

## Staphylococcus Toxin

*Staphylococci* Gram-positive, Cocci, 0.5-1.5µm in diameter. Form irregular grapelike clusters. Non-motile, non- sporing. Often found in the human **nasal cavity, mucous membranes and skin**. There are **2** species of staphylococci commonly associated with clinical infections: *Staphylococcus aureus*, and *S. saprophyticus*.

### S. aureus Toxin

Amongst the more common **toxins** secreted by *S. aureus* are:-

- 1- Hemolysins (Alpha, Beta, Gamma) → cause lysis red blood cells RBCs
- 2- Leuko-toxin. → cause lysis white blood cells WBCs.
- 3- Staphylococcal Exfoliative Toxins (ETs). → cause skin infection
- 4- Staphylococcal Enterotoxins (SEs) → cause vomiting and diarrhea.
- 5- Toxic-shock syndrome toxin-1 (TSST-1). → Fever, rash, and shock.

### Classification

#### 1- Based on pigment production

*S.aureus*: golden-yellow pigmented colonies & *S saprophyticus*: gray colonies.

#### 2- Based on pathogenicity

*S.aureus* is **pathogenic** that causes skin lesions, deep- infections.

*S saprophyticus* causes urinary tract infections, especially in **girl**.

### Identification of S. aureus by many steps:

*S. aureus* can grow at a temperature range between **15° to 45°C** and **at Na Cl** concentrations up to 15%. *S. aureus* is resistant to high osmolality, detergents, as well as alcohol. Mannitol salt agar containing **7.5% Na Cl** (most media contain 0.5% Na Cl) has been used as a selective medium, as *S. aureus* is capable of fermenting mannitol.

Tast	Gram Stain	Coagulase	Manitol S.A	Novobiocin disc	Catalase	Hemolysis	DNase
<i>S. aureus</i>	GV+	+	+	<b>Sensitive</b>	+	<b>Beta</b>	+
<i>s. saprophyticus</i>	GV+	-	-	<b>Resistente</b>	+	<b>Gamma</b>	-

### Diagnosis

- 1- Animal assay
- 2- Serological assay = Enzyme-linked immunosorbent assay (ELISA)
- 3- Culture =On Mannitol salt agar, DNase agar, and Blood agar to see hemolysis.
- 4- Biochemical test: Coagulase, Catalase and Novobiocin disc.