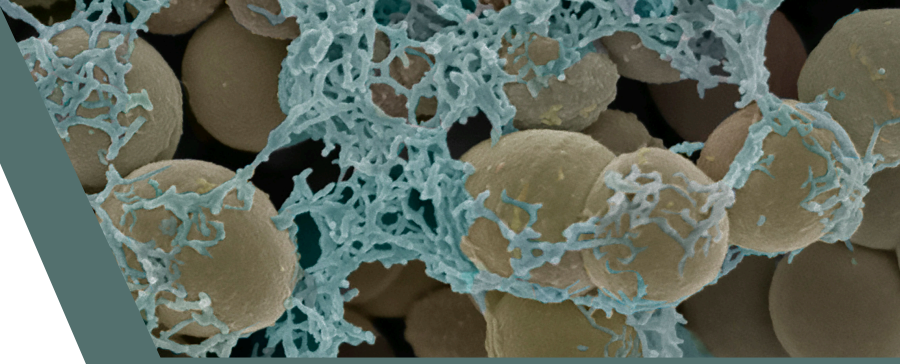



BIOFILM BASICS



What Is Biofilm?


Biofilm is a highly organized community of microorganisms (mostly bacteria) that forms on surfaces within the mouth, including teeth, gums, implants, restorations, and appliances. These bacteria are embedded in a sticky, protective layer known as the **EPS (Extracellular Polymeric Substance) matrix**. This matrix is made up of sugars, proteins, lipids, and extracellular DNA, which the bacteria produce to anchor themselves and **protect their colony from external threats like antimicrobials and the host immune system**.


 **Takeaway:** Biofilm isn't soft plaque—it's a resilient, structured system that must be regularly broken up to control disease.

 **Patient-friendly phrase:** "Biofilm is like a shielded bacterial colony that brushing alone may not reach."

How Biofilm Forms:


- **Pellicle** Formation: The initial thin protein layer from saliva (acquired pellicle) forms on clean oral surfaces within **minutes**.
- Bacterial Attachment: Early colonizing bacteria attach to the pellicle.
- EPS Matrix Production: Bacteria begin to multiply and produce the sticky EPS matrix.
- Biofilm Maturation: Additional bacteria join, including more pathogenic species. The community develops complex structures and channels. This becomes **1000x more difficult to remove**.
- **Evolves into a more pathogenic community over time**
- Inflammation Triggered: As biofilm matures, it becomes more pathogenic and triggers an inflammatory response in the host.

 **Takeaway:** Biofilm is dynamic. The longer it's left undisturbed, the more dangerous it becomes.

 **Patient-friendly phrase:** "Every day biofilm grows stronger so we have to use different tools at home to not just break it up, but also kill what is living inside it."

Why It Matters:

Uncontrolled biofilm is the underlying cause of caries, gingivitis, and periodontal disease, and is linked to systemic inflammation. Left untreated, it recolonizes rapidly—even after professional cleaning.

 **Takeaway:** Biofilm control is disease prevention. You're not just cleaning teeth—you're protecting whole-body health.

 **Patient-friendly phrase:** "Regularly removing biofilm helps prevent cavities, bleeding gums, and even protects your overall health."

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