

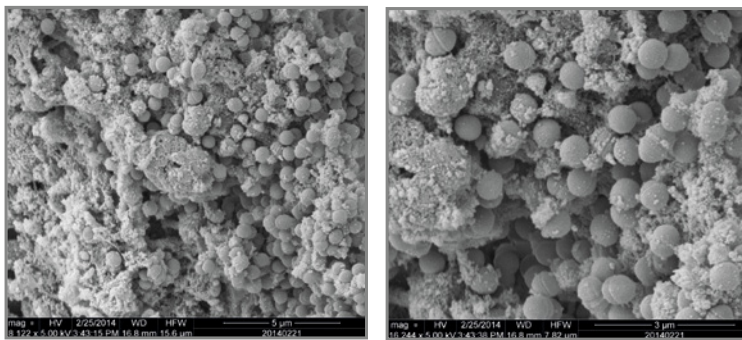
Why is wound biofilm so resistant? How can a dressing destroy it?

It is well documented that the vast majority of hard-to-heal wounds with localised chronic infections are predominantly driven by biofilm ⁽¹⁾. Once established, complex biofilm communities frequently become highly tolerant to standard treatment protocols, including antibiotics, and biofilm is known to be detrimental to wound healing ⁽²⁾.

Dr Matthew Malone is an expert in biofilm and was a member of the Global Wound Biofilm Expert Panel ⁽³⁾. Convened in 2017, the panel generated an important consensus document to clarify misunderstandings about the role of biofilms in clinical practice and provide a basis for clinicians to recognise biofilms in chronic nonhealing wounds with a view to optimising patient care ⁽³⁾. So, who better than Dr Malone to describe the best ways to tackle biofilm, and to explain how the properties of Aquacel Ag+ Extra™ position this dressing to disrupt and reduce biofilm, thus removing a barrier that can impede wound healing?

Dr Malone explains that a multi-faceted approach is needed to battle biofilms as they are extremely tolerant, and at the core of this is the physical removal. Much like you brush your teeth to prevent accumulation of biofilm, mechanical removal using sharp debridement with a scalpel will physically remove biofilm. However, Dr Malone points out, 'it's not that simple, there is no magic bullet. You can't see biofilm with naked eye observations and microorganisms are not uniformly distributed over a wound surface. This means that clinicians may leave behind areas of biofilm despite debriding a wound, therefore other approaches are needed too.

Certainly, a wound needs a good standard of care including wound bed preparation and debridement (where indicated). This may also include the appropriate use of topical antiseptics to 'mop up' any microbes that you may have missed through mechanical or physical debridement'.



Biofilm as seen under a microscope

“You can't see biofilm, so you are likely to miss pockets, therefore other approaches are needed too”.

So, it seems that topical wound cleansers and antiseptics-antimicrobials maybe beneficial in tandem with mechanical removal of biofilm. Aquacel Ag+ Extra™ dressing contains an antimicrobial (ionic silver) and two agents, a surfactant and a metal chelating agent. Working together, these two agents lift and disrupt the extracellular polymeric substance or EPS. This is the component of biofilm which coats and protects the microbes. This EPS is one reason why biofilms are so hard to eradicate. Disruption of EPS by the surfactant and metal chelating agent paves the way for the antimicrobial silver to infiltrate to effectively target the microorganisms within a biofilm community.

“Put simply, surfactants ‘soften and break things up’. Metal chelating agents make bacteria more permeable, and augment antibiotic activity by facilitating entry into a target cell.”

What is a surfactant and why would you put one in a dressing?

Surfactants are used extensively to remove dirt. Simply put, surfactants ‘soften and break things up’. They achieve this by increasing the wettability of a wound and the solubility of materials within it. Their role in dressings is to enhance the sequestration or trapping and removal of ‘dirt’ and non-viable tissue, soluble proteins, and block adhesion of biofilm to the wound bed.

...Aquacel Ag+ Extra™ also contains a metal chelating agent EDTA.

What is a chelating agent and what is its function in a dressing?

Ethylenediaminetetraacetic acid (EDTA) make bacteria more permeable, and augments antibiotic activity by facilitating entry into a target cell. EDTA also disrupts biofilm through its action of binding to metal ions such as calcium and iron. These metals are key components of the EPS, that makes biofilm so hard to remove.

EDTA works in combination with the Benzethonium chloride (BEC), the surfactant in Aquacel Ag+ Extra™. In short, these two agents work together to ‘open up’ the EPS so that the silver is not wasted and is able to get to its microbial targets. This combination therapy is quite unique in a wound dressing, and importantly it can keep working for up to seven days. Have you tried MORE THAN SILVER?

References:

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3. Schultz G, Bjarnsholt T, James GA, Leaper DJ, McBain AJ, Malone M, Stoodley P, Swanson T, Tachi M, Wolcott RD, Global Wound Biofilm Expert Panel. Consensus guidelines for the identification and treatment of biofilms in chronic nonhealing wounds. *Wound Repair and Regeneration*. 2017 Sep;25(5):744-57. SC-58589-AUS-ENG-v1 (v1.0)