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Model biofilms of Staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas fluorescens, and Pseudomonas aeruginosa were made on steel and polypropylene substrata. Plaque-resembling biofilms of Streptococcus mutans, Actinomyces, viscosus, and Fusobacterium nucleatum were made on saliva-coated hydroxyapatite. The activity of enzymes against bacterial cells in biofilm was measured by fluorescence microscopy and an indirect conductance test in which evolution of carbon dioxide was measured. Glucose oxidase combined with lactoperoxidase was bactericidal against biofilm bacteria but did not remove the biofilm from the substrata. A complex mixture of polysaccharide-hydrolyzing enzymes was able to remove bacterial biofilm from steel and polypropylene substrata but did not have a significant bactericidal activity. Combining oxidoreductases with polysaccharide-hydrolyzing enzymes resulted in bactericidal activity as well as removal of the biofilm.

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