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UAE

Medical scientists operating the world's first machine that produces personalised human skin tissue therapy.

Human skin graft technology restores burn-damaged skin

DUBAI

The team is in the continuous research and development of Regenerative Medicine innovations for the re-growth, repair and replacement of damaged skin cells

A customised human skin graft technology clinically proved to restore burn-damaged skin is being presented at the "Arab Health 2023," held until February 2 (Thursday) in Dubai World Trade Centre with at least 3,000 companies from 163 countries exhibiting over 1,000 products and services aligned with the theme "Innovation and Sustainability in Healthcare."

The technology is called denovoSkin which medical scientist Dr. Daniela Marino and her colleagues began researching on from their laboratory work at the University of Zurich in 2001. Its Phase One clinical trials began in 2014 at the University Children's Hospital-Zurich (UCH-Zurich) with initial findings paving the way for the establishment of the CUTISS life-science start-up three years later, also a spin-off of the 190-year-old educational institution and the 149-year-old largest paediatric entity in Switzerland.

The CUTISS co-founder/chief executive officer, whose ambition to become a medical scientist was nurtured from age seven, was remotely interviewed before the Monday opening of the regional event which also operates online until March 2 (Thursday). The post-doctoral research work of the Biotechnology degree holder was on vascular biology and skin engineering: "I told my dad I wanted to play with cells, to find solutions to problems. My first encounter with skin opened the path for my post-doctoral work on skin tissue engineering. Soon after starting my research career, I had to raise funds to take the skin graft that we were researching towards clinical trials in patients. Once I saw the first clinical results, I knew it; I had to take this farther and make this skin tissue therapy available to the benefit of millions of people."

For the benefit of everyone needing the innovative therapy, Marino repeated what Wellth (Aster DM Healthcare Integrative Medicine Hub) clinical dietitian Rana Ghazal had told Gulf Today in a previous interview regarding skin being the "largest (body) organ (that) plays a vital role in protecting the body from (both external and internal damage which) carries a significant impact on self-esteem and confidence."

Marino said: "Skin is our largest organ, complex in its makeup and the first line of defence against disease and injury. It protects our body. It is part of our identity. When it becomes damaged or appears different from others, it can cause significant physical and psychological issues. Researchers are still working on to uncover the secrets of how to help heal, treat and mimic this essential human tissue. To date, no one has succeeded in fully replicating human skin organ. Our approach to bioengineering skin is very promising and has shown both proof and safety in clinical studies."

She clarified that their team is in the continuous research and development of Regenerative Medicine innovations for the re-growth, repair and replacement of damaged skin cells and human skin tissue. Thus, though they "applied (it) to patients that removed scars," the personalised human skin graft technology is "meant to treat very deep burns, where the epidermis and dermis are injured. Sunburns only injure the epidermis."

The first successful "large scale transplantation" of the customised skin graft was reported on May 25, 2021. The recipient was a patient at the UCH-Zurich where the Phase One clinical trials began in 2014 and completed in 2021. Ninety-five per cent of the total body surface area (TBSA) of the child was harmed by deep flame burn: "A total of 1,686 square centimetres (of the bio-engineered dermo-epidermal skin graft derived from a single, postage stamp-sized piece of healthy skin from the patient grown in a highly specialised laboratory in large quantities) was transplanted onto the patient, approximately 90 per cent TBSA, (with ease of handling and application, 80 to 90 per cent engraftment rates). It was soft and solid, close to natural skin coverage after a maturation process."

A December 2022-published research study done in a hospital in Ethiopia quoted the 2018 World Health Organisation data revealing that up to 300,000 people worldwide die each year from fire-related burns. The study also stated that the commonest burn injury across all ages was scalding while mostly adults and the elderly either suffer from or succumb to electrical and flame burns.

Marino said their participation at "Arab Health 2023" with other Swiss healthcare and allied companies was brought about by "the clear potential to establish a hub in the Middle East to serve Asia and Africa." They are looking for investors.

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