Skin patch speeds healing while reducing scarring

Rich Haridy 3 hours ago

The research paves the way for a gel patch that both speeds up wound healing and reduces scarring (Credit: Nanyang Technological University)

Scientists have struggled to develop a single substance that can both speed up wound healing and reduce the formation of scars. Scar reduction medications tend to interfere with the natural process of healing, but now a team of researchers has created a novel skin patch that can reduce scarring and increase the pace of wound healing.

The team from Nanyang Technological University in Singapore discovered a key protein called Angiopoietin-like 4 (ANGPTL4) plays several roles over different phases of healing. ANGPTL4 not only reduces inflammation and induces new cell growth, but in later stages of healing it produces molecules that interfere with a key protein that induces scar tissue.

Excessive collagen production is a key factor in the scarring we are familiar with when a wound heals. The key to the new innovation was developing a way to modulate
collagen production without turning it off completely, as it is fundamentally necessary for wound repair.

"To reduce scars, all we had to do was to find a 'tuning knob' that controls the amount of collagen produced, instead of turning it off completely which is what typical anti-scarring medicine does, and which could interfere with the healing process," say one of the authors of the new study, Associate Professor Andrew Tan.

After investigating the anatomical pathways that result in scar production, the team honed in on a protein called Scleraxis. This protein is vital in the formation of tendons, which share structural similarities to scar tissue and are made of densely packed parallel arrays of collagen. Scleraxis was found to be inhibited by ANGPTL4, which results in a reduction in production of scar collagen.

The study notes that ANGPTL4 has been previously identified as enhancing the pace of wound repair, but this is the first time it has been implicated as an effective scar-reduction tool. The research suggests the protein could be useful as a treatment for other fibrotic diseases, including keloids, which is a type of scar that is larger than the wound that caused it.

"In addition, we have developed ways to package ANGPTL4 into easy-to-use formulations such as gel patches, topical creams and injectable microcapsules," says Assistant Professor Cleo Choong. "This will make it easy for doctors and even patients to use in future, should the product be made available to the market."

The study was published in the journal *Scientific Reports*.

Source: Nanyang Technological University

TAGS #HEALING #REPAIR #SKIN #WOUND