Materials and methods

**Ex vivo full-thickness skin organ cultures.** Skin specimens from healthy donors were obtained for *ex vivo* assays. Biopsies were cultured as follows: A hole was punched in a Transwell filter (pore size 1 µm; Beckton Dickinson Labware). The biopsy was inserted into the hole, and the filter containing the biopsy was placed in a 12-well culture plate (Beckton-Dickinson Labware) with Dulbecco’s modified Eagle’s medium (DMEM; Gibco) containing 10% fetal bovine serum (FBS; Gibco), 2 mM L-glutamine (Gibco) and antibiotics (100 IU/ml penicillin G, 100 µg/ml streptomycin; Gibco). In this system, the epidermis faces upwards at the liquid-air interface whereas the dermis is suspended in the culture medium. The tissue was incubated at 37°C in a humidified atmosphere containing 5% CO₂. Healthy skin biopsies were stimulated with recombinant human TNF-α protein (R&D Systems), at 20 ng/ml for 24 h.

**Normal human epidermal sheets and dermis.** Normal human epidermal sheets and dermis were isolated from healthy donors as previously described (1). Epidermal sheets were cultured in DMEM (Gibco) containing 10% fetal bovine serum (FBS; Gibco), 2 mM L-glutamine (Gibco) and antibiotics (100 IU/ml penicillin G, 100 µg/ml streptomycin; Gibco) and stimulated with TNF-α (R&D Systems) at 20 ng/ml for 24 h.

**RNA extraction, cDNA synthesis and qRT-PCR.** Ex vivo full-thickness skin organ cultures, normal human epidermal sheets were snap-frozen in liquid nitrogen and stored at -70°C until RNA extraction.

Reference

Figure S1. Gene expression of (A) Tyr and (B) BMP-4 in normal human epidermal sheet cultures treated with TNF-α (20 ng/ml) or untreated for 24 h. Gene expression of (C) Tyr and (D) BMP-4 in *ex vivo* healthy skin organ cultures treated with TNF-α (20 ng/ml) or untreated for 24 h. Data are presented as the mean ± standard deviation. *P<0.05 vs. matched controls. Tyr, tyrosinase; BMP, bone morphogenetic protein; TNF-α, tumor necrosis factor-α; EP, epidermal sheet; OC, organ culture.