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Oral biofilms and recombinant dextranase

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Biofilms are formed by the mutual adhesion of planktonic microbes through the production of extracellular polysaccharide matrix complexes. Bacterial biofilms are abundant and can be found in a variety of places, including the human oral cavity, which has been the main site of entrance for microorganisms. Microorganisms colonise or spread to adjacent epithelial surfaces after being delivered orally through air and food. The external region of the mucus layer on the tongue, gingiva, cheek, and palate, as well as the hard surfaces of teeth or dentures, are two distinct sites for microbial colonisation in the oral cavity. Dental caries and periodontitis are the two most frequent illnesses in humans that are caused by oral biofilms. Therefore, it is important to remove mouth bacteria regularly, either mechanically by tongue and cheek movement, epithelial cell shedding or by tooth brushing. This helps in avoiding several oral diseases.

Further, dextran, a component of dental decay microorganisms, forms the dental plaques and biofilms in the oral cavities. Therefore, the degradation of dextran paves the way to control oral biofilms. Dextranase is an enzyme that is used to degrade dextran. The Talaromyces species is capable of producing dextranase at an industrial level. Through recombinant engineering, modified Escherichia coli can produce high levels of these enzymes. The industrial production of the dextranase enzyme, the formation of oral biofilms can be prevented, thereby avoiding the cause of several oral infections.

Keywords: Oral biofilm, Dextran, Dental caries, Dextranase, Talaromyces species, Recombinant Escherichia coli

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