TABLE 5: BACTERIAL BIOFILMS (BBF) AND SILVER: SOME FACTS AND SPECULATIONS by Whitehouse, M.

Facts:

i) Silver-impregnated surfaces defy bacterial colonisation.
ii) BBF contain a range of micro-organisms, requiring a broad-spectrum microbicide.
iii) Most antibiotics mainly control replicating bacteria. But 'hibernating' bacteria lodged in BBF may still be Ag-susceptible.
iv) BBF present 'sticky' substrates for Ag^0 attachment, as NPS.
v) BBF contain many potential argentophilic 'docking' sites for Ag(I) including:
- Extracellular polymeric substances (EPS)
- Exocellular DNA
- Anionic glycans, glycolipids
- Proteins from host (fibrin, etc) and colonising bacteria
- Esterified unsaturated fatty acids in phospholipids etc

Speculations:

a) Ag(I) might disrupt 'quorum sensing' (QS), a survival mechanism involving intercellular signalling within/between bacterial colonies, mediated by thiolactones sourced from cysteine eg:
b) Another QS molecule = pyocyanine (aphenazine), a virulence factor in Ps.*aeruginosa*) (Lau et al 2004), might be a target for silver deactivation.
c) Silver pharmaceuticals may augment the action of cationic agents used for wound debridement eg polihexanide.
d) Crafted Ag(I)complexes and appropriate delivery systems may confine/potentiate disinfection – and stimulate local healing (Becker 1985) - of wounds, ulcers and other localised targets.

Additional references:

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