

Agents of respiratory infections

Genus Haemophilus

The genus *Haemophilus* belonging to the family Pasteurellaceae was first observed by Robert Koch. These are tiny, immobile, non-sporulating gram-negative sticks. It occurs mainly on the mucous membranes, especially in the nasopharynx. The most important pathogen of this genus is *Haemophilus influenzae*. Other pathogens of this genus are: *Haemophilus aegyptius*, *Haemophilus ducrei*, *Haemophilus parainfluenzae*, *Haemophilus haemolyticus*.

Haemophilus influenzae

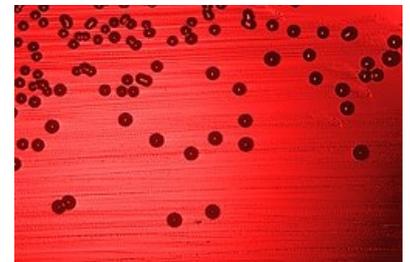
This bacterium is transmitted by droplet infection. The disease develops only in patients with damaged mucous membranes by other viral diseases. Adhesins and bacterial pili are important factors for mucosal colonization. Sheath formation is considered to be a major virulence factor. Encapsulated types are divided into six serotypes: a - f. The sheath allows the human immune system to resist, thus increasing the invasiveness of the microbe and its ability to survive in the body. Caps with type b antigen are the most effective.^[1] This type b colonizes the airways and causes severe invasive infections, it can also cause bacteremia, meningitis, septic arthritis and pericarditis. Vaccinations are against this type.

 For more information see *Haemophilus influenzae*.

Genus Staphylococcus

Luis Paster was the first to observe this genus in 1880. They are gram-positive cocci most often arranged in clusters in the shape of grapes. They are immobile and do not form spores or shells. This genus includes pathogens: *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus haemolyticus* and many others.

 For more information see *Rod Staphylococcus*.



Haemophilus influenzae)

Staphylococcus aureus

This bacterium lives on about a third of people on the surface of the skin and does not cause any problems, but just a little damage or a disorder of natural resistance and it manifests itself as a pathogen. It penetrates the tissues and causes purulent inflammation of the organs, even fatal sepsis. This *Staphylococcus* is relatively resistant and resists drying out and heating to 60 ° C. The virulence factors of this bacterium are surface peptidoglycan, protein A, protein A, capsular antigen, adherence proteins, it also has extracellular enzymes that damage tissues such as catalase, lipase, coagulase, nuclease. Other virulence factors are toxins such as alpha-, beta-, gamma-, delta-hemolysin, enterotoxin and leukocidin.

Staphylococcus aureus causes inflammation of the nasopharynx, larynx and trachea, it can also cause bronchopneumonia. *Staphylococcus aureus* is also known as MRSA, which is methicillin-resistant *Staphylococcus aureus*, which is resistant to methicillin and oxacillin, as well as other antibiotics such as tetracycline and chloramphenicol. MRSA is common in our large hospitals and is one of the causes of nosocomial infections. In 2002, a strain was discovered that was also currently resistant to vancomycin. It could become such a resistant strain that the infections it caused would have nothing to cure.^[1]

Genus Streptococcus

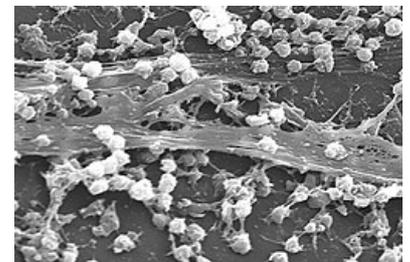
Streptococci are facultatively anaerobic gram-positive catalase-negative cocci that form pairs or chains. Streptococci are divided into alpha, beta and gamma according to hemolysis.

Alpha hemolysis or viridation, which is a change in the blood pigment to green verdoglobin. These streptococci include, for example *Streptococcus pneumoniae*, *Streptococcus anginosus*, *Streptococcus suis*, and also virulent oral streptococci (*Streptococcus mutans*) which form a common microflora.

Beta-hemolytic streptococci are pyogenic and are significant in medicine, because most of the pathogenic streptococci belong to this group. This group includes *Streptococcus pyogenes*, *Streptococcus agalactiae*.

Streptococcus pyogenes

Streptococcus pyogenes is one of the most pathogenic species of the genus *Streptococcus*. Its main virulence factor is protein M, which is anti-phagocytic and adherent. Another important factor is the hyaluronic acid capsule as well as the extracellular virulence factors known as hemolysins. This group includes streptolysin O, which is toxic



Staphylococcus aureus

to leukocytes and monocytes. Antibodies to this hemolysin are used to diagnose a recent streptococcal infection and to diagnose their possible late effects. *Streptococcus pyogenes* causes tonsillitis, purulent respiratory infections, sepsis and streptococcal toxic shock syndrome.

 For more information see *Streptococcus pyogenes*.

Links

Related articles

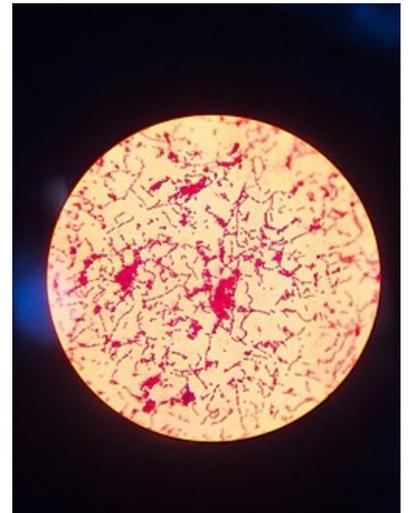
- *Streptococcus mutans*
- *Streptococcus pyogenes*)
- *Streptococcus agalactiae*
- Genus *Staphylococcus*

References

1. VOTAVA, Miroslav, et al. *Lékařská mikrobiologie speciální*. 1. edition. Brno : Neptun, 2003. vol. 495. ISBN 80-902896-6-5.

Used literature

- VOTAVA, Miroslav. *Lékařská mikrobiologie obecná*. 2. edition. Brno : Neptun, 2005. ISBN 80-86850-00-5.



Staphylococcus pyogenes