

# Leonurine (SCM-198) for Skin Wound Healing

## Improvement via smart transdermal delivery

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## Abstract

### Background

Leonurine (SCM-198) has been widely explored in recent years for its strong anti-inflammatory, anti-oxidant, pro-angiogenic, and cardiac fibrosis-reducing properties. These physiological processes provide the potential for chronic wound healing and reduce skin fibrosis.

### Method

In this investigation, SCM-198 was placed in a carbomer hydrogel substrate and administered in a copper sheet rat burn model. A positive control group consisted of basic fibroblast growth factor (bFGF) hydrogel that was readily available commercially. Hematoxylin-Eosin (H&E) and Masson staining of sections were used to analyze histological changes in wounds; immunohistochemistry was used to detect collagen I and collagen III in wound tissue; and real-time fluorescence quantitative polymerase chain reaction (qPCR) was used to investigate the molecular mechanism of SCM-198 in the treatment of burns.

### Results

The results showed that the skin wound healing rate in the SCM-198 group reached over 95%. During the proliferative phase, the SCM-198 group showed a thickened collagen layer and an upregulation of vascular endothelial growth factor (VEGF)

expression, which was not different from that of the bFGF group. During the remodeling phase, the SCM-198 group had a smaller wound area and epidermal thickness closer to that of the normal group; the collagen I content did not differ from the normal group, and the expression of transforming growth factor (TGF)- $\beta$ 1 and collagen I was significantly lower than that of the bFGF group. Interleukin (IL)-1 $\beta$  and IL-6 mRNA expression were both significantly downregulated in the SCM-198 group.

**Conclusions**

These results suggest that SCM-198 can promote wound healing, is anti-inflammatory, and has potential application in reducing skin fibrosis. This article is the first time SCM-198 has been used in the treatment of chronic wounds. SCM-198 hydrogel offers a novel approach to promoting wound healing and reducing skin fibrosis.

**Keywords:** Leonurine; rat burn model; wound healing