

## Research Compact

### Tags

octenilin® wound gel, wound, molecular effects

### Title

## Comparative assessment of commercially available wound gels in ex vivo human skin reveals major differences in immune response-modulatory effects

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### Source

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### Aim of the study

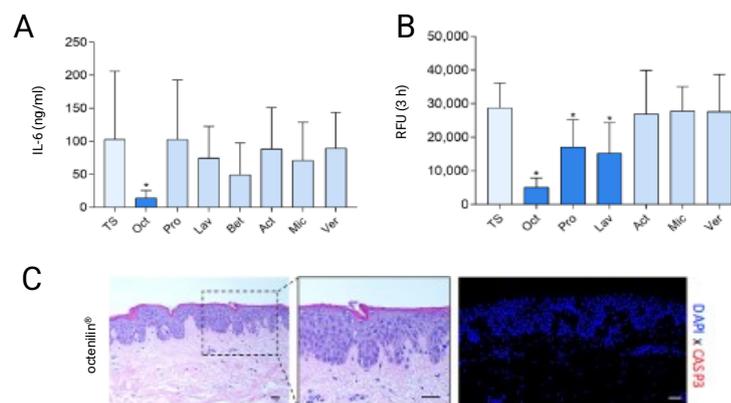
Moist wound care is widely accepted as standard therapy, but little is known about the mechanism of action of wound gels including antiseptic molecules or chlorine-based and chlorine-releasing agents, respectively. The aim of this study was the comparative assessment of commercially available hydrogels (octenilin®, Prontosan®, Lavanid®, Betadona®, ActiMaris®, Microdacyn<sub>60</sub>®, Veriforte™med) concerning their effects on the secretion of cytokines (IL-6, IL-8, IL -10), matrix-metalloproteinases (MMP) and their potential to cause alterations in skin structure and apoptosis.

### Methods

Human ex vivo skin was used unwounded or superficially wounded by tape-stripping and skin biopsies were treated with wound gels and cultured for 48 h. Supernatants were tested for selected cytokine and MMP concentrations (ELISA and enzyme activity assays). Sections of paraffin-embedded biopsies were stained with hematoxylin and eosin (H&E) as well as with an antibody against activated caspase-3 to examine skin architecture and apoptotic cells, respectively.

### Results

octenilin® wound gel demonstrated significant broader anti-inflammatory and protease-inhibitory capacities than other investigated hydrogels. octenilin® wound gel did neither alter skin morphology nor cause caspase-3 induced apoptosis of human epidermal cells.



A, B: (A) IL-6 concentration levels measured by ELISA and (B) activated MMP1, MMP2, MMP8, MMP9, MMP12, MMP14 (3 h activation) concentration levels analyzed by MMP enzyme activity assay in supernatants of 48 h cultured human tape-stripped (TS) skin biopsies topically treated with indicated wound gels as well as for a TS untreated control. C: Assessment of the skin structure with H&E staining and apoptosis with caspase-3 staining upon treatment with octenilin® wound gel.

### Conclusion

This study advances the mechanistic understanding of how hydrogels based on various antimicrobials impact immune responses in the process of wound healing. Totally different effects for several commercially available hydrogels were observed. octenilin® wound gel exhibited significantly superior anti-inflammatory and protease-inhibitory capacities, did not alter skin structure and preserved the viability of human epidermal cells. Thus, providing a safe option for wound dressings in clinical conditions, promoting wound healing.