

# The influence of Suprasorb P and Suprasorb C on proteases and their inhibitors in pressure sores

Piatkowski A.<sup>1</sup>, Ulrich D.<sup>1</sup>, Abel M.<sup>2</sup>, Pallua N.<sup>1</sup>

<sup>1</sup> [apiatkowski@ukaachen.de](mailto:apiatkowski@ukaachen.de)

<sup>1</sup> Department of Plastic Surgery, Hand Surgery – Burns Unit, RWTH Aachen University Hospital

<sup>2</sup> Lohmann & Rauscher GmbH & Co KG, D-56587 Rengsdorf

## Introduction:

Introduction: Chronic wounds are becoming a growing entity in wound management. Proteases like elastase and plasmin are of great importance in wound healing. Matrixmetalloproteinases (MMP) and their physiological inhibitors, the tissue inhibitors of metalloproteinases (TIMPs), play significant roles in wound repair, especially regarding chronic wounds, i.e. pressure sores. In this study, the concentration and expression of MMP-2, -9, and TIMP-1 and -2 and activity of gelatinase, plasmin and elastase were determined in wound fluid of patients with pressure sores.

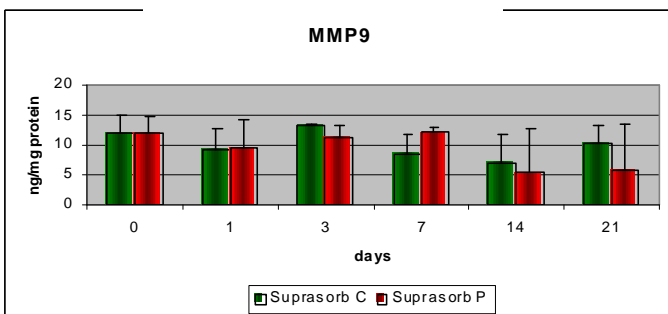
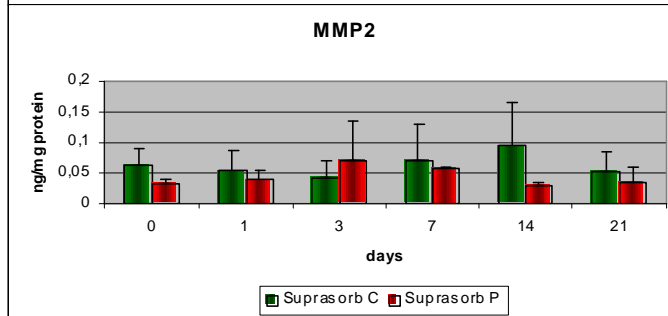
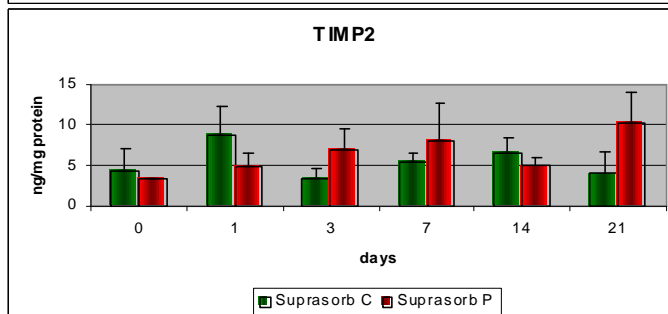
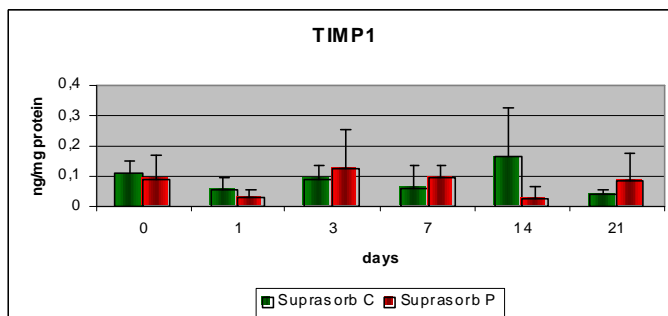
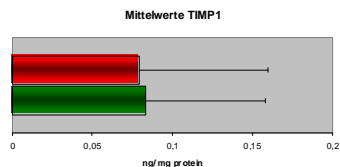
## Material and Methods

In order to determine the influence of Suprasorb C, a bovine collagen matrix, on wound healing two groups of patients with chronic wounds were set up. 5 patients received wound dressing using Suprasorb P, a PU foam dressing (Group A) whereas in 5 different patients wounds were dressed by the combination of Suprasorb P and Suprasorb C. Wound fluid was collected before treatment (day 0), and at day 3,7,14 and 21. Wound status and wound size were documented.

Wound fluid was collected by application of a non-adherent, absorbent wound dressing which was cut to fit and placed on the wound for 6 hours. The dressing was fixed by an occlusive foil. The wound dressing remained after removing from the wound at -80°C. The concentration of MMP-2, MMP-9, TIMP-1 and TIMP-2 was measured using ELISA-Kits (Oncogene Research Products, Boston, MA). Gelatinase-activity, elastase and plasmin were specified by an activity assay (Chemicon International).

## Results:

Both groups presented a positive wound healing in regular healing time. Group B demonstrated a significant effect concerning the concentration of MMP-2, -9, and TIMP-1 and -2. A significant difference was noticeable regarding gelatinase-activity. Group B showed a decreasing gelatinase activity over time compared to group A. These results support new achievements in wound therapy.



## Discussion:

Collagen based wound dressings have a positive effect on wound healing and healing time. The effect of Suprasorb C as wound dressing can be noted in gelatinase activity as well as in MMP-2 and MMP-9 wound fluid concentration. Although the influence is significant, the low number of patients enrolled in this study makes it difficult to ensure on which day of treatment the positive effect of Suprasorb C sets on.

Further studies will have to determine how long a wound should be treated with Suprasorb C in order to decrease MMP levels and to restore a physiological balance between MMP's and TIMP's.

