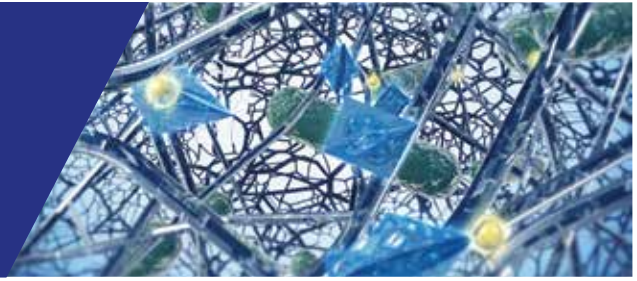


# What is a Biofilm?

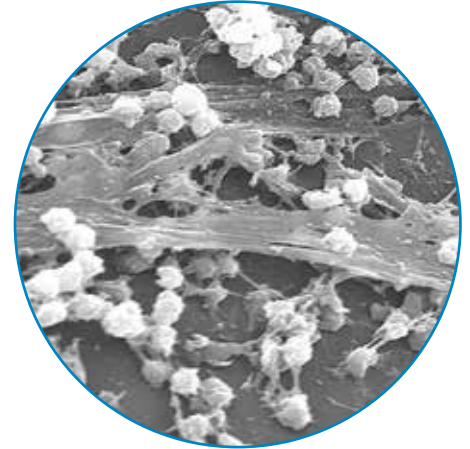


## Biofilms

We encounter biofilms often in everyday life. The plaque on our teeth, the film inside a water tank, the colorful mats in hot springs, and the blue veins in certain cheeses are all examples of biofilms. Some are harmful, some are neutral, and some are even beneficial to our daily lives.<sup>1</sup>

## Types of Bacteria

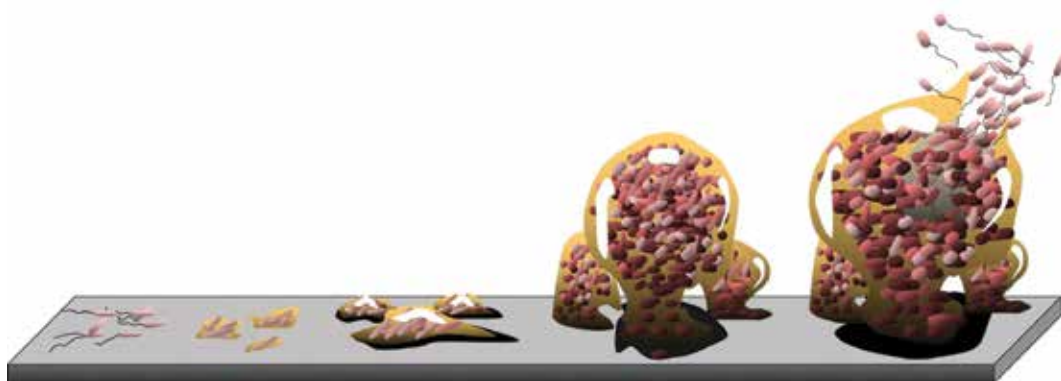
Bacteria generally live in two different forms: free-floating 'planktonic' or adhered to a surface. The planktonic form typically causes acute disease as the bacteria rapidly multiply, consuming resources, triggering immune responses, and generating toxins that harm the host.<sup>2</sup>



When enough planktonic bacteria attach to a surface, whether it be the surface of a wound, an implant, or a body cavity, a phenomenon called quorum sensing triggers a change in behavior. Cell multiplication slows, and the bacteria begin to produce Extracellular Polymeric Substance—a dense cross-linked mucous of polysaccharides, proteins, lipids, nucleic acids, and salts. This EPS forms a protective barrier that blocks antimicrobial molecules (such as antibiotics), and can be very difficult to remove without vigorous mechanical action.<sup>2</sup>

## The Importance of Eliminating Biofilms

A patient with a bacterial infection may take antibiotics and resolve their symptoms, but they may have only eliminated the planktonic bacteria. In time, cells will migrate out of the biofilm and cause a new infection. Elimination of the biofilm is essential to long-term resolution of the problem.<sup>3</sup>



References:

1. <http://www.wbur.org/commonhealth/2017/10/13/beauty-of-bacteria>
2. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2732559/pdf/02-0063\\_FinalP.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2732559/pdf/02-0063_FinalP.pdf)
3. <https://onlinelibrary.wiley.com/doi/abs/10.1111/apm.12099>

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