

# New method to detect abnormal scar formation

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Scientists have developed a non-invasive way to detect how scars will develop after surgery or burn wounds so doctors can take preventive measures.

The new detection method – devised by researchers here and in the United States – uses thousands of nanoparticles called NanoFlares with DNA strands attached to their surfaces, like a ball with spikes.

These nanoparticles are applied to closed wounds using a cream.

After they have penetrated the skin cells for 24 hours, a handheld fluorescence microscope is used to look for parts of the skin that light up. This indicates abnormal scarring activity.

Preventive measures such as using silicon sheets to keep a wound flat and moist can then be taken to avoid heavier scarring.

The technique was developed by scientists from Nanyang Technological University (NTU) and Northwestern University in the US.

The team was led by Assistant Professor Xu Chenjie from NTU's School of Chemical and Biomedical Engineering, Professor Chad Mirkin, a nanoscience expert from Northwestern University, and Dr Amy Paller, chair of dermatology at Northwestern University Feinberg School of Medicine.

Apart from visual examination of mature scars, the only other way to detect abnormal scarring is by performing a biopsy, where a skin tissue sample is extracted and sent for

laboratory testing.

But biopsies may be painful and inconvenient for patients.

“Formation of abnormal scars can also cause emotional and physical damage to patients. These scars can also influence people’s mobility. However, this new method will help to minimise these issues,” said Prof Xu.

The cost of the new method is about \$10 per application.

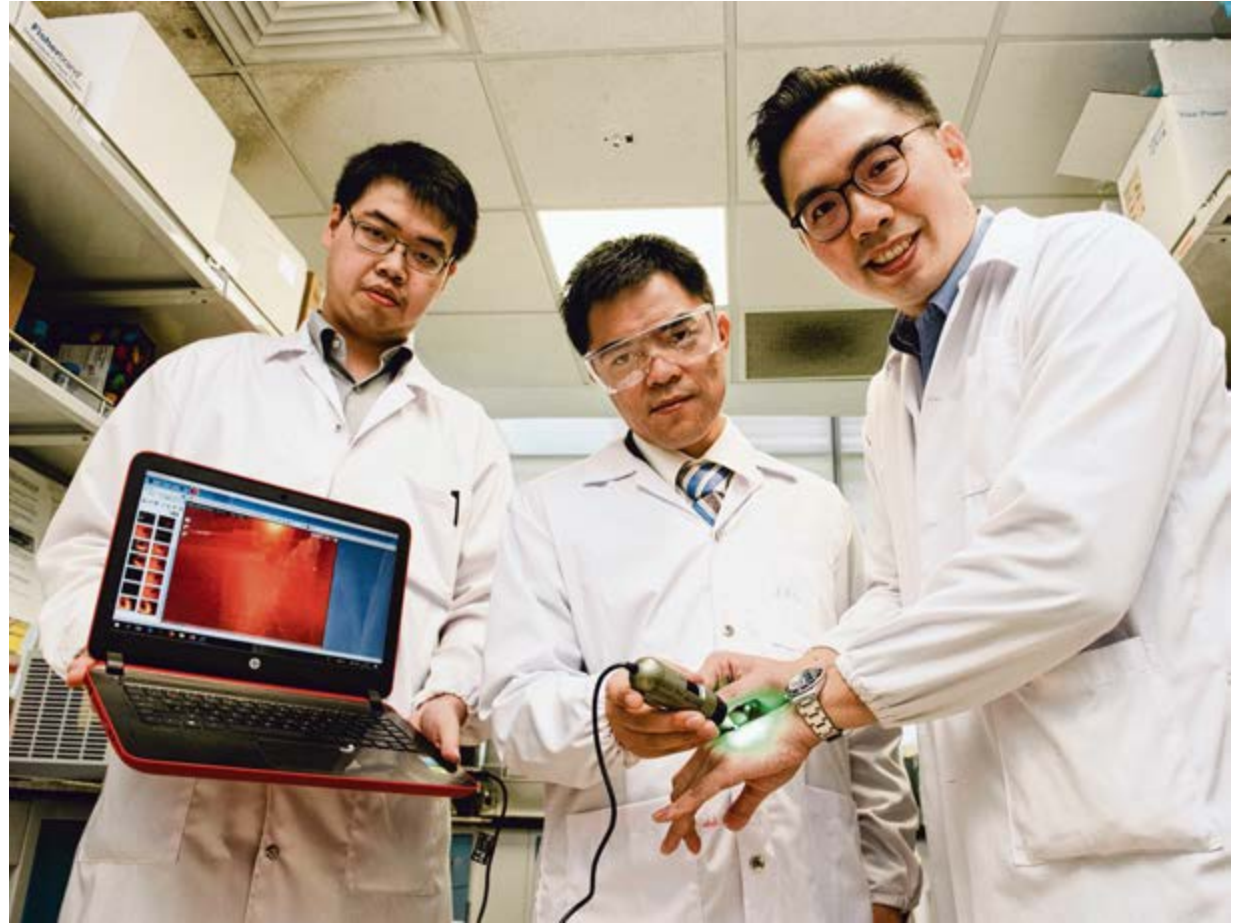
The team has filed a patent application based on this technology through NTU’s innovation and commercialisation arm, NTUitive, and will conduct a clinical trial by mid-2019.

Other than detecting abnormal scarring, this new method can be engineered to detect other skin diseases like skin cancer, which rely heavily on biopsies for detection.

“This technology that can provide non-invasive biopsy can potentially be very helpful in clinical practice, and its applications should certainly be further explored,” said Dr Hong Liang Tey, dermatologist and head of research at National Skin Cancer.

One in 12 people undergoing surgical procedures here develops scars.

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Members of the team involved in the nanoparticle technology research include (from left) research fellows Christian Wiraja and David Yeo (principal investigator) as well as Assistant Professor Xu Chenjie. ST PHOTO: ALVIN HO