

Research Compact

Tags Octenisept, biofilm model, wound

Titel **Efficacy of octenisept in novel in vitro biofilm models based on blood**

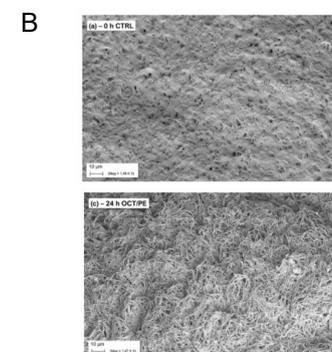
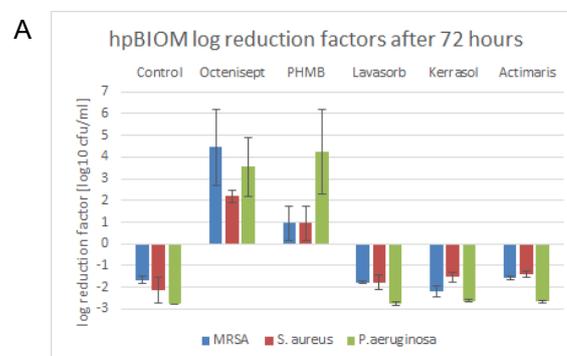
Authors Besser et al.; Rembe et al; Stürmer et al.
Arbeitsgruppe: Prof. Ewa Klara Stürmer, Department of Vascular Medicine, University Heart and Vascular Center Hamburg, Translational Wound Research, University Medical Centre Hamburg-Eppendorf, Hamburg, Germany, e.stuermer@uke.de

Source 1: 2020, Scientific Reports, <https://doi.org/10.1038/s41598-020-61728-2>
2: 2020, Frontiers in Microbiology, <https://doi.org/10.3389/fmicb.2020.564513>
3: 2020, Int. J. of Hygiene and Environmental Health, <https://doi.org/10.1016/j.ijheh.2021.113744>

Aim of the study Modern wound antiseptics have to prove their antibacterial efficacy in the quantitative suspension test according to EN 13727. However, this method does not reflect the human environment sufficiently, as the majority of chronic wounds are colonized with bacterial biofilms. Therefore, the working group of Prof. Dr. Stürmer established novel biofilm models based on blood components. Three recently published studies show results of different antiseptics exposed to these models

Methods Three models were established:
hpBIOM: A model based on buffy coat of human donors; ihBIOM: A leucocyte depleted model based on human fresh frozen plasma. sbBIOM: Based on sheep blood, similar to hpBIOM. These models were inoculated with either *P. aeruginosa*, *S. aureus* or MRSA and matured for 12 to 24 hours, following exposure to octenisept, Lavasorb (0.04% PHMB) and different hypochlorous acid irrigation solutions.

Results All products containing hypochlorous acids failed to diminish the biofilm in all tested novel biofilm models under all tested conditions^{1,2,3}. They even failed to kill the bacteria in the quantitative suspension assay controls². However, octenisept and PHMB were able to eradicate the biofilm in the hpBIOM model in 48 to 72 hours after application. In case of a MRSA inoculated biofilm octenisept showed superior efficacy compared to PHMB². Moreover, octenisept showed a comparably high efficacy in ihBIOM and sbBIOM models³. Scanning electron microscope images show that the treatment with octenisept induces a transition in biofilm surface texture from smooth to rough 72 h after application³.



A: log reduction factors in hpBIOM inoculated with either MRSA, *S. aureus* or *P. aeruginosa* 72 h after exposure to different antiseptics. Negative values represent an increase in bacterial counts. B: scanning electron microscope images before (top) and after exposure to octenisept (bottom).

Conclusion **Octenisept showed superior efficacy in all three novel biofilm models mimicking the environment of chronic wound biofilms. In contrast wound irrigation solutions based on hypochlorous acids showed no efficacy.**