

SBD.4-Based Wound Dressings: the “Green” Revolution in Chronic Ulcer Management



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Better by Design

PRESENTATION

Chronic wound dressings usually exist either as plain botanical (seaweed alginates) or plain synthetic (nearly everything else). Here we present a hybrid wound dressing which interweaves a highly purified botanical isolate from a medicinal plant (*Angelica sinensis* – SBD.4) with a state of the art nanosilver hydrocolloid matrix. The *Angelica sinensis* extract used in this dressing has been developed at Sunny BioDiscovery under a grant from the National Institute on Aging, standardized and tested in genetically diabetic, human skin transplant (Fig. 1) and age-impaired wound models. Furthermore, its mechanism of action was tested in zebrafish (Fig. 2) and on human skin substitutes by DNA microarray (Fig. 3), revealing bioactivity profile consistent with skin repair and regeneration. Added to various silver-containing wound dressings, SBD.4 enhanced collagen deposition (Fig. 4) and cellular metabolism, required for tissue repair. Combination of SBD.4 with EuroMed's nanosilver hydrocolloid support resulted in a new wound dressing successful in clinical management of difficult diabetic ulcers (Fig. 5).

CONCLUSION

SBD.4 is the next generation botanical ingredient scientifically designed to enhance the performance of a variety of wound dressings, while giving them a “Green” image. It is thus demonstrated that “green” botanical wound dressings can be scientifically developed to improve the management of chronic cutaneous lesions.

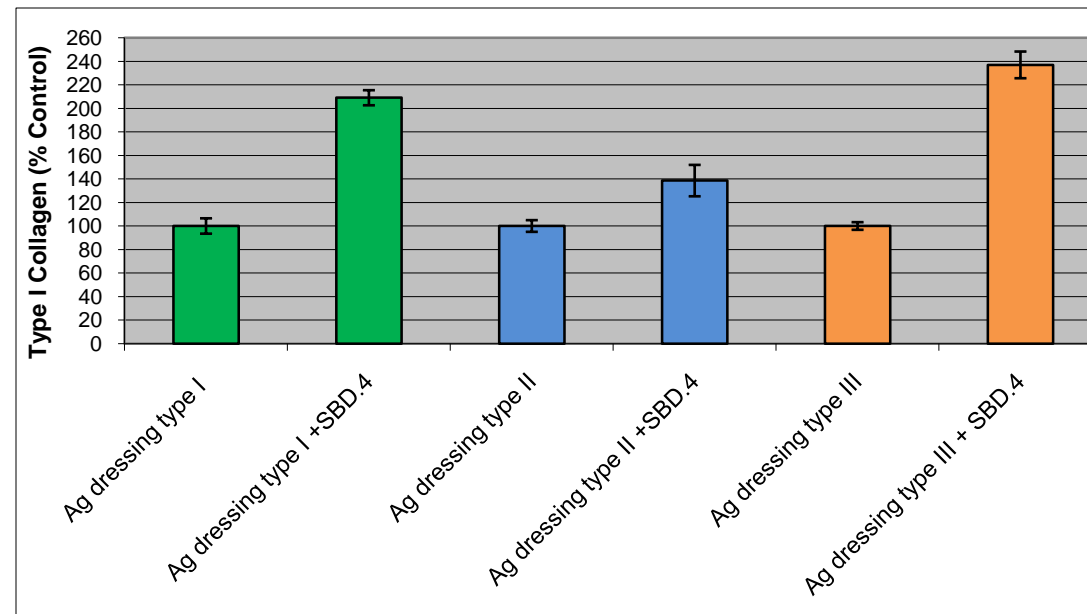


Fig. 4. Type I collagen deposition by human dermal fibroblasts in the presence of 3 different silver-containing wound dressing extracts, without or with the addition of SBD.4. Addition of SBD.4 results in the increase of collagen deposition in all three cases.

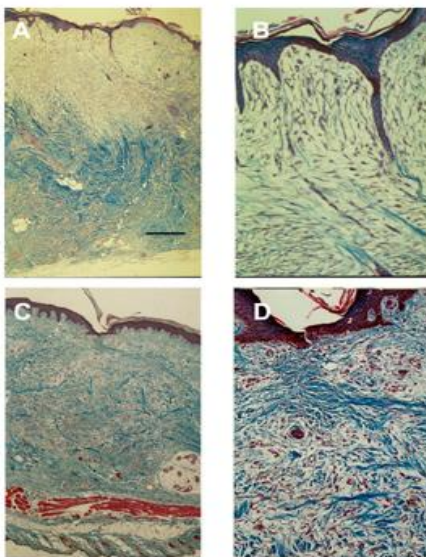


Fig. 1. SBD.4 (C, D– low and high mag.) ups collagen deposition (blue stain) and angiogenesis, as compared with control (A, B) in healing full-thickness wounds in human skin grafted on immuno-deficient mice.

References:
Zhao et al.,
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technology

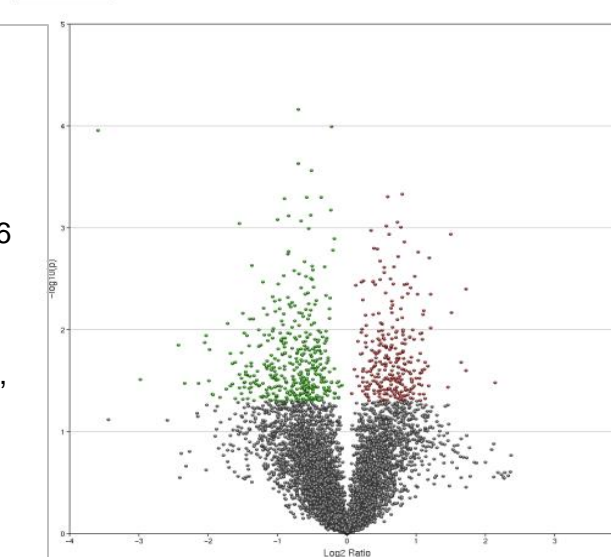


Fig. 3. Effect of SBD.4 on gene expression in EpiDerm FT by DNA Microarray analysis. Green and red dots represent genes, respectively inhibited & enhanced by SBD.4.

Genesifter analysis identified gene categories (Ontologies) relevant to wounds, which included:

- Positive regulation of nutrition & metabolism
- Positive regulation of free radical removal
- Positive response to wounding

➔ **Enhanced wound healing & tissue regeneration**

- Positive regulation of cell polarity
- Positive regulation of cell communication

➔ **Increase of healed tissue strength** (confirmed in the rat incisional wound model by tensiometry – results not shown)

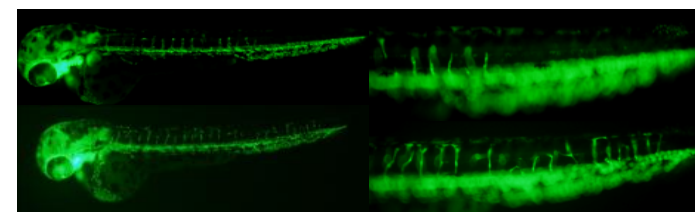


Fig. 2. SBD.4 (lower panels, low and high magnification) stimulates angiogenesis as compared with control (upper panels, low and high mag.) in zebrafish with blood vessels expressing green fluorescent protein.



Fig. 5. Typical effect of SBD.4-nanosilver hydrocolloid (Euromed, Inc.) hybrid wound dressing on chronic ulcers. Diabetic leg ulcer on Treatment Day 0 (A) and Treatment Day30 (B).