Biofilm

Treatment with Dermacyn (SOS) resulted in reduced viability of biofilm cells. In addition, it **affected the overall three-dimensional architecture**, evident by the **decrease in the overall biomass** attached to the surface. Continued treatment resulted in an increase in non-viable cells and a further decrease in biomass.

In order to further determine the extent of reduction of the biofilm biomass; a quantitative analysis of biofilm architecture was carried out. Over the course of treatment the average biomass has decreased significantly. Furthermore, average thickness of the biofilm and roughness (a measure of biofilm heterogeneity) was affected and reduced.

The visual and quantitative evaluation of SOS treatment effect on biofilm architecture suggested that the efficacy of SOS against biofilms may be based on both killing of the biofilm cells and disaggregating of cells from the biofilm. Further investigation whether SOS treatment resulted in biofilm disaggregation was carried out.

Biofilm disaggregation was examined by monitoring the biofilm and showed that SOS indeed induced disaggregation of biofilms. To further determine whether SOS treatment resulted in disaggregation of biofilm -cells as individual planktonic cells or in sloughing of biofilms (removal of cell clusters)- the effluent of biofilms was analyzed by microscopy. The visual inspection of biofilm effluents revealed the presence of both, planktonic cells and cell clusters/aggregates independent of treatment of biofilms. Further investigation whether SOS treatment resulted in an increased disaggregation of cell clusters was carried out. (An “aggregate” composed of more than 3 bacterial cells was considered to be a cell cluster). The total number of clusters present in 20 different microscopic fields of view per effluent, as well as the dimension of each cell cluster was noted. Results showed that the SOS average number of cell cluster in the effluent of SOS-treated biofilms had indeed reduced significantly.

**Dermacyn's mode of action** is a function of the antimicrobial properties of hypochlorous acid (HOCl) and its salt, hypochlorite (OCl⁻). These ancillary medicinal substances assist in the removal of microorganisms as these potent oxidants HOCl and OCl⁻ eradicate microorganisms by readily reacting with their **proteins** and **lipids**.