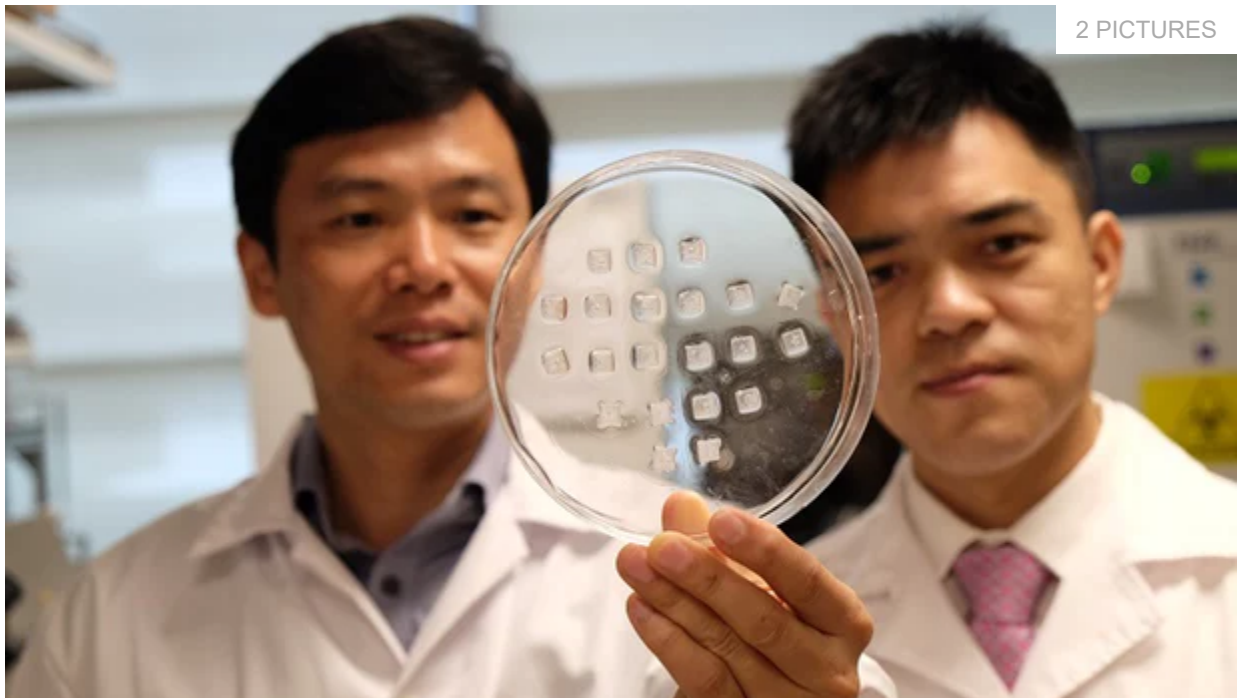




Ben Coxworth 4 hours ago



Prof. Chen Peng (left) and Asst Prof Xu Chenjie, with a batch of the patches (Credit: Nanyang Technological University)

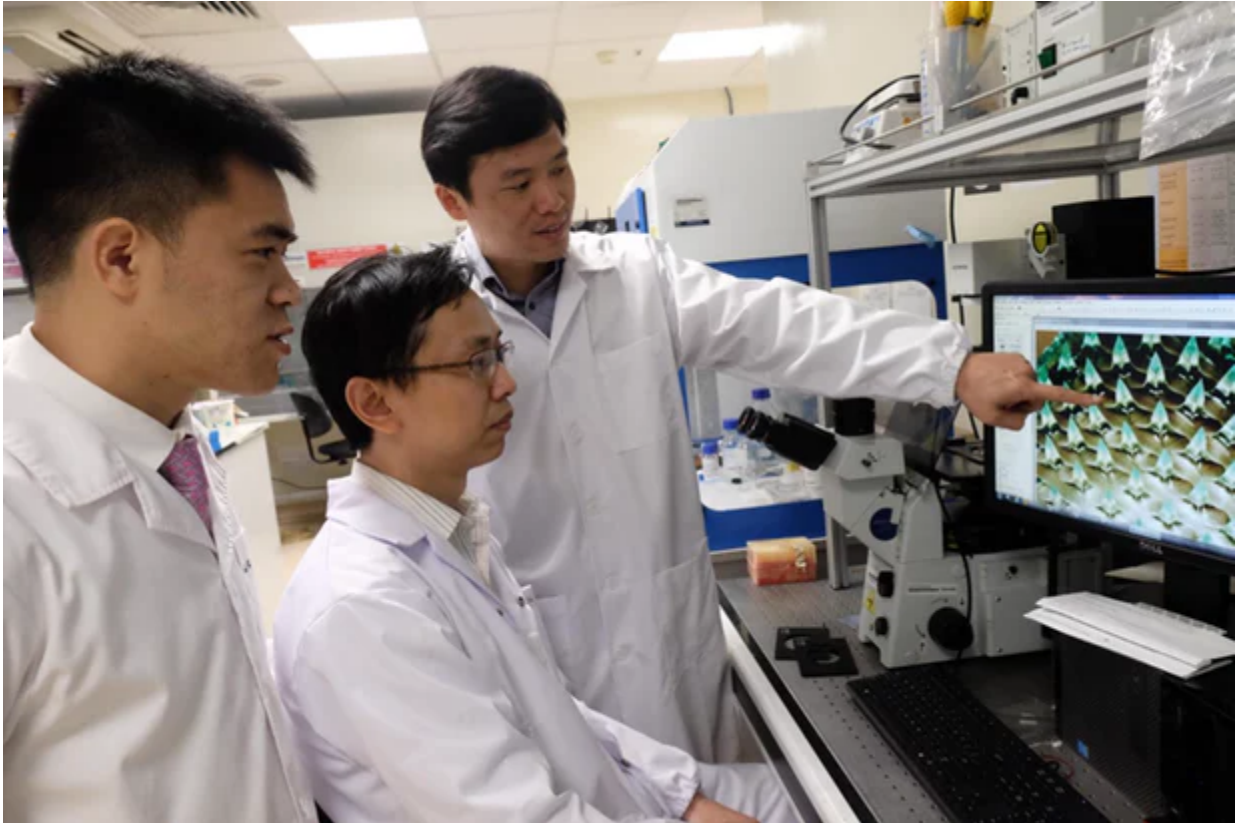
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There are already skin patches that help people quit smoking ... could patches that help them lose weight be far behind? Well, thanks to research being conducted at Singapore's Nanyang Technological University, the things already exist – for mice, at least.

The underside of each patch is covered with hundreds of microneedles, which are loaded with one of two drugs: either Beta-3 adrenergic receptor agonist or thyroid hormone T3 triiodothyronine. Although both have been shown to reduce body fat by converting energy-storing white fat into energy-*burning* brown fat, they can have serious side effects if taken orally or via injections.

That's why the patches were developed.

When they're pressed onto an overweight mouse's body for around two minutes, the microneedles (which are thinner in diameter than a human hair) break off and become embedded in the skin. They then harmlessly dissolve, slowly releasing their drug payload directly where it's needed – into the underlying layer of white fat. The drugs subsequently convert it into brown fat, which gets burned off.



In lab tests, use of the patches on mice that were on a high-fat diet reduced the animals' fat mass by over 30 percent in four weeks. They also had significantly lower blood cholesterol and fatty acid levels compared to a control group of mice.

"With the embedded microneedles in the skin of the mice, the surrounding fats started browning in five days, which helped to increase the energy expenditure of the mice, leading to a reduction in body fat gain," says Asst Prof. Xu Chenjie, who led the research along with Prof. Chen Peng. "The amount of drugs we used in the patch is much less than those used in oral medication or an injected dose. This lowers the drug ingredient costs while our slow-release design minimizes its side effects."

The research is described in a paper recently published in the journal *Small Methods*. A team from Columbia University Medical Center and the University of North Carolina has also developed a skin patch that converts white fat into brown.

Source: Nanyang Technological University