NTU scientists print human skin that matches natural pigment

**Breakthrough could potentially replace animal testing and help burn and diabetic patients**

Scientists from Nanyang Technological University (NTU) have managed to print human skin in batches of human skin that look like the real thing.

"It has been a dream for some time to be able to match the colour found naturally on the human body -- and researchers have told The Straits Times that they believe their breakthrough has the potential to change science and medicine."

"We are the first to do this in the world," said Dr Young. "The bioprinting project is a collaboration between NTU's Singapore Centre for 3D Printing and the Singapore Institute of Manufacturing Technology at the Agency for Science, Technology and Research."

"The "ink" made of three types of skin cells -- keratinocytes, melanocytes and fibroblasts -- into a special printer along with a soft collagen gel. Over several days, the raw materials are laid down in precise patterns that result in the natural-looking, dermatologically-healthy skin. In a matter of four weeks, the skin construct is ready for tearing and will result in blotchy and uneven pigmentation, Dr Young said."

"The skin construct is then cultured for four weeks before it is ready to be harvested," said Dr Young. "The printed skin is dotted with hair follicles, blood vessels and sweat glands."

"But the "ultimate dream" is to be able to print skin for medical purposes, according to Dr Young. "There is interest in NTU's school of mechanical and aerospace engineering in the use of bioprinting in orthopaedics and even in regenerative medicine."

"However, this can take time that burn victims or diabetics might not have."