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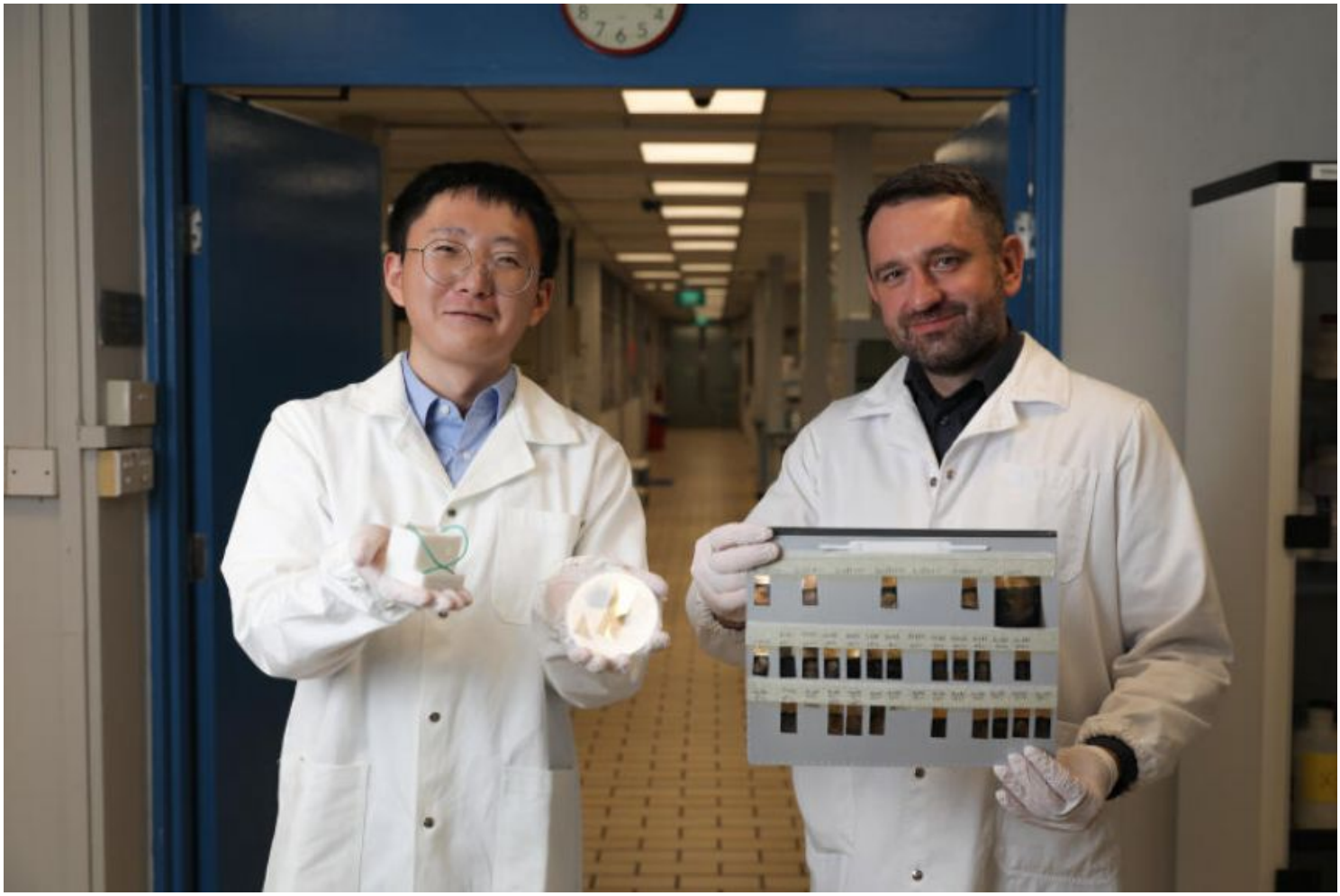
NTU team develops 3D mapping device to improve diagnosis and treatment of skin conditions



Researcher Fu Xiaoxu and Assistant Professor Grzegorz Lisak with the device. ST PHOTO: ONG WEE JIN

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SINGAPORE - A team from the Nanyang Technological University (NTU) has developed a portable device that can create 3D images of the skin within minutes, which will enhance the diagnosis and treatment of skin conditions and injuries.

The 3D mapping measures the thickness, length and depth of skin ridges, which is useful in assessing the severity of skin conditions like eczema and psoriasis rashes, said Dr Yew Yik Weng, a consultant dermatologist at the National Skin Centre and an assistant professor at NTU's Lee Kong Chian School of Medicine.

As such mapping also shows the ridges and grooves of the skin at up to 2mm, it could also help with the monitoring of wound healing and fingerprint identification in forensic analysis.

Dr Yew said that clinicians currently rely on photographs and measurements that give 2D assessments of skin, which are not always accurate due to factors like poor lighting.

Mr Fu Xiaoxu, a researcher on the team, added that the technology used today can be time consuming and costly at times.

The PhD student from NTU's School of Civil and Environmental Engineering said: "There was a certain need for us to develop a portable, economical and fast skin mapping technique to help dermatologists do diagnosis and treatment."

The battery-operated device weighs 100g and creates 3D maps of skin within 10 minutes. It costs $30 to make and is reusable.

A 3D map is created by pressing a specially devised film on the skin. Oil from the skin will be imprinted onto the film, which is then placed in the device where it is subjected to an electric charge that develops the 3D image.

Assistant Professor Grzegorz Lisak from NTU's School of Civil and Environmental Engineering, who led the research, said that substances used in the film are not toxic to the skin and it would only be used on wounds that are no longer bleeding.

Besides the ridges and grooves, the film can also capture the complex network of wrinkles on the back of a human hand and features on uneven skin areas, such as the creases of an elbow and fingerprints.

Dr Yew said: "The device could offer a higher degree of accuracy when it comes to differentiating between similar prints, due to the 3D nature of its imagery."

This makes it possible for the device to be used to enhance forensic analysis.

The portable skin mapping device and a high-resolution 3D map of a fingerprint. ST PHOTO: ONG WEE JIN

Currently, the device is in its prototype stage.

Prof Lisak said: "The next step is to go for clinical trials which will be attempted this year, where we can have a bigger pool of subjects to further validate the usefulness of this technology".

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