# Microbiology 1

2025-2024

Dr.Saja Ebdah

ARKAN
ACADEMY

# Staphylococci

- **Characteristics**:
  - Morphology: Gram-positive, non-motile, spherical cells (~1 µm), arranged in grape-like clusters.
  - Notable Species: *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus lugdunensis*, and *Staphylococcus saprophyticus*.
    - ✓ *S. aureus* is coagulase-positive, while coagulase-negative staphylococci (CoNS) are part of the normal human microbiota.
  - Catalase Test: Staphylococci are catalase-positive, which distinguishes them from catalase-negative streptococci.

- **Structure and Physiology**:
  - Cell Wall Components:
    - ✓ Peptidoglycan: Activates immune response, chemoattractant for leukocytes, endotoxin-like activity, and activates complement.
    - ✓ MSCRAMMs: Microbial surface proteins (e.g., Protein A, clumping factor) aiding in host cell adhesion and virulence.
    - ✓ Teichoic Acids: Linked to peptidoglycan, antigenic.

- **Epidemiology**:
  - Habitat: Normal microbiota of skin, respiratory, and gastrointestinal tracts.
  - Nasal Carriage: *S. aureus* is carried by 20-50% of people, with higher rates in hospital patients and healthcare workers.
  - MRSA: Emerged in hospitals in the 1980s, now also found in community and livestock, affecting immunocompromised groups, elderly, and hospitalized patients.

- **Clinical Manifestations**

1. Localized Infections:
   - ✓ Impetigo: Pus-filled vesicles on erythematous bases.
   - ✓ Folliculitis: Infection in hair follicles.
   - ✓ Furuncles (Boils): Painful, pus-filled nodules.
   - ✓ Carbuncles: Clusters of boils with systemic symptoms (fever, bacteremia).

2. Toxin-Mediated Diseases:
   - ✓ Food Poisoning: Caused by ingestion of heat-stable enterotoxins, leading to nausea, vomiting, and diarrhea.
   - ✓ Scalded Skin Syndrome: Skin desquamation in infants without organism presence in blisters.
   - ✓ Toxic Shock Syndrome: Multisystem reaction with fever, hypotension, rash; requires rapid treatment.

3. Coagulase-Negative Staphylococcus (CoNS) Infections:
   - ✓ Device-Related Infections: Prosthetic devices, catheters, and shunts are common sites, especially *S. epidermidis*, due to biofilm formation.
   - ✓ Endocarditis: Particularly in artificial valves.
   - ✓ Urinary Tract Infections: *S. saprophyticus* causes infections in young, sexually active women; other CoNS in catheterized patients.

# ARKAN

ACADEMY

علم في كل مكان


Arkan academy

Arkanacademy

www.arkan-academy.com

+962 790408805