Assessment of superabsorbent dressings' activity on biofilm using a novel 3D soft tissue based method

Aim: to **qualitatively and quantitatively** assess the activity of superabsorbent dressings on biofilm in comparison to one absorbent and one superabsorbent wound dressing claiming hydrophobic antibacterial activity, using a novel *in vivo* like method.

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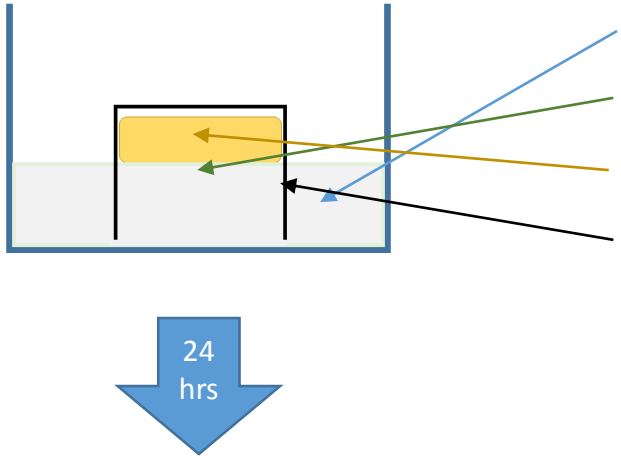
Method

- Clinically relevant, since the use of soft tissue allows biofilm formation that closely resembles the biofilm identified in hard to heal wounds.
- Both qualitative and quantitative for rapid screening and numerical values



1. Synthetic soft tissue
2. *Pseudomonas aeruginosa* (PAO1)
3. Dressing
4. Insert

Assessment

- Zone of inhibition (ZOI)
- Bacterial burden in dressings and SST

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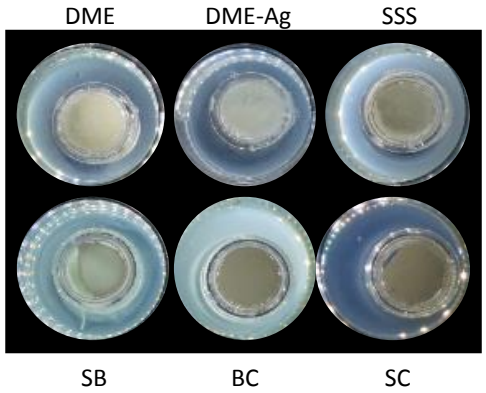
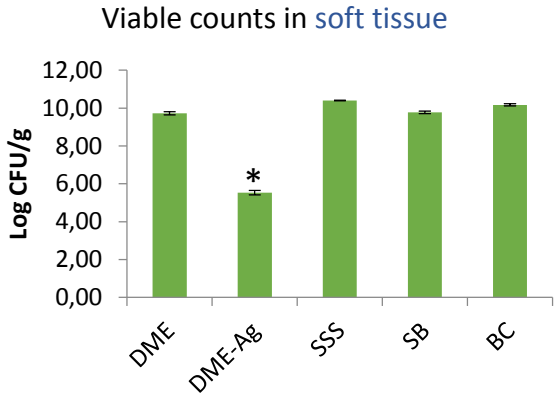
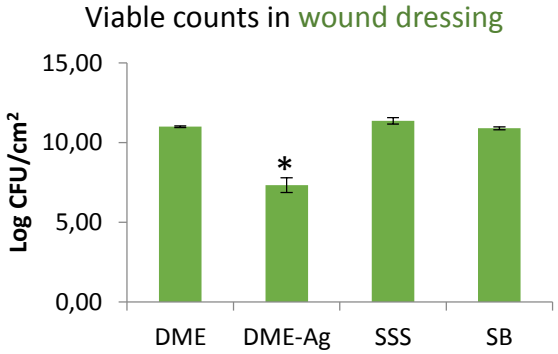
Results

- DME with a silver net (DME-Ag) showed a distinct ZOI and no onset of Pyocyanin (green pigment and virulence factor).
- DME showed partial ZOI and partial onset of Pyocyanin.
- SSS (benchmark 1) was equivalent to DME but more green.
- SB (benchmark 2) showed partial ZOI and onset of Pyocyanin equivalent with bacterial biofilm control.
- The bacterial burden in the tissue and in respective dressings was equal for all, except for DME-Ag resulting in a log 4 reduction.







DME = DryMax® Extra, DME-Ag = with silver net, SSS* = Sorbion Sachet S, SB* = Sorbact®, BC = bacterial control, SC = sterility control
*= benchmark product

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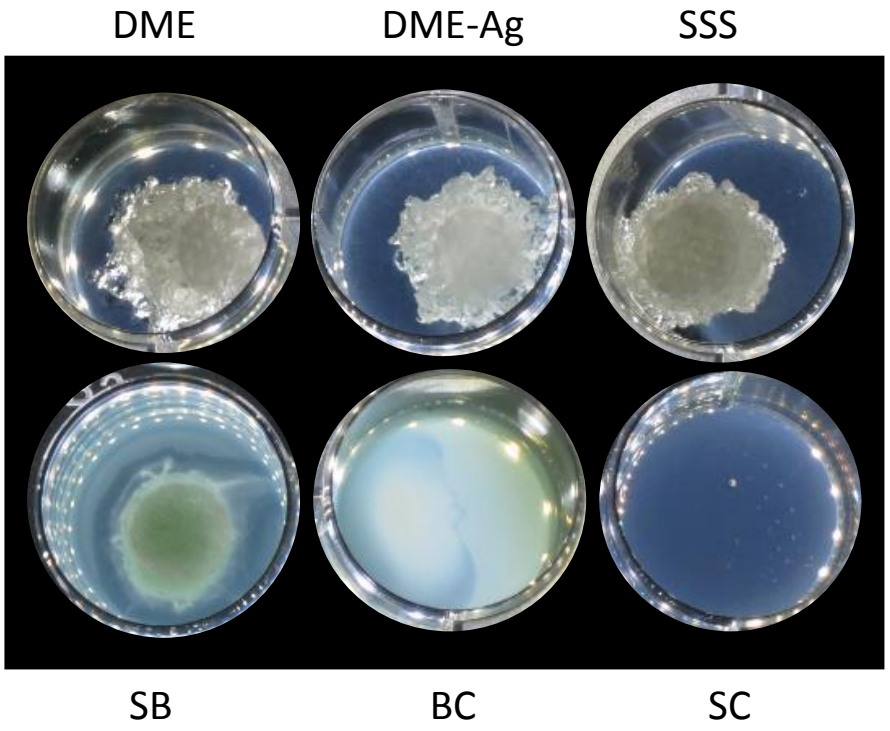
Results

- Complete ZOI was seen for all SAP dressings (DME, DME-Ag, SSS) **without** inserts
- No ZOI was seen for SB



DME = DryMax® Extra, DME-Ag = with silver net, SSS* = Sorbion Sachet S, SB* = Sorbact®, BC = bacterial control, SC = sterility control
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Conclusion

- DryMax® Extra, a superabsorbent dressing, removes bacteria from synthetic soft tissue equally well as Sorbact® and Sorbion Sachet S that claim antibacterial activity.
- To obtain log reduction in bacterial load an antimicrobial substance must be added.
- DryMax® Extra showed partial **ZOI** and less green color than Sorbion Sachet S while Sorbact® was very green and equal to the bacterial biofilm control.
- The Green color most likely correlates to the virulence factor Pyocyanin of *Pseudomonas aeruginosa*. Pyocyanin has been reported to play an essential role for formation of biofilm and other virulence factors.
- DryMax® Extra possibly offers a New strategy for wound therapy By targeting the virulence factor Pyocyanin, thus rendering the pathogens unarmed with less risk of infection and development of antibiotic resistance.

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