

Staphylococci

The Staphylococcus is a genus of [Gram-positive bacteria](#). Under the [microscope](#), they appear round ([cocci](#)), and form in [grape](#)-like clusters; they grow on many types of media. Produce pigment that varies from white to deep yellow. The *Staphylococcus* [genus](#) includes at least 40 species. Most are harmless and found normally on the [skin](#) and mucous membranes of humans and other organisms. Other cause suppuration, abscess, pyogenic infection and even fatal septicemia. The three main spp. of clinical importance are: *Staphylococcus aureus*, *Staph. epidermidis* and *Staph. Saprophyticus*.

Staph.aureus is a major pathogen , it is coagulase positive, which differentiates it from the other spp.

Staph.epidermidis a coagulase-negative species, is a commensal of the skin, but can cause severe infections in immune-suppressed patients.

Staph.saprophyticus another coagulase-negative species that is part of the normal vaginal flora, is predominantly implicated in genitourinary tract infections in sexually active young women.

Morphology

Staphylococci are spherical cells arranged in grape like clusters, The bacterium divides along two axes, so forming clumps of bacteria. This is as opposed to [streptococci](#) which divide along one axis and so form chains (strep. meaning twisted or pliant). Young cocci stain Gram (+), but on aging many cells become Gram (-). Staphylococci are nonmotile and do not form spores. Some are encapsulated.

Cultural characteristic

Staphylococci grow readily on most bacteriologic media under aerobic or microaerophilic conditions. They grow at 37c° but form pigment best at room temperature (20 – 25 c°).

Colonies on nutrient agar are round, smooth, raised and glistening. *staph.aureus* usually forms deep golden yellow colonies. *Staph.epidermidis* colonies usually gray to white color.

On blood agar the *staph.aureus* cause β -haemolysis. *Staph. aureus* can grow in high concentration of NaCl (6.5-10 %).

Biochemical reaction

Staphylococci ferment many carbohydrate (glucose, lactose , sucrose, mannitol) produce acid without gas. Staphylococci produce catalase which differentiates them from the streptococci. The mannitol fermentation is very important due to its association with pathogenicity and coagulase and phosphatase production.

Diagnosis

1-Specimens: swab of pus, blood, or spinal fluid.

2- Smears: Typical staphylococci are seen in stained smear of pus or sputum. It is not possible to distinguish saprophyticus from pathogenic organisms.

3- Culture: specimens planted on blood agar give typical colonies in 18 hours at 37C. *Staph. aureus* but not others ferment mannitol. Specimens contaminated with mixed flora can be cultured on media containing 7.5-10% NaCl.

4-Catalase test: *Staph. aureus* is catalase (+).

5-Coagulase test: Rabbit or human plasma diluted 1:5 is mixed with an equal volume of broth culture or growth from colonies on agar and incubated at 37C. If clots form in 1-4 is positive.

(All coagulase positive staphylococci are pathogenic for human and animals)