

## Accepted Manuscript

Title: The Role of Estrogen in Cutaneous Ageing and Repair

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**Highlights** Pathological wound repair remains a major area of unmet clinical need.

- 17 $\beta$ -estradiol deficiency contributes to both skin ageing and poor wound healing.
- 17 $\beta$ -estradiol treatment restores normal healing and protects against infection.
- Selective estrogen receptor modulators (SERMs) offer a potential future alternative to 17 $\beta$ -estradiol for clinical use.
- Further molecular and mechanistic studies are needed to develop novel therapeutics.

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**Abstract**

Combined advances in modern medical practice and increased human longevity are driving an ever-expanding elderly population. Females are particularly at risk of age-associated pathology, spending more of their lives in a post-menopausal state. Menopause, denoted by a rapid decline in serum sex steroid levels, accelerates biological ageing across the body's tissues. Post-menopause physiological changes are particularly noticeable in the skin, which loses structural architecture and becomes prone to damage. The sex steroid most widely discussed as an intrinsic contributor to skin ageing and pathological healing is 17 $\beta$ -estradiol (or estrogen), although many others are involved. Estrogen deficiency is detrimental to many wound-healing processes, notably inflammation and re-granulation, while exogenous estrogen treatment widely reverses these effects. Over recent decades, many of the molecular and cellular correlates to estrogen's beneficial effect on normal skin homeostasis and wound healing have been reported. However, disparities still exist, particularly in the

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