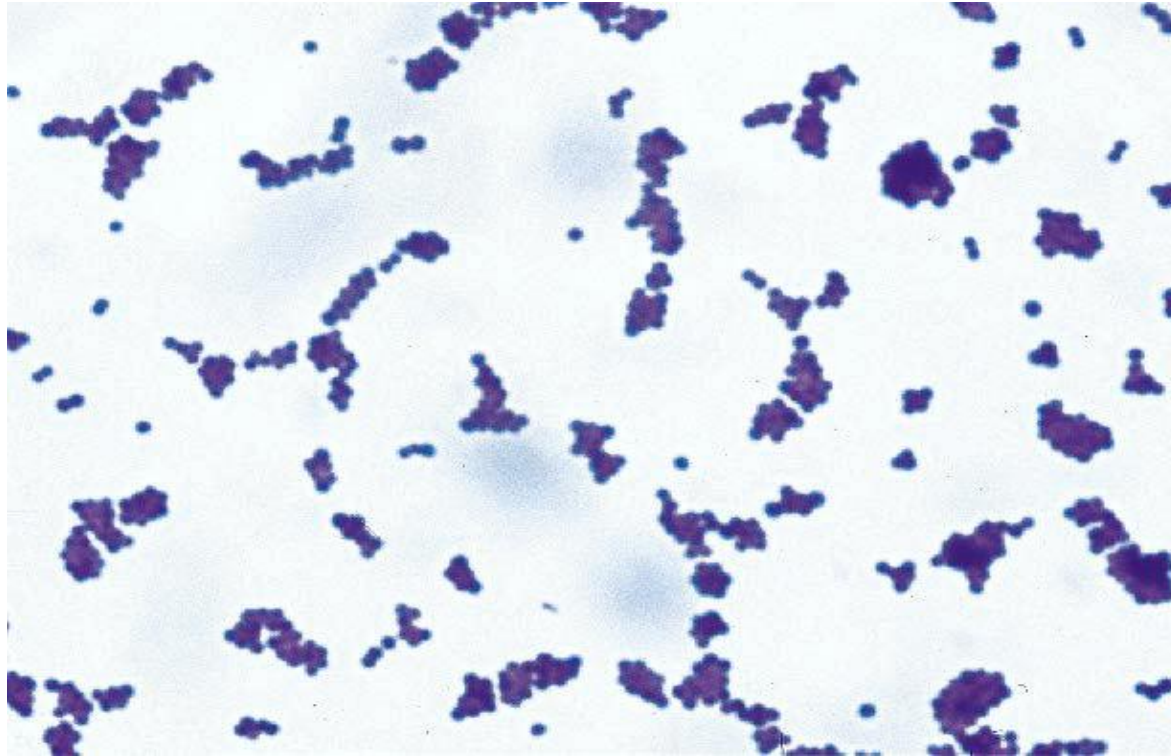
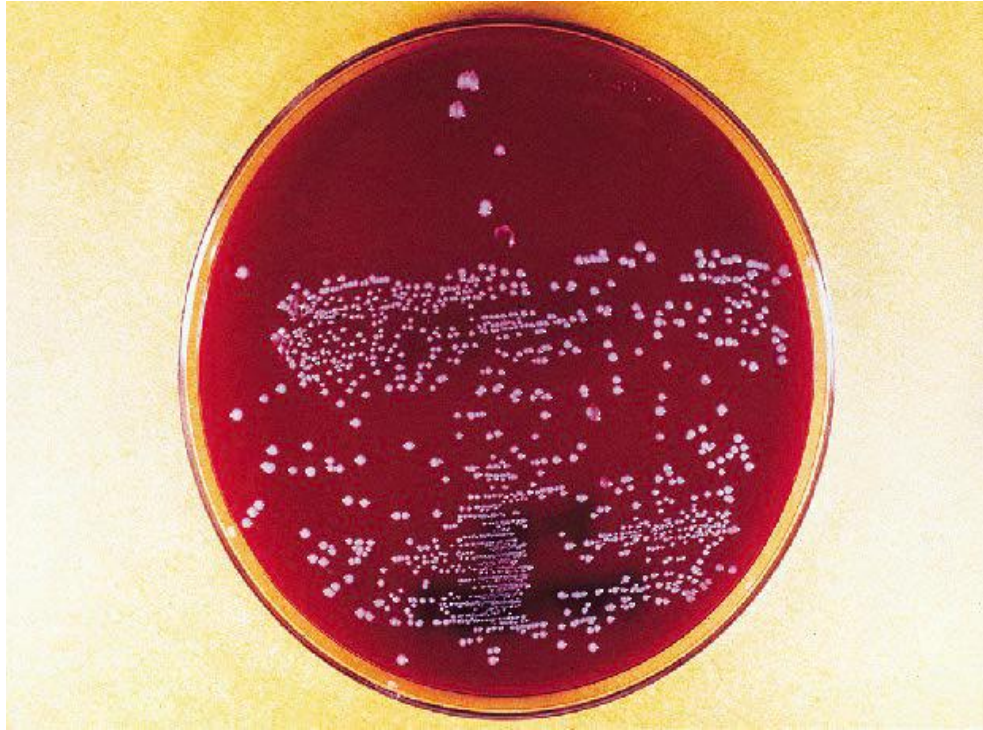


Staphylococcus

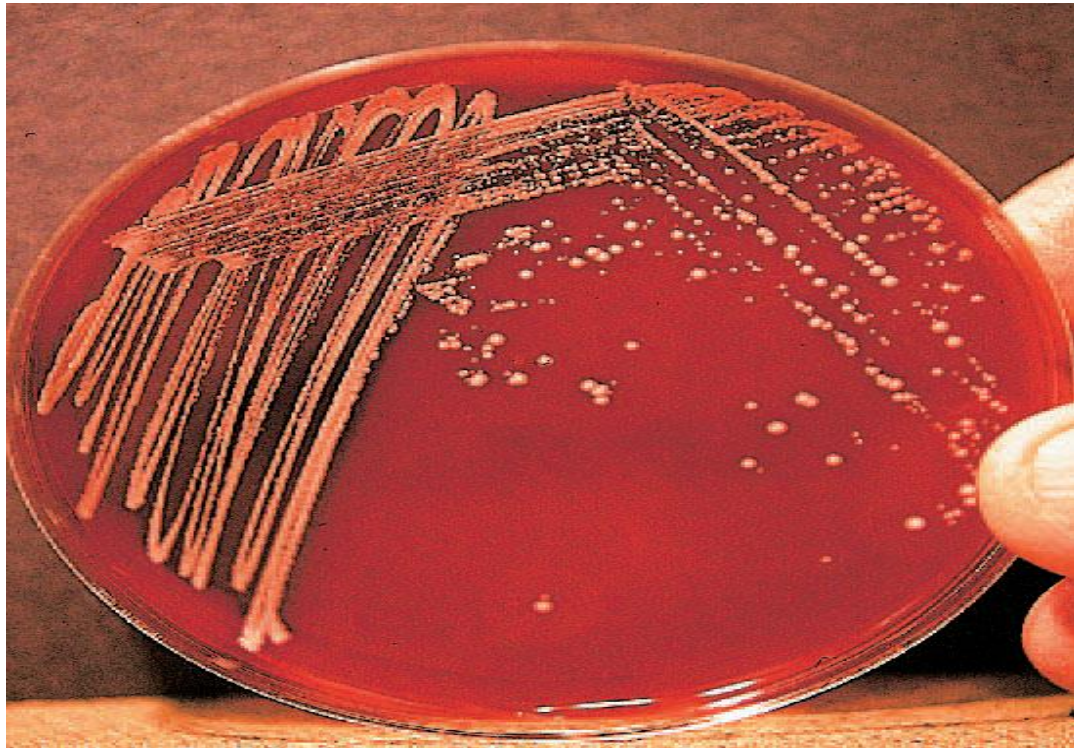
Lab Dx



Morphology of Staphylococci. grapelike clusters of gram-positive cocci



Culture of *Staphylococcus epidermidis* on Blood Agar. Notice the white, opaque, nonhemolytic, smooth colonies characteristic of *S. epidermidis*.



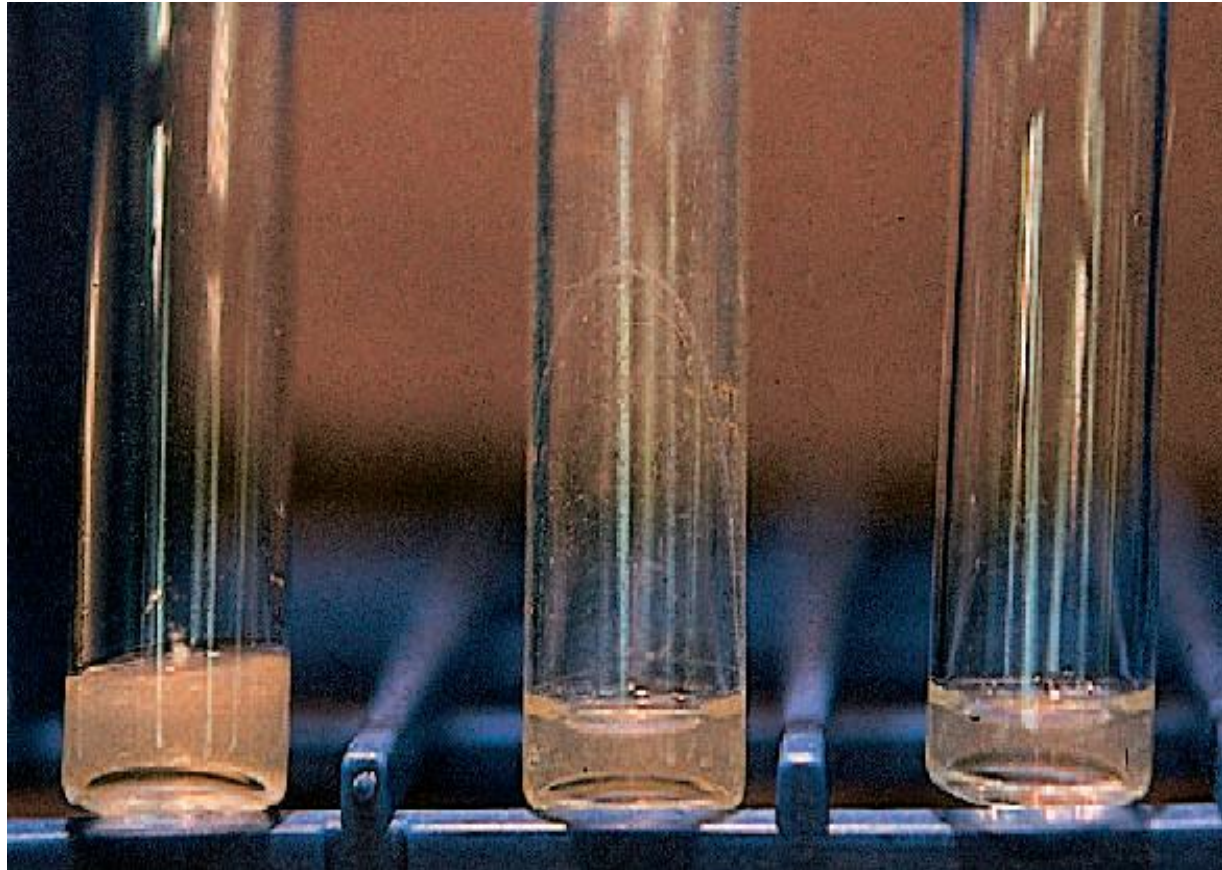
Culture of Staphylococci on Blood Agar. Blood agar plate on which large, smooth, β -hemolytic colonies of *S. aureus* are growing. The lysis of the RBCs is due to alpha toxin production.



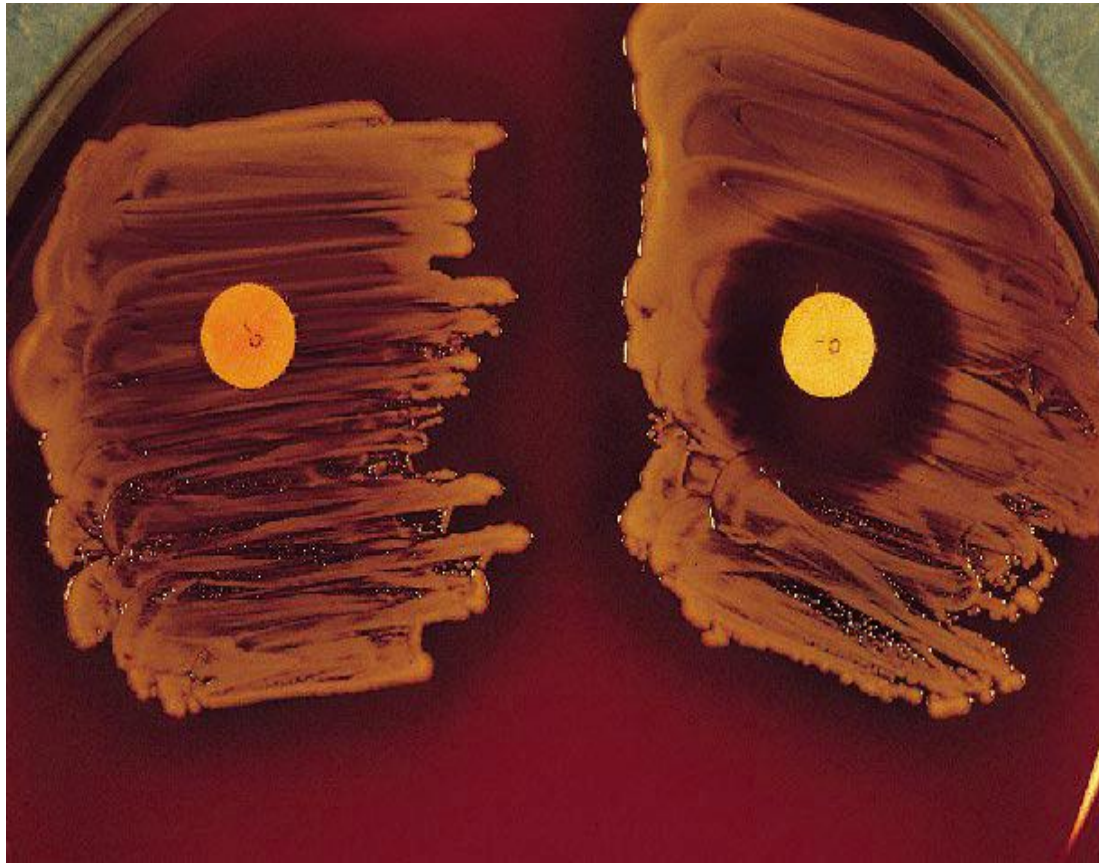
Culture of *Staphylococcus aureus* on Mannitol Salt Agar. Notice that the medium has turned yellow around the growing bacteria since the bacteria are able to ferment the mannitol and produce an acid pH.



Culture of *Staphylococcus epidermidis* on Mannitol Salt Agar. Notice the small white colonies that do not use the mannitol; that is, no color change is observed since no acid has been produced.



Coagulase Test. Coagulase producing strains of *S. aureus* form a clot (solid fibrin gel) when grown in plasma (tube on the left), whereas coagulase negative staphylococci (*S. saprophyticus* [middle tube] and *S. epidermidis* [tube on the right]) do not form a clot



Novobiocin Susceptibility Test. (Left on plate) Novobiocin resistance evidenced by lack of zone of inhibition (or a zone less than 17 mm) surrounding a novobiocin disk. Resistance is typical of *Staphylococcus saprophyticus*. (Right on plate) Novobiocin susceptibility evidenced by a zone of inhibition greater than 16 mm surrounding the novobiocin disk. Sensitivity is typical of *Staphylococcus epidermidis* and other coagulase-negative staphylococci, other than *S. saprophyticus*.

The test for catalase is performed by removing a colony to a slide with a drop of 3% hydrogen peroxide. Catalase-positive cultures produce O₂ bubbles. Here it is demonstrated more dramatically directly on a plate.



Gram (+) cocci

Staphylococcus species

Staphylococcus aureus

- Skin and soft tissue infections
- Osteomyelitis
- Septic arthritis
- Endocarditis
- Septicemia
- Necrotizing pneumonia
- Toxic shock syndrome
- Food poisoning (antibiotic therapy not used)

Methicillin susceptible

1 Oxacillin

1 Nafcillin

Methicillin resistant (health-care associated)

1 Vancomycin

Methicillin resistant (community-acquired; mild-moderate infection)

1 Trimethoprim/sulfamethoxazole

1 Doxycycline

Methicillin resistant (community-acquired; severe infection)

1 Daptomycin

1 Linezolid

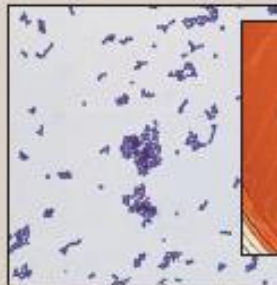
1 Vancomycin

2 Quinupristin-dalfopristin

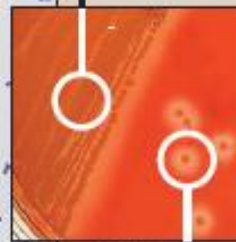
2 Telcoplanin

Note: Treatment of MRSA may vary by the type and location of infection.

Colonies are yellow



Staphylococcus aureus cultured from a wound infection



Staphylococcus aureus on blood agar surrounded by zone of β hemolysis.

- Catalase (+)
- Nonmotile
- Do not form spores
- Round cocci tending to occur in bunches like grapes
- Facultative anaerobic organisms
- Cultured on enriched media containing broth and/or blood

Staphylococcus epidermidis

- Infections of catheters and heart valves

1 Oxacillin

1 Nafcillin

2 Vancomycin²

¹ Most isolates resistant to penicillin G

² Used in methicillin-resistant isolates

Staphylococcus saprophyticus

- Cystitis in women

Ciprofloxacin



Carbuncle caused by Staphylococcus aureus



Furuncle caused by Staphylococcus aureus



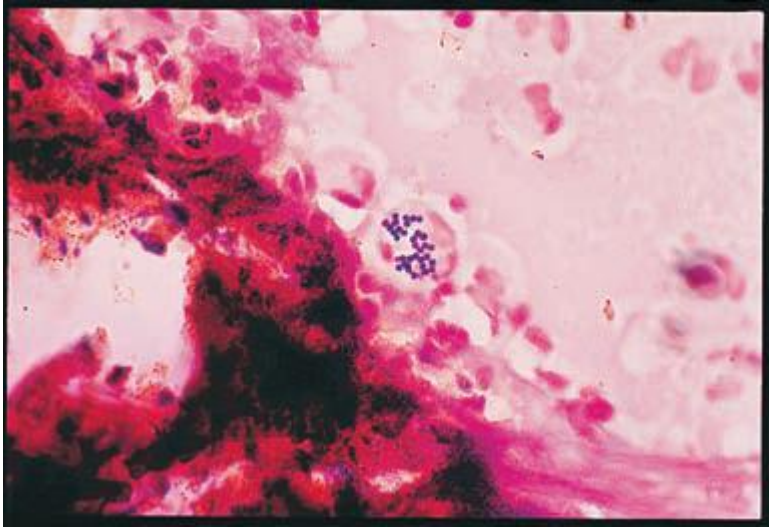
Folliculitis caused by
Staphylococcus aureus



Staphylococcal scalded skin syndrome



Superficial impetigo



Cases in medical microbiology (skin infection)