Lab/6:- Gram positive bacteria :-

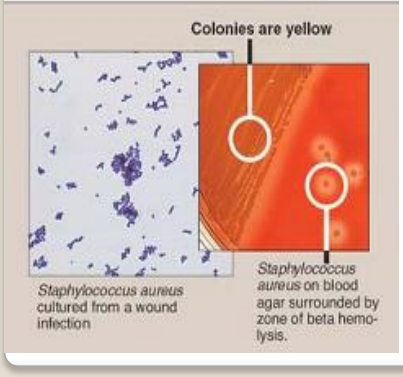
A/Gram + cocci (**Staphylococci and Streptococci**).

1. Staphylococci:

I- General features:

- Staphylococci are G+ve cocci (spherical or grapes shape).
- Are non motile, non capsulated, non spore forming.
- Staphylococci are oxidase negative & catalase positive which one feature that distinguishes from Streptococci.
- Staphylococci are part of normal flora of human skin, nose, respiratory and gastrointestinal tracts. Are also found in air, dust and other in human environments.
- *Staphylococcus* has at least 30 spp., three spp of clinical importance are *Staphylococcus aureus (S. pyogenes), S. epidermidis (S. albus), S. saprophyticus (S. citrus).*

Species	Frequency of disease	Coagulase	Color of colonies	Mannitol fermentation
S. aureus	Common	+	Golden yellow	+
S. epidermidis	Common	–	White	–
S. saprophyticus	Occasional	–	Variable	–



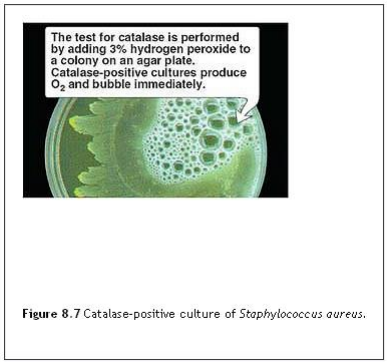


Figure 8.7 Catalase-positive culture of *Staphylococcus aureus*.

II- Transmission:

S. aureus is major pathogenic spp for human.

Transmission of bacteria from human to human by inhalation of respiratory secretion or consumption of contaminated food.

B: Clinical significance, Staphylococcal infections are classified as:

- **Skin infections**; such as abscess, pyoderma (impetigo), furuncles, carbuncles, styes, boils, folliculitis, cellulites, toxic shock syndrome, and scalded skin syndrom.
- **Respiratory tract infections;** such as tonsillitis, pharyngitis, sinusitis, pneumonia, and Otitis media.
- **Other infections**; endocarditis, osteomyelitis, meningitis, and nosocomial infections.
- **Food poisoning (Staphylococcal gasteroenteritis).**

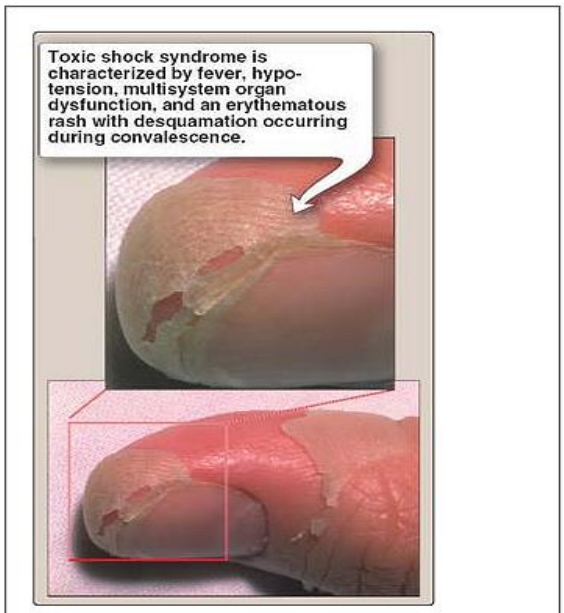


Figure 8.6 Desquamation of skin in toxic shock syndrome.

Folliculitis caused by *Staphylococcus aureus*

Carbuncle caused by *Staphylococcus aureus*

Furuncle caused by *Staphylococcus aureus*

Scanning electron micrograph of cardiac pacemaker lead colonized by *S. aureus*

Staphylococcal scalded skin syndrome

Superficial impetigo

IV- Laboratory diagnosis:

A: smear examination, stained smear shows G+ve cocci arranged in cluster.

B. culture of *S. aureus,* the sample is plated on blood agar, showing yellow colonies with Beta hemolytic. Identifications of bacteria is confirmed by catalase positive, coagulase test positive, mannitol fermentation, and grow in high concentration (7.5%) of NaCl.

V- Control

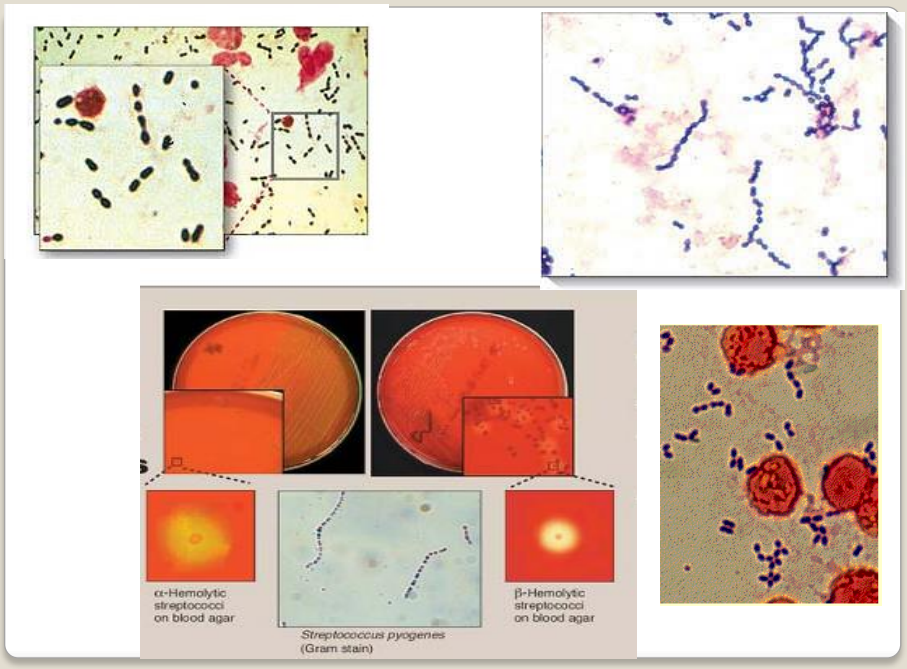
2. Streptococci

I- General features:

1. 1. Streptococci are G+ve cocci (spherical, chain or pairs shape).
2. 2. Are non motile, non spore forming and non capsulated (some strain have capsule).
3. Streptococci are oxidase & catalase negative which one feature that distinguishes the Streptococci from Staphylococci.
4. Streptococci are member of normal flora skin, respiratory tract and some are normal flora of enteric and genital tracts of human.

A streptococcus has at least 20 spp. *S. pyogenes,* and *S. pneumoniae* are clinical

Importance for human.



II- Transmission:

Respiratory tract infections (*S. pyogenes*) are transmitted by inhalation of respiratory droplets. Skin infection occurs after direct contact with infected individuals or contaminated fomites.

Clinical features Streptococcal infections are classified as:

1- pyogenic infections (skin & respiratory tract infection)

2- Respiratory tract infection;

3- Sore throat (tonsillitis) after incubation periods (1-3 days), or its may be invade pharynx and causes pharyngitis.

4- It may be causes severe pneumonia with fever and cough.

Facial erysipelas

Impetigo

Streptococcal pharyngitis