

Biofilm-Disrupting Enzymes:

New potentiators for antimicrobials

Approximately 65-80% of all bacterial and fungal infections in humans are biofilm-related. Biofilms are highly resistant to antimicrobial agents, disinfectants and immune defenses. GlycoNet researchers have developed novel glycoside hydrolase enzymes that can both degrade biofilms and prevent the formation for a range of bacterial and fungal pathogens, while keeping host microbiota intact. The enzymes could be formulated for diverse applications such as antimicrobial agents, device coatings, medical disinfectants and topical wound treatment.

Key Benefits

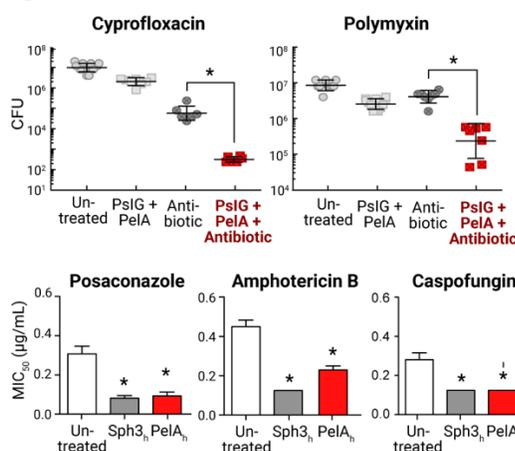
- Range of target pathogens
- Quick action (< 1 hour to disintegrate biofilm)
- Stable formulation (up to 8 days)

Global Impact & Market

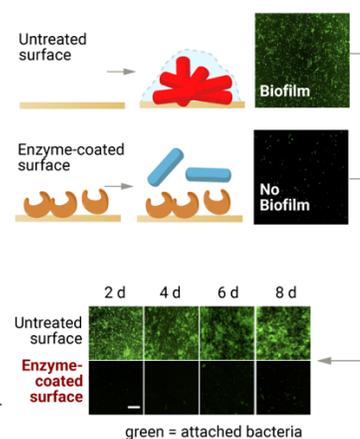
The biofilms treatment market is projected to reach \$2.4 billion by 2025. The rapid growth is driven by the rising prevalence of chronic, surgical, and traumatic wounds caused by biofilm-embedded microorganisms. Biofilms can form on biotic (e.g. lung epithelia cells, organs) and abiotic (e.g. medical device) surfaces.

One major clinical unmet need afflicts immunocompromised populations, who are prone to contract bacterial- and fungal-related pulmonary infections. Once contracted, the success rate of antimicrobial therapy is significantly reduced. When all treatments fail, infections eventually lead to respiratory failure and death. As an example, the mortality associated with community-acquired pneumonia, the most common cause of acute lung infection in immunocompromised patients, is nearly 50% in ICU patients requiring vasopressors.

1 Treating bacterial and fungal infections



2 Preventing biofilm formation



The Technology

- 1 Disruption of biofilms in bacterial and fungal infections:** Enzymes can rapidly potentiate the effect of existing antimicrobial agents to disperse biofilm at wound and infection sites in less than an hour. In addition, the high specificity of the enzymes eliminates off-target effects, including the disruption of host cells and microbiota.
- 2 Prevention of biofilm formation:** Enzymes can be coated onto surfaces of catheters and prevent bacteria from attaching to the surface for 8 days.

Application

The novel microbial biofilm disruptors target infections caused by species including but not limited to: *Pseudomonas spp.*, *Escherichia coli*, *Staphylococcus spp.*, *Aspergillus fumigatus*, and *Acinetobacter baumannii*. Combined with the stability of the enzymes and their simple production method, the technology can be applied to treat pulmonary infections, heal wounds and burns, eliminate infections, and disinfect medical devices.

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