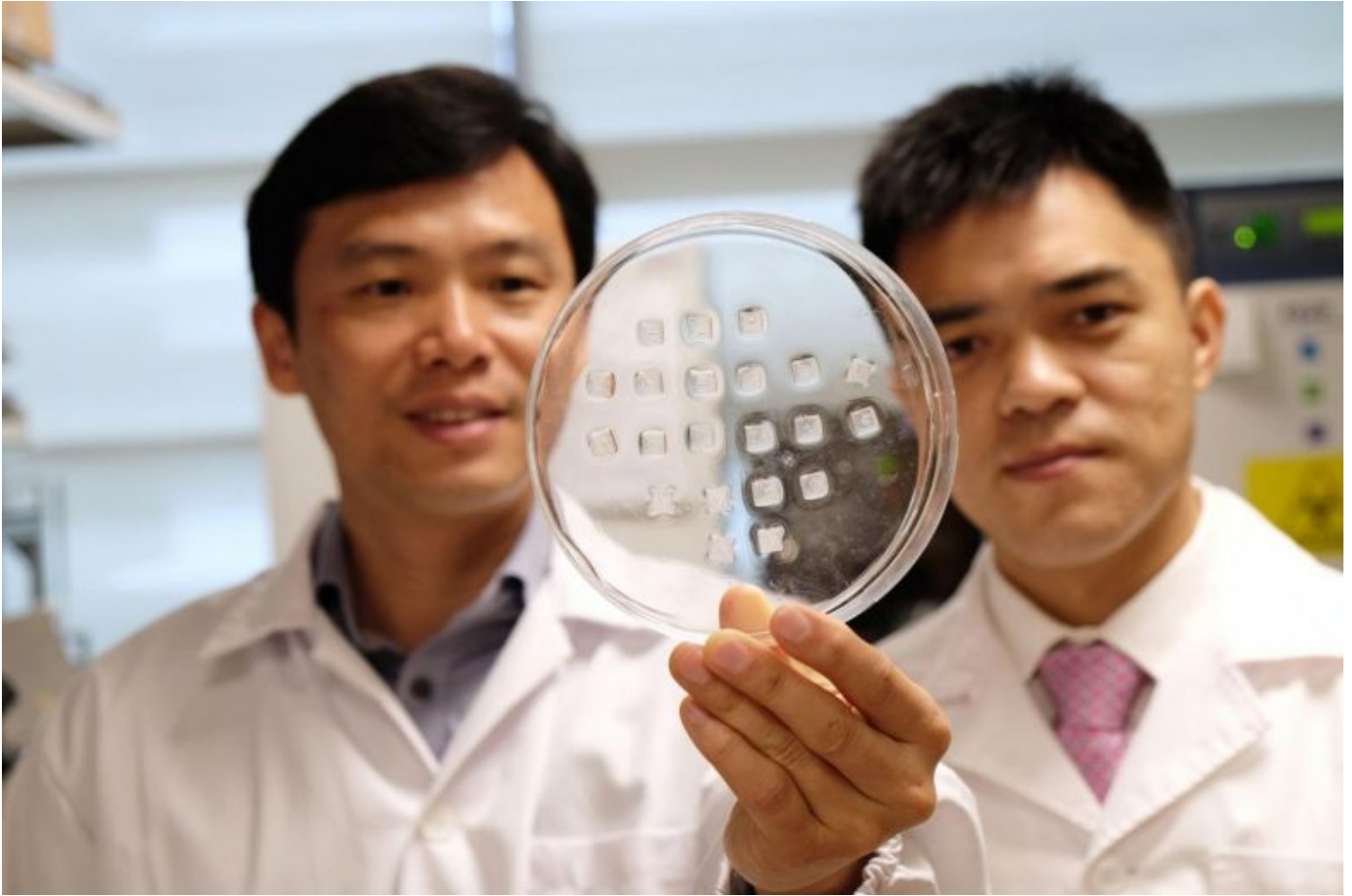


NTU team comes up with skin patch to combat obesity



Professor Chen Peng (left) and Assistant Professor Xu Chenjie holding a skin patch that allows anti-obesity medication to be delivered directly to the fat under the skin. PHOTO: NANYANG TECHNOLOGICAL UNIVERSITY

🕒 PUBLISHED DEC 28, 2017, 1:40 PM SGT | UPDATED DEC 28, 2017, 7:17 PM

✉
Cheow Sue-Ann (mailto:sueannc@sph.com.sg)

SINGAPORE - Researchers here have come up with a skin patch that allows anti-obesity drugs to be administered with a lower risk of side effects.

A team from Nanyang Technological University (NTU) shared details of the skin patch with the media on Thursday (Dec 28).

The new drug delivery method reduced weight gain in mice on a high fat diet and their fat mass by more than 30 per cent over four weeks.

The NTU team of eight has been working on the project since 2015 and it has just completed the animal trial stages. The skin patch will be tested on humans only in a year or two.

According to the team, it will be anything between five and 10 years before the patch is able to hit the market.

Each skin patch is just 1 cm square in size but contains hundreds of micro-needles that allow anti-obesity medication to be delivered directly to the fat under the skin.

Such medication helps to reduce unhealthy white fat, converting it into an energy-burning brown fat, which is healthier.

The patch has to be pressed into the skin for about two minutes, during which the micro-needles will become embedded in the skin and detach from the patch.

From its tests on mice, the NTU team found that the patches can reduce weight gain and fat mass in mice on a high-fat diet by more than 30 per cent in under four weeks.

Professor Chen Peng, one of the team's two principal investigators, noted that not many adult anti-obesity drugs are approved by the United States Food and Drug Administration, as high dosages are often required.

High dosages carry a risk of side effects, which can include heart palpitations, headaches and increased blood pressure, he added.

He said: "With the patch, we will administer the drug directly onto the fat, allowing for the dosages to be reduced significantly."

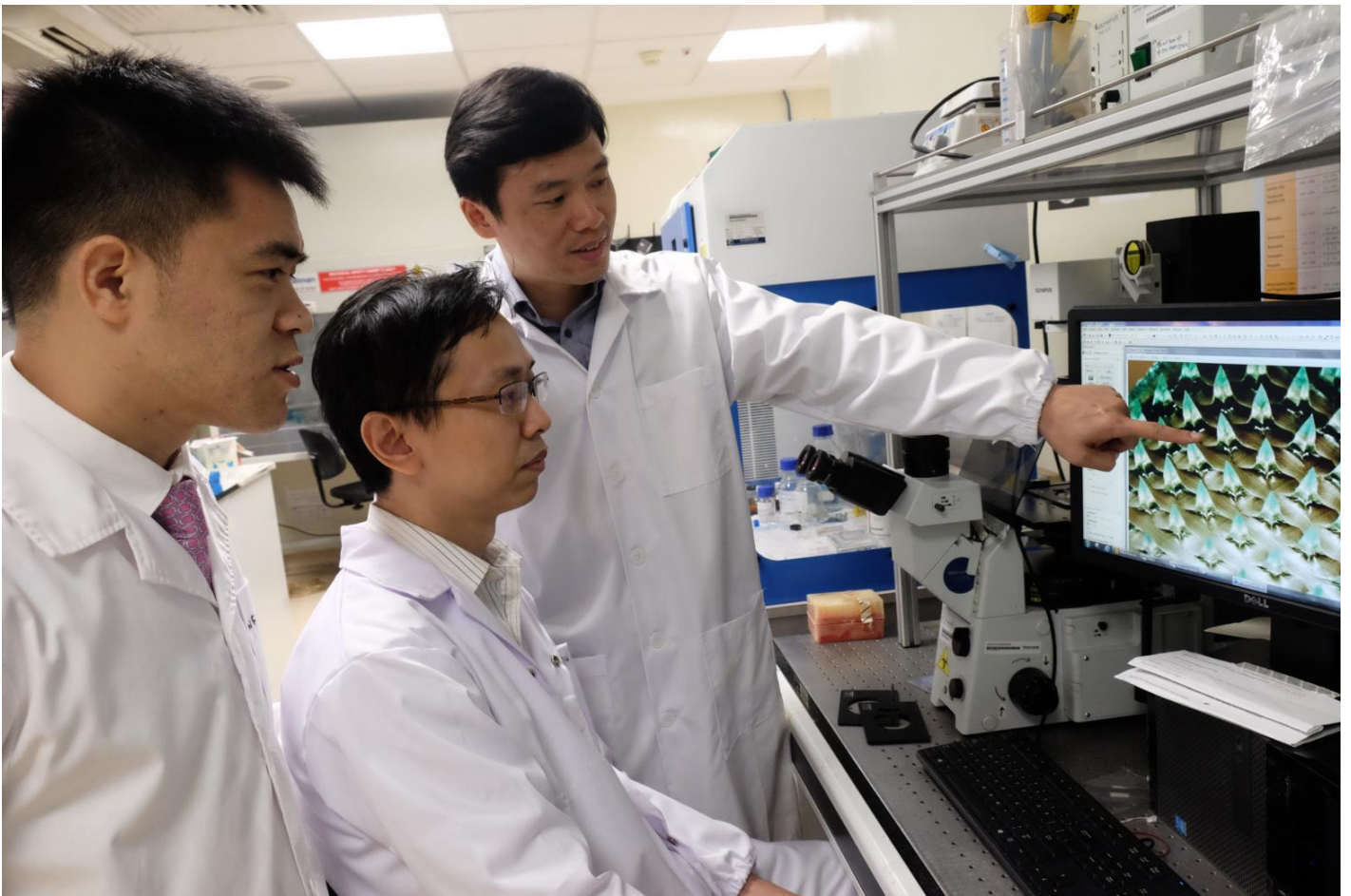
Prof Chen said the reduction in dosage is estimated to be more than 20 times less than pre-existing oral medications.

The drugs used by the NTU team - the Beta 3 adrenergic receptor agonist or T3 thyroid hormone - are both hormone-based and will instigate cells to change their genetic make-up.

They will cause fatty cells to produce more metabolic components such as mitochondria to increase energy production and fat metabolism, transforming the cells from energy-storing to energy-burning ones.

Prof Chen said: "Beyond dealing with obesity, there are other potential uses for the patches, including reducing cholesterol levels and other fat associated conditions."

The NTU team is also looking into cosmetic uses for the skin patch.



(From left) Assistant Professor Xu Chenjie, Dr Than Aung and Prof Chen Peng conducting research at a laboratory. PHOTO: NANYANG TECHNOLOGICAL UNIVERSITY

The needles are made of bio-compatible polymers, such as hyaluronic acid found in products such as moisturisers. The needles will degrade in the body, releasing the drug slowly.

Prof Chen said this new method will enable the problem of obesity and its associated conditions, such as diabetes and hypertension, to be solved with a lower risk of side effects.

"Right now, there's no way to treat obesity, allowing it to create a great social and clinical burden," he said.

Said Prof Chen: "While the patches have been highly effective in mice, we predict that they will be even more so with humans, because we have our fat layer directly under the skin. The needles will be able to reach the fat even more efficiently."