MEDICAL MICROBIOLOGY

LAB 8

Staphylococcus

(Gram positive cocci)

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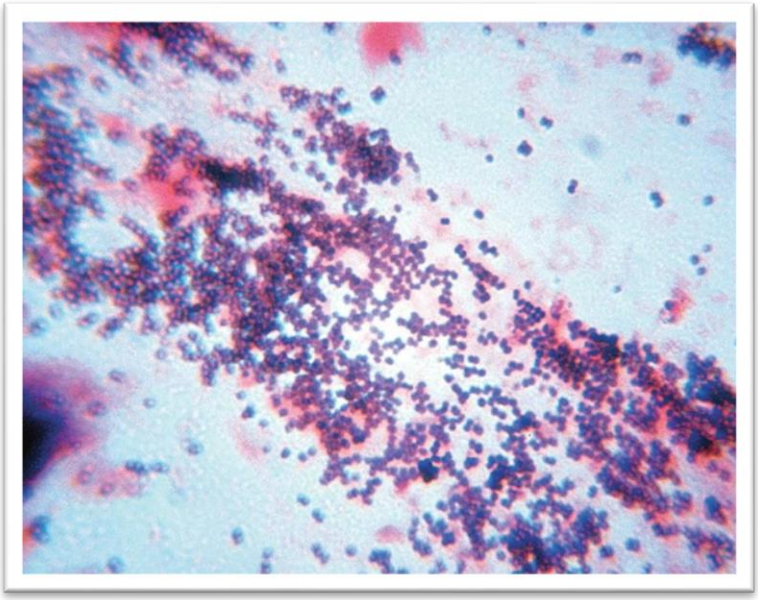
Staphylococcus

Staphylococci are gram positive spherical bacteria that divide in more than one plane to form irregular clusters of cells . The staphylococci are non-motile, non-spore-forming, and able to grow in media containing high salt concentrations . Most are considered facultative anaerobes.



Gram stain of *Staphylococcus aureus*

S. aureus ferments mannitol to produce acid. This metabolic characteristic can be observed when cultures of *S. aureus* are grown on mannitol salt agar (MSA) . The production of acid lowers the pH of the medium , causing the phenol red indicator to turn from red to yellow .

(a)

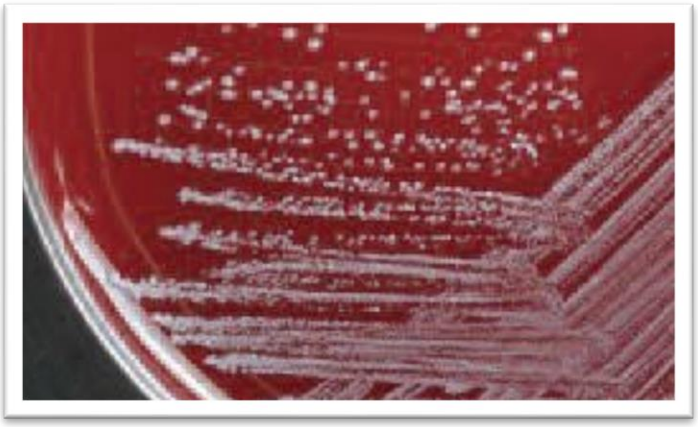
(b)

Staphylococcus epidermidis (a) and *Staphylococcus aureus* (b) growing on a **mannitol salt agar plate**. Note the color change that occurs due to acid production from the fermentation of mannitol by *S. aureus* .

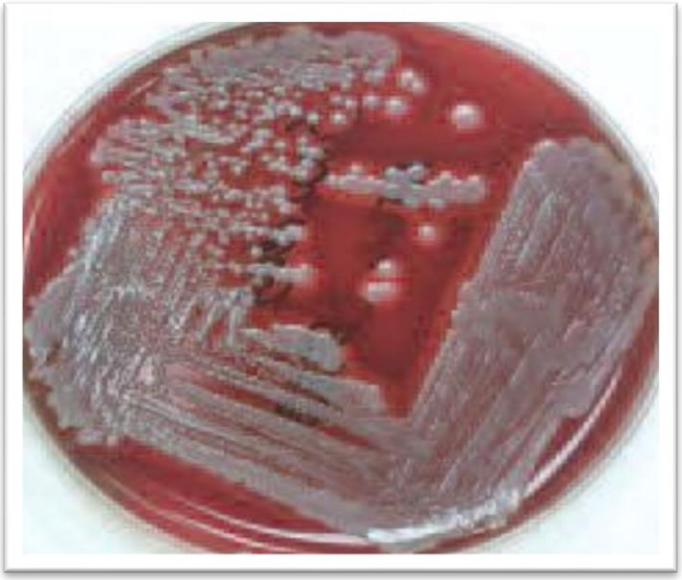
Differentiation of Three Species of Staphylococci

	S.aureus	***S.epidermidis***	***S.saprophyticus***
Alpha toxin	**+**	_	_
Mannitol fermentation	**+**	_	**(+)**
Coagulase	**+**	_	_
Dnase	**+**	_	_
Novobiocin	**S**	**S**	**R**

Note : S = Sensitive , R = Resistant , + = positive , (+) = Mostly positive



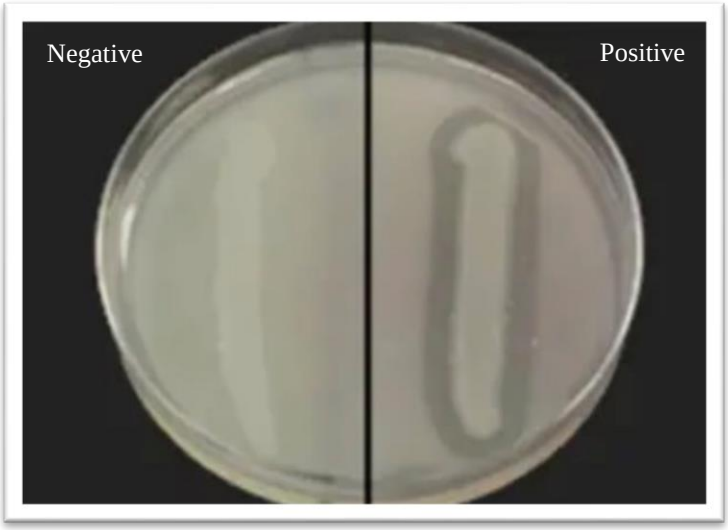
***Staphylococcus epidermidis* grown on sheep blood agar**
The colonies are white, raised, circular (no hemolysis)



***Staphylococcus aureus* on sheep blood agar**

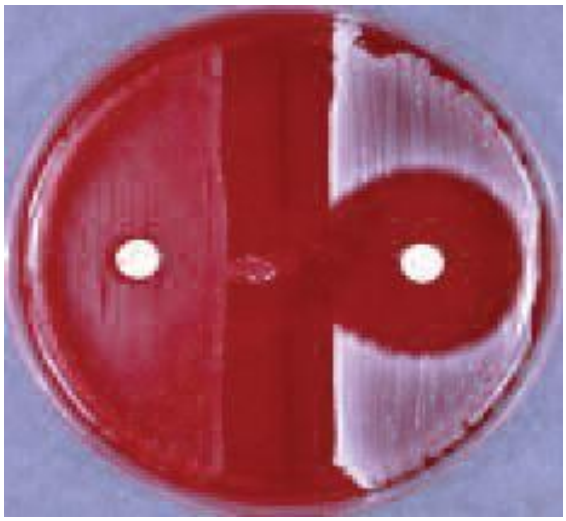
Note : the-hemolysis

Coagulase test: Positive test with negative test. The Coagulase Test is typically used to differentiate *Staphylococcus aureus* from other Gram-positive cocci.



DNase test negative and positive after adding HCL

DNase Test Agar is used to distinguish *Staphylococcus aureus* (+) from other Staphylococcus species



NOVOBIOCIN DISK TEST *Staphylococcus saprophyticus (R)*

is on the left; *Staphylococcus epidermidis* (S) is on the right