

# THROAT SWAB

## Gram Positive Coccus

*The Most common  
Pathogenic Bacteria  
that colonize the throat are...*

1

**Staphylococcus  
Spp.**

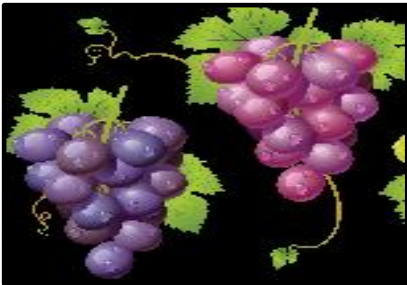
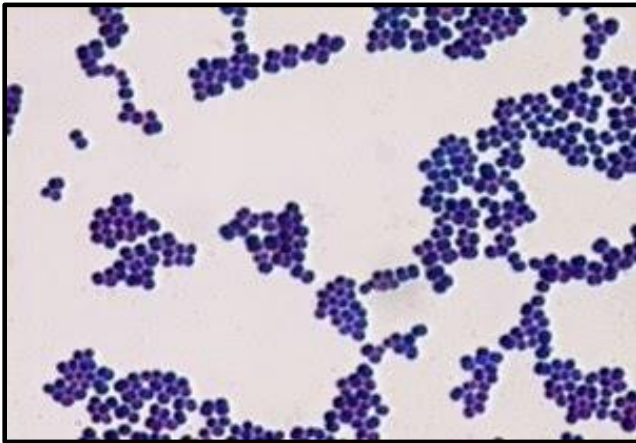
2

**Streptococcus  
Spp.**

# GRAM STAIN

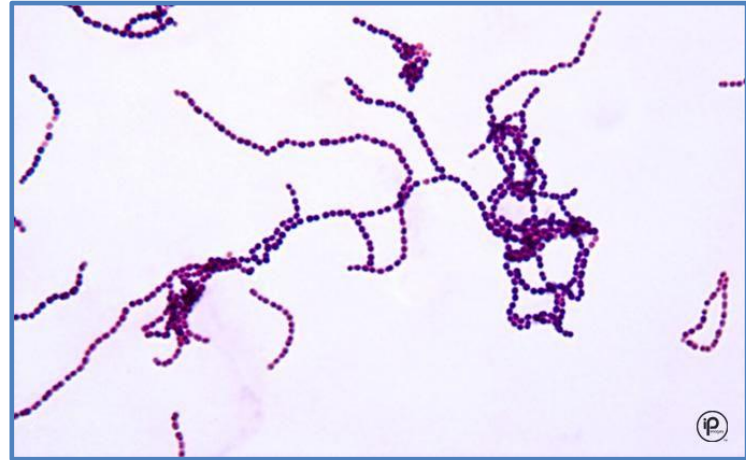
Grape shaped and  
it is larger

## Staphylococcus



chains and  
smaller

## Streptococcus



## A- Staphylococcus .albus

<sup>+</sup>  
other species of staph  
are coagulase negative and  
Produce white-Gray colony

## B- Staphylococcus.aureus

↳ The Most Pathogenic  
among (staph.)  
→ it is coagulase Positive  
→ Produce Golden-Yellow  
colony



**Blood agar**

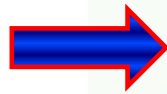
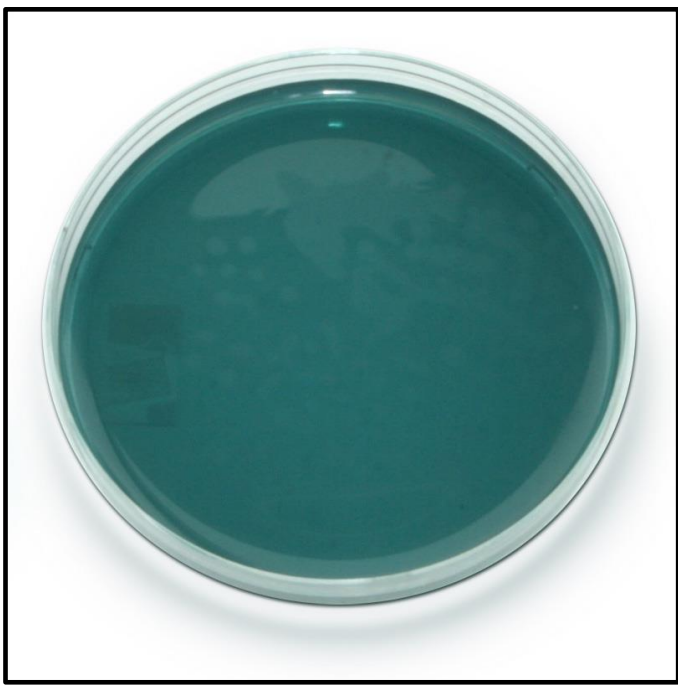
note: it is differential Media : Between lactose and non-lactose fermentus.



note: staph aureus  
Give Dark Yellow  
color

CLED media  
Lactose fermentation ( +ve )  
staphylococcus spp.

all staph species are lactose fermentus



# Test for differentiation of Staphylococcus species

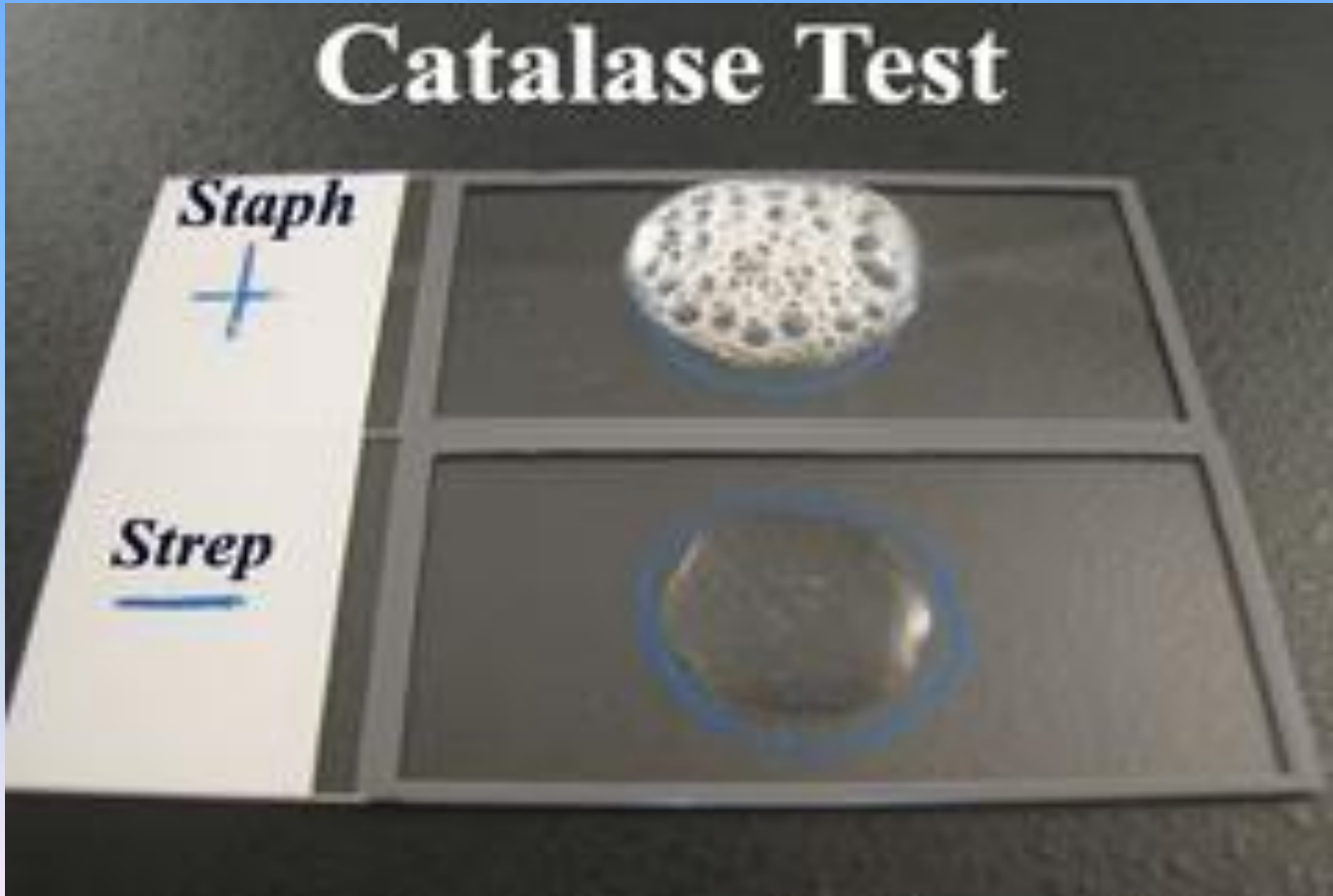


This test differentiate between staph and strep:-

staph → ⊕

strep → ⊖

# Catalase test



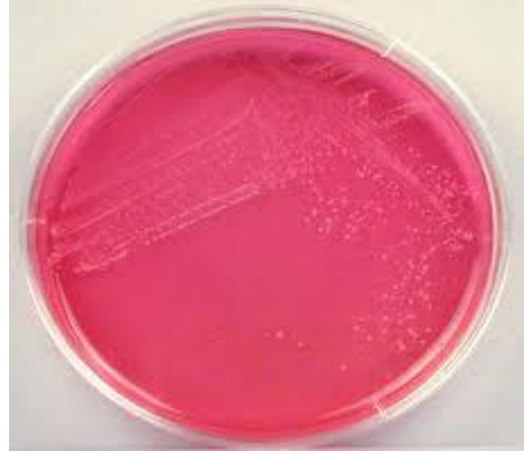
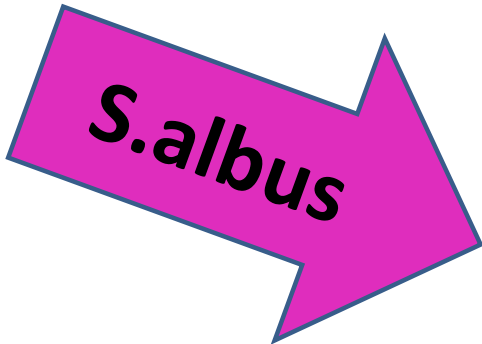
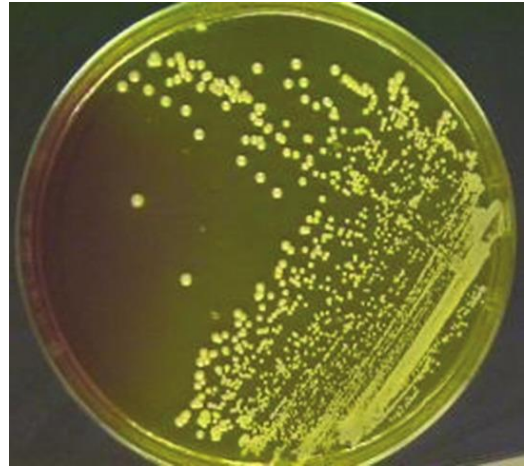
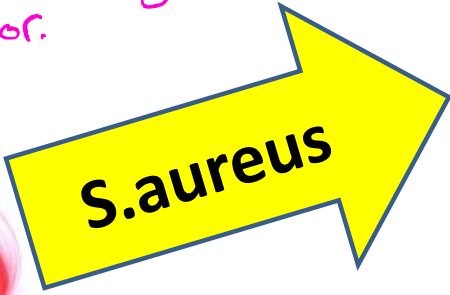
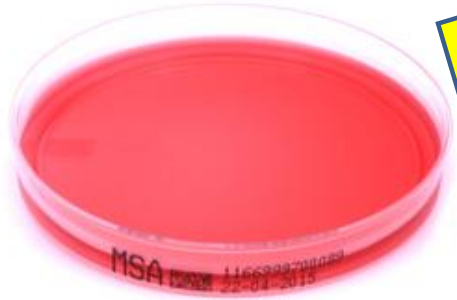


This test differentiate between  
stap. aureus and other species of  
stap.

# MSA

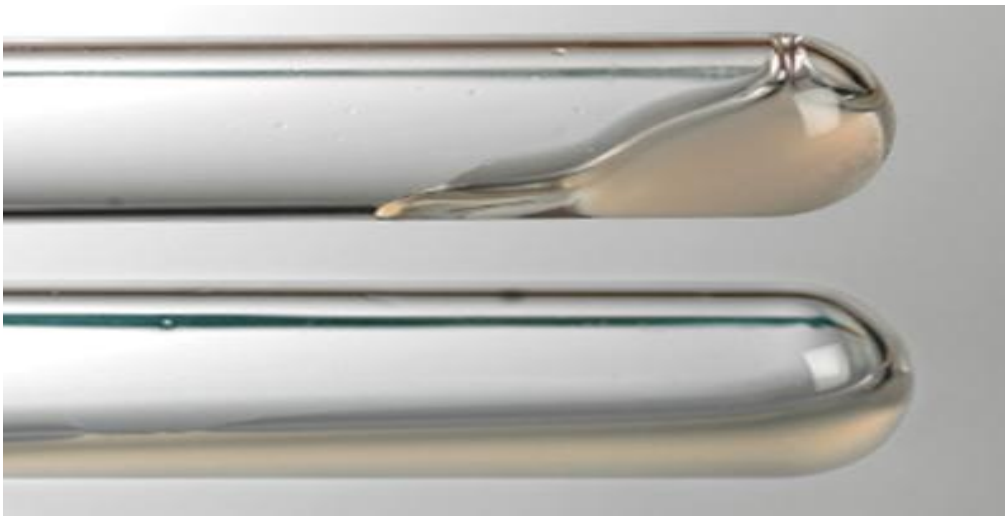
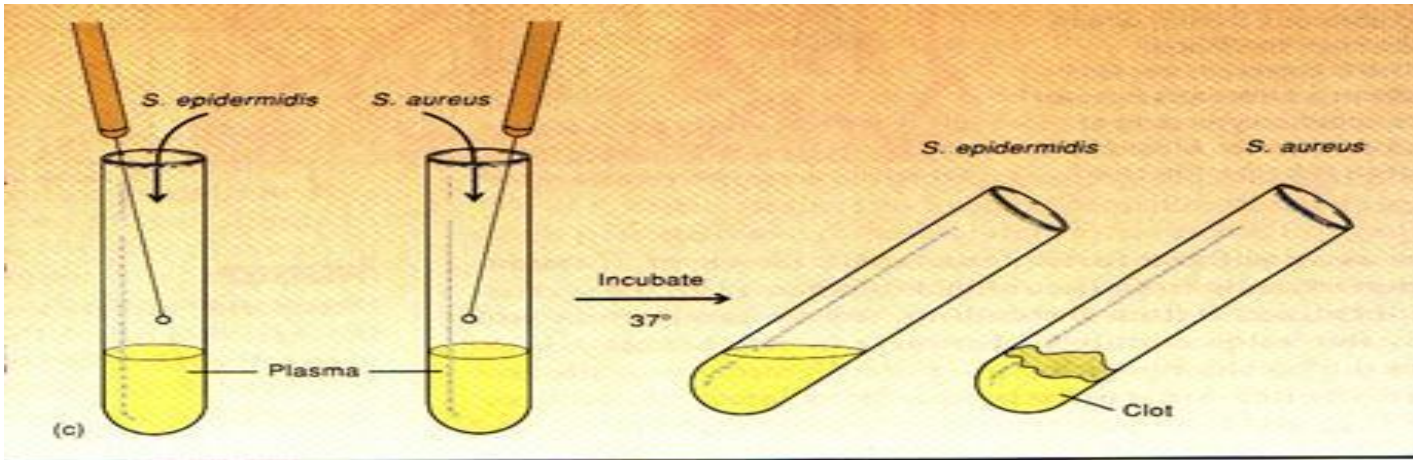
## Mannitol salt agar media

- There expensive but widely used.
- S.A gives Yellow color.



→ This test differentiates between staph. A and other species of staph.  
→ cheapest  
→ The result may appear after 2 H

# Coagulase test



← **S.aureus**

← **S.albus**



Staph. A has the ability to convert Fibrinogen to Fibrilin

# Streptococcus

**$\alpha$ -hemolytic**

green,  
partial hemolysis

**$\beta$ -hemolytic**

clear,  
complete hemolysis

**$\gamma$ -hemolytic**

no hemolysis

pneumoniae

optochin sensitive,  
bile soluble,  
capsule =>  
quellung +

Viridans

mutans, sanguis  
optochin resistant,  
not bile soluble,  
no capsule

pyogenes

Group A,  
bacitracin sensitive

agalactiae

Group B,  
bacitracin resistant

Enterococcus

E. faecalis,  
E. faecium

Memorize it



# Hemolysis on sheep blood agar

## Blood Agar:

Shows three types of hemolysis

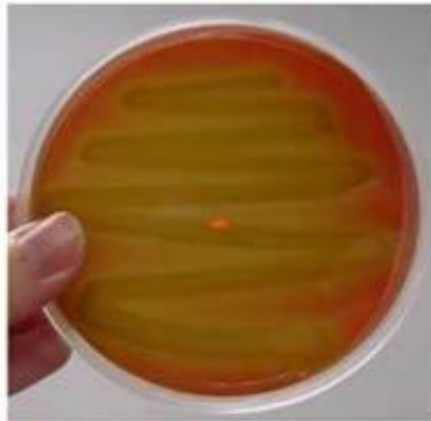
$\alpha$  Hemolysis

$\beta$  Hemolysis

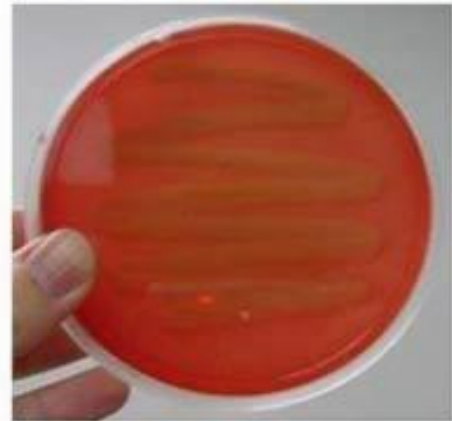
$\gamma$  Hemolysis



**Beta Hemolysis**



**Alpha Hemolysis**

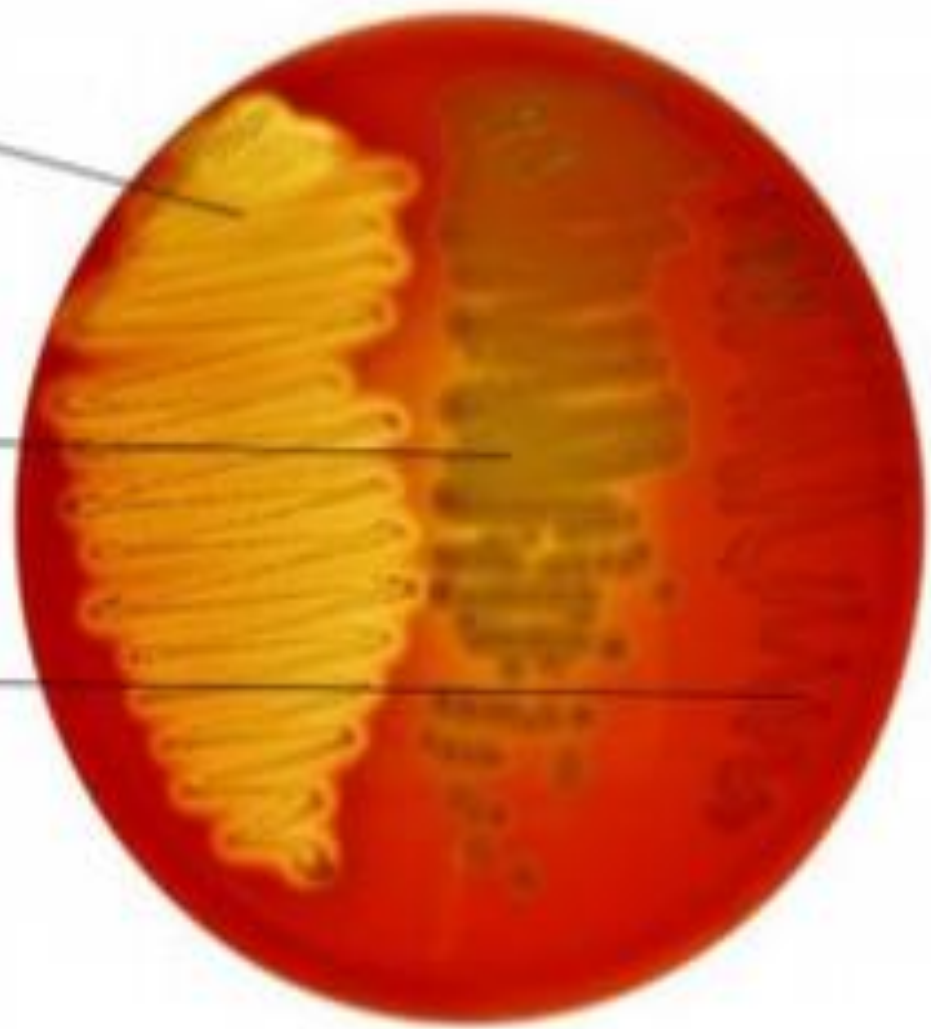


**Gamma Hemolysis**

**Beta**

**Alpha**

**None**

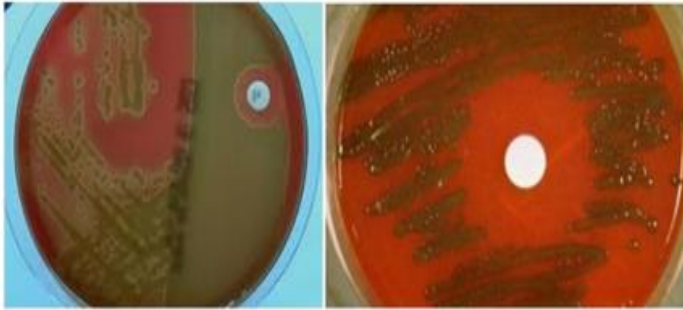


## Differentiation between $\alpha$ -hemolytic streptococci

	Hemolysis	Optochin sensitivity
<i>S. pneumoniae</i>	$\alpha$	Sensitive ( $\geq 14$ mm)
<i>Viridans strep</i>	$\alpha$	Resistant ( $\leq 13$ mm)

## Optochin test

*Streptococcus pneumoniae* ⇒ it is sensitive to optochin.



*Streptococcus pneumoniae* strain on blood agar showing alpha hemolysis (green zone surrounding colonies). Note the zone of inhibition around a filter paper disc impregnated with optochin. (sensitive to optochin)

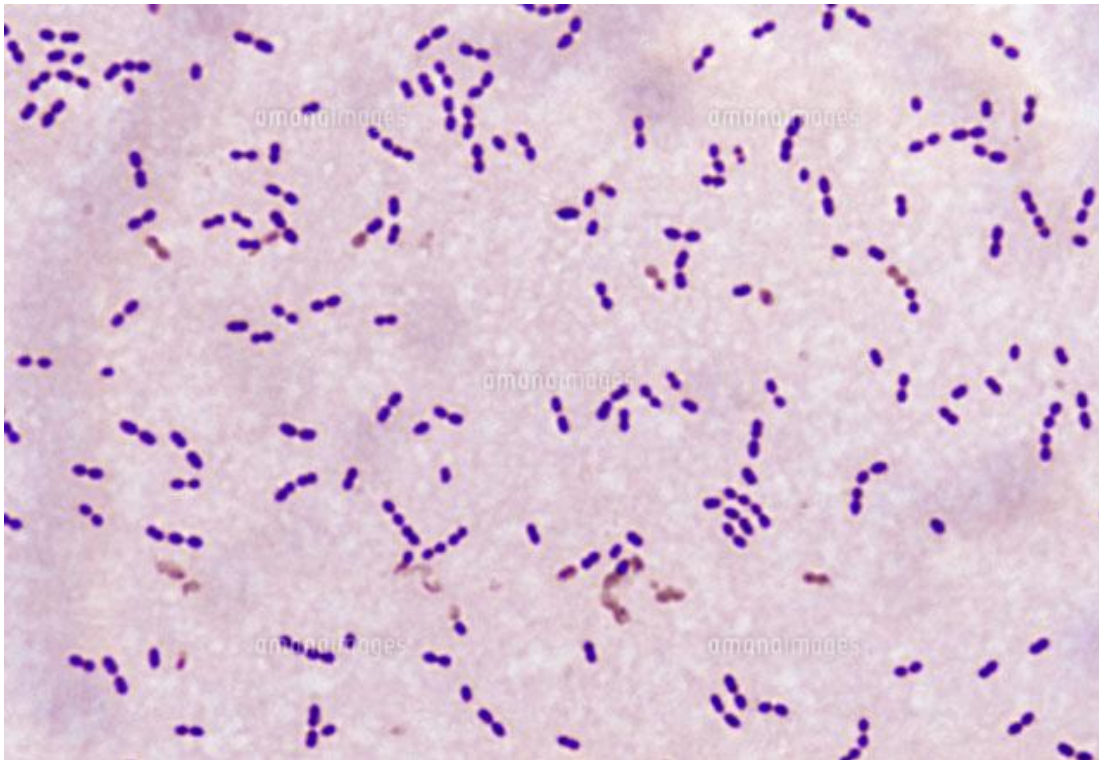
resistant  
→ NO ZONE of  
Inhibition. ←

## Optochin test *Streptococcus viridans*



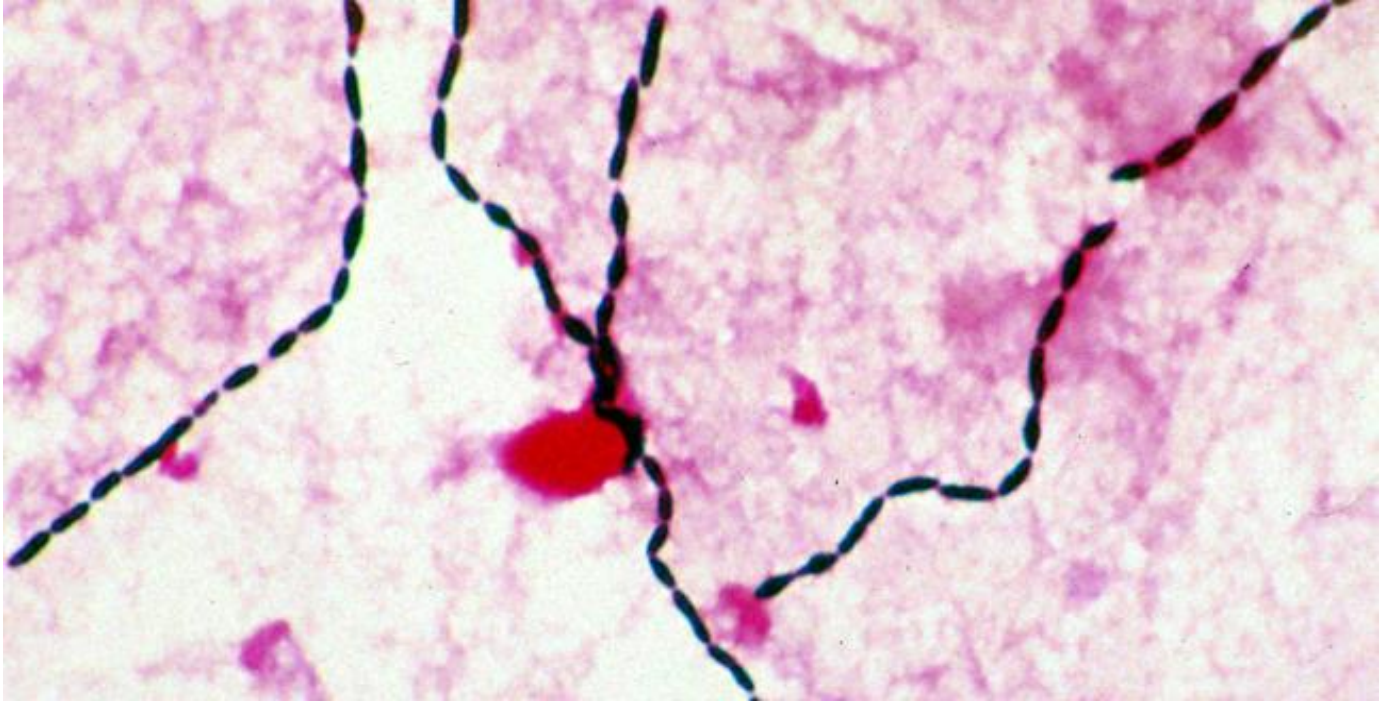
*Streptococcus viridans* strain on blood agar showing alpha hemolysis (green zone surrounding colonies). No zone of growth inhibition (Resistant) around a filter paper disc impregnated with optochin.

→ special character:- It appear as diplococci flaccid in  
shap.  
**Streptococcus pneumoniae**





# Streptococcus viridans



## Differentiation between $\beta$ -hemolytic streptococci

	Hemolysis	Bacitracin <u>sensitivity</u>
<i>S. pyogenes</i>	$\beta$	Susceptible
<i>S. agalactiae</i>	$\beta$	Resistant





Bacitracin test for *Streptococcus pyogenes*

# Gamma hemolysis streptococcus



**Enterococcus  
Group D  
- E. faecalis**

**Other than  
Enterococcus  
group D**

→ Group D :- can live in Bile (Bile resistant)

This test is used to differentiate Enterococcus Group D from other species of Enterococcus.

Reaction:

Esculin → Esculetin  
(Black)

# Bile-Esculin

Other than Enterococcus Group D  
**Negative**



**Enterococcus Group D Positive**

Thank you for listening, any  
questions?

