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## New method to administer drugs through the skin using magnets is more efficient, less painful



A\*Star's Dr Daniel Lio (right) demonstrating his team's prototype device that uses two magnets to create temporary micropores to administer drugs more efficiently through the skin. With him are team members Wang Xiaomeng and David Laurence Becker of Nanyang Technological University's Lee Kong Chian School of Medicine. PHOTO: NANYANG TECHNOLOGICAL UNIVERSITY

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Those who feel faint at the sight of a needle have hope with a new drug-delivery method that involves pinching skin with magnets.

Researchers in Singapore found that by using two magnets, temporary micropores can be created to administer drugs through the skin.

Drugs are delivered more efficiently this way, the scientists from Nanyang Technological University (NTU) and the Agency for Science, Technology and Research (A\*Star) said in a recent paper published in Science Advances.

The team found that by bringing together two magnets so that they pinch and apply pressure to a fold of skin, short-term changes occur in the skin barrier, leading to the formation of "micropores" underneath the skin surface.

The lead author of the paper, Dr Daniel Lio of A\*Star, said that while needles and microneedle injections damage the skin, micropores could pave the way for painless transdermal delivery of drugs such as insulin.

With conventional injections, the skin has to be penetrated and there is a risk of a hypoglycaemia effect, when the injected insulin acts too fast and the patient is left dizzy.

The new method allows for a slower delivery of drugs without breaking the skin, thus causing less pain.

There is another benefit. In studies done on mice, the researchers found that up to six times the amount of drugs passed through the skin when administered this way, compared with mice that did not receive the drugs via the "temporal pressure treatment".

"Our research project was first inspired by the traditional Chinese medicine tuina therapy, where physicians rub and apply pressure on skin and muscle tissue and apply a topical ointment," said Dr Lio of the study, which is two years in the making.

This multidisciplinary project is a collaboration between A\*Star, NTU and the National Skin Centre, and is supported by the Skin Research Institute of Singapore.

The team has filed a patent for a pressure device and is currently conducting further experiments to refine the drug-delivery mechanism.

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