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Importance of microbiome study to treat dandruff

Sreenithaa MV

Exopolysaccharides are the natural polymers produced by microorganisms under stressed conditions. The exopolysaccharides set up the functional and structural integrity of biofilms and fundamental components that determine the physio-chemical properties of a biofilm. Many exopolysaccharide producing bacteria are being isolated and exploited for their applications in bioremediation, cosmetics, food and pharmaceutical industries. Oil spills have also been eradicated by using bacterial exopolysaccharides. Many bacteria from household wastes, soils, sugar beets, foods, dairy wastes, sea, sewage, faeces, etc., have been isolated and characterised for their exopolysaccharide production. But bacteria present in the human scalp have not yet been characterised for their exopolysaccharide production. Dandruff is the major cause of hair fall and other hair related problems. Though there are many anti-dandruff shampoos and products available in the market, people still suffer from dandruff. There is no permanent cure for dandruff unless specialised treatments are given. Few studies revealed that some of the major causes for dandruff are the Staphylococcus sp., Propionibacterium sp. along Malassezia fungal colonies which predominantly live on the human scalp. Recent studies found that the presence of dandruff is high due to Staphylococcus bacteria. Many anti-dandruff shampoos contain zinc pyrithione which kills the fungus as well as Staphylococcus bacteria which cause dandruff. But the microbes arise again causing dandruff. Thus, if the exopolysaccharide producing Staphylococcus strain present on the human scalp with dandruff is isolated and characterised, properties of the exopolysaccharide produced by the bacteria will be known. Their interaction with other microbial communities can also be investigated. This will lead to novel hair care products by giving insights for degrading the biofilm produced by this strain. This idea of utilising exopolysaccharides to design drugs can be implemented by cosmetic and pharmaceutical industries to produce anti-dandruff products which might give a permanent cure to dandruff.

Keywords: Exopolysaccharides, Bacteria, Staphylococcus, Dandruff, Biofilm, Human scalp

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