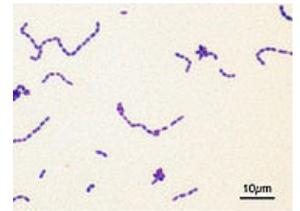


Streptococcus mutans

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Streptococcus mutans is G +, an facultative anaerobic bacterium that usually lives in the human oral cavity. It is very often involved in the development of tooth decay. It uses dextrans, which are formed by the cleavage of polysaccharides in the oral cavity, to adhere to the tooth surface.

It was first described by Clark in 1924.



Streptococcus_mutans_Grar

Streptococcus mutans in relation to dental plaque

Bacteria from the group of Streptococcus mutans (*S. mutans* and *S. sobrinus* are most often isolated from carious lesions) can only form colonies on a solid non-desquamating surface. Therefore, their colonies do not appear in the mouth until the first temporary tooth has been cut. Until then, they can only occur in the mouth as transient flora, with the exception of children with a cleft palate, which makes the obturator.

The virulence of these bacteria is conditioned by the products of their metabolism. By fermenting sugars, it creates organic acids (acetic, formic, propionic, butyric or lactic), which reduce the pH in the oral cavity from 6.5 to values below 5.5. This leads to demineralization of hard dental tissues. The formation of acids takes place even in the absence of fermentable carbohydrates in the plaque. This is because *S. mutans* synthesize intracellular polysaccharides that allow continuous acid production during periods of exogenous substrate deficiency.

Another factor in the virulence of cariogenic streptococci is the water-insoluble extracellular polysaccharides they synthesize from sucrose. These allow irreversible adhesion of these bacteria to the smooth tooth surface and its colonization, increase plaque volume, allow increased sugar diffusion and acid production in the deeper plaque layers, and inhibit the activity of salivary antimicrobial agents. The enzyme glucosyltransferase (GTF) plays an important role in the synthesis of extracellular polysaccharides. Loss of the GTF gene significantly reduces the virulence of cariogenic streptococci.

Prevention options

The development of a safe vaccine against *S. mutans* has come a long way in the last two decades. The surface fibrillar proteins of these streptococci are most often used for active immunization, which allow microbes to adhere to the salivary pellicle and the GTF enzyme. The mechanisms of passive immunization and the possibilities of using monoclonal IgG antibodies were also studied. One of the reasons why caries vaccination is not yet performed is that active immunization induces the production of antibodies that can cross-react with human tissues.

The transmission of bacteria from the *S. mutans* group takes place in early childhood, most often by close contact between mother and child. Therefore, one of the important preventive measures is to provide the future mother with adequate dental care and try to reduce the amount of *S. mutans*, eg with antimicrobial substances.

Links

related articles

- **Streptococcal infections:** Group A streptococcal infection • Scarlet fever • Sleep angina • Erysipel • Impetigo • Infections caused by virulent streptococci • Complications and treatment of streptococcal infections • Rheumatic fever
- Dental caries

References

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