Docket #: S19-318

Use of Verteporfin for Prevention of Skin Scarring

The Longaker lab at Stanford University has recently discovered that local injection of the drug Verteporfin after wounding can reduce scarring, improve the strength of healed skin, and regrow the hair follicles and sweat glands that are usually lost during the scarring process. Verteporfin has the potential to prevent millions of patients around the world from suffering with large, distressing scars.

Hundreds of millions of patients worldwide develop new scars every year, and scars and their associated problems cost the United States over $20 billion every year. Despite the high demand for scar treatments, there is currently no drug on the market that can successfully prevent or reverse scarring. The Longaker lab has uncovered the cell signaling process that results in scarring and have found that the FDA approved drug Verteporfin can dramatically reduce scarring and improve wound appearance when injected directly after wounding. When wounded mice were injected with Verteporfin, their healed connective tissue was stronger than scarred skin and their healed skin closely resembled healthy, unwounded skin. Further, while typical scarred skin lacks hair follicles and sweat glands, Verteporfin allowed the regrowth of these very important skin elements.

While the Longaker lab knows that Verteporfin has the potential to dramatically improve scarring of wounded skin, they also postulate that this treatment could have positive effects on other fibrotic processes present in other areas of the body. Given that Verteporfin is already FDA approved as an injectable, this drug is already known to be clinically safe.

Stage of Development
Proof of Concept

Applications

- Treatment of incisions that normally result in large scars
- Potentially applicable to other fibroses of skin and body

Advantages

- Improved scarring outcomes: reduced scarring, stronger healed skin, improved scar appearance
- Regrowth of skin elements, including: hair follicles, sweat glands
- Can be administered close to time of surgery

Publications

- Shamik Mascharak et al. (2021) Preventing Engrailed-1 activation in fibroblasts yields wound regeneration without scarring. *Science* 372, eaba2374.
- Shamik Mascharak, Heather E. Talbott, Michael Januszyk, et al. (2022). Multi-omic analysis reveals divergent molecular events in scarring and regenerative wound healing. *Cell Stem Cell* 29(2):315-327.e6.

Patents

- Published Application: WO2021021607

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