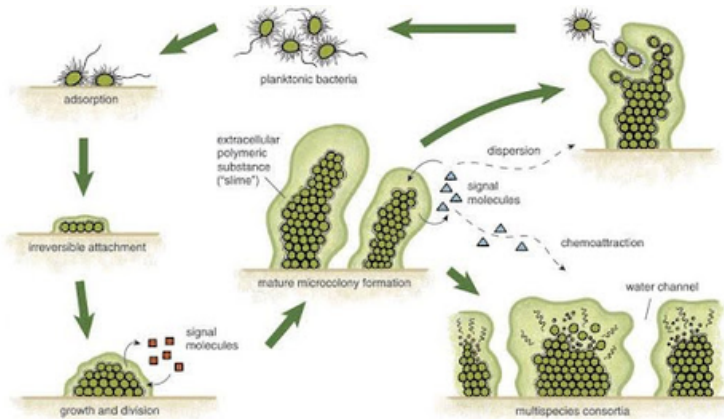


WHAT ARE BIOFILMS?

Biofilms are a thin but robust layer of glue-like film adhering to a solid surface and containing a community of bacteria and other microorganisms within it. They often have a greasy texture, and are found on all kinds of surfaces.

Biofilms can spread easily and grow on implanted medical devices such as prosthetic heart valves, joint prosthetics, catheters, pacemakers, walking frames, hoists, hospital bed frames etc. This in turn leads to infections and illness through contact with the skin.

Biofilms are difficult to remove, even with disinfectants and often require advanced cleaning methods.



Growth and development of biofilms



Biofilm under a microscope

Below is an extract from a research paper, published on <https://www.ncbi.nlm.nih.gov/pmc/articles>

“Biofilms can be found on a variety of medical devices, such as catheters, implants, and prosthetics, leading to device-related infections. Biofilms can act as reservoirs for pathogenic microorganisms, allowing them to evade the body’s immune system and resist the effects of antibiotics and sanitizers. Consequently, biofilm-related infections are notoriously difficult to treat and can lead to severe complications, prolonged hospital stays, and increased healthcare costs.

Biofilms found on medical devices can consist of Gram-positive or Gram-negative bacteria or yeasts. Commonly isolated bacteria from these devices include Enterococcus faecalis, Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus viridans, Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis, and Pseudomonas aeruginosa.

These organisms can originate from the skin of patients or healthcare workers, tap water that the device’s entry ports are exposed to, or other environmental sources. Depending on the device and how long it has been used in a patient, biofilms can be composed of a single or multiple species. In the case of urinary catheters, biofilms may start with a single species but eventually become multispecies biofilms with prolonged exposure, according to the CDC.

The prevalence of biofilm-related infections from medical devices has become a significant clinical concern. Because biofilms are known to be highly resilient and resistant to antimicrobial treatment and traditional antimicrobial strategies, understanding the mechanisms by which biofilms form and thrive has become a focal point for many researchers. This knowledge is crucial for developing strategies to prevent and treat biofilm-related infections. Scientists have identified several key factors that contribute to biofilm formation, including surface characteristics of medical devices, the presence of organic materials, and the ability of microorganisms to communicate and cooperate within the biofilm structure.”

Excerpt from: ‘Bacterial biofilm formation on implantable devices and approaches to its treatment and prevention.’
Zohra Khatoon, Christopher D. McTiernan, Erik J. Suuronen, Thien-Fah Mah, and Emilio I. Alarcon. Dec 4, 2018