But Asst Prof Tan acknowledges that more studies are needed, including working with industrial partners to design windows and other holding devices for the gel's applications.

For now, the researchers are forging ahead with plans to market the product's dehumidifying abilities.

With funding from Temasek Foundation Ecosperity, a non-profit philanthropic organisation, the researchers plan to produce the hydrogel industrially and test its effectiveness in absorbing water in outdoor and indoor settings in the next 18 months.

Temasek Foundation Ecosperity chief executive Lim Hock Chuan hopes that this will bring potential investors and partners on board to commercialise the hydrogel.

The result, he notes, will "improve the quality of life in Singapore in a sustainable way".