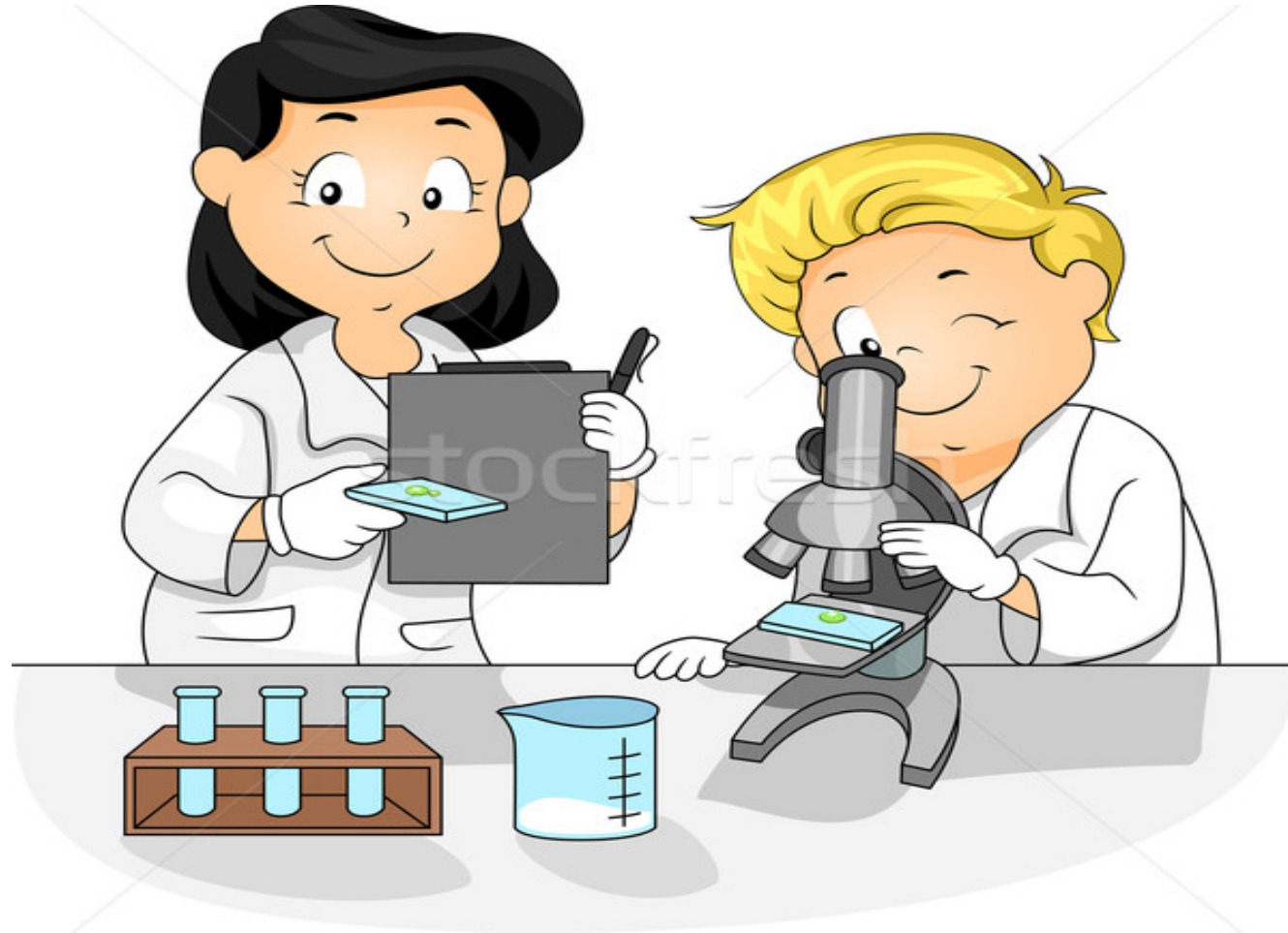
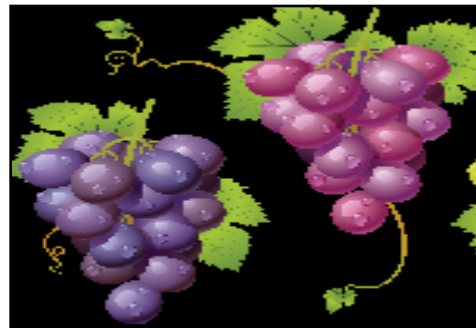
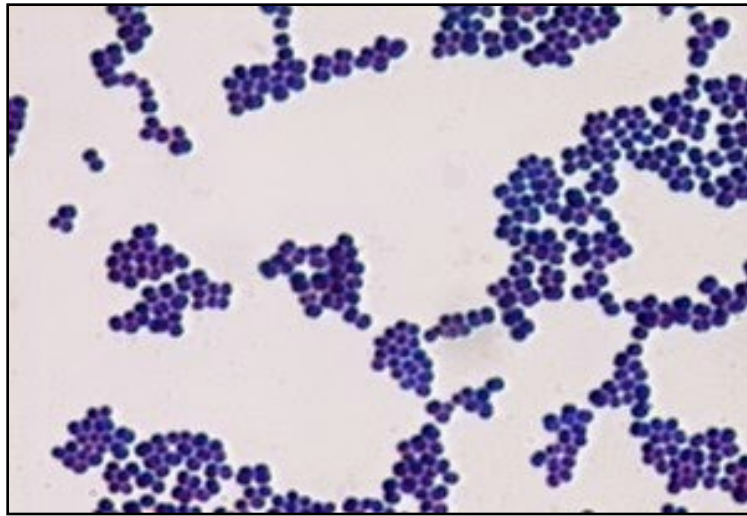


Gram Positive Bacteria

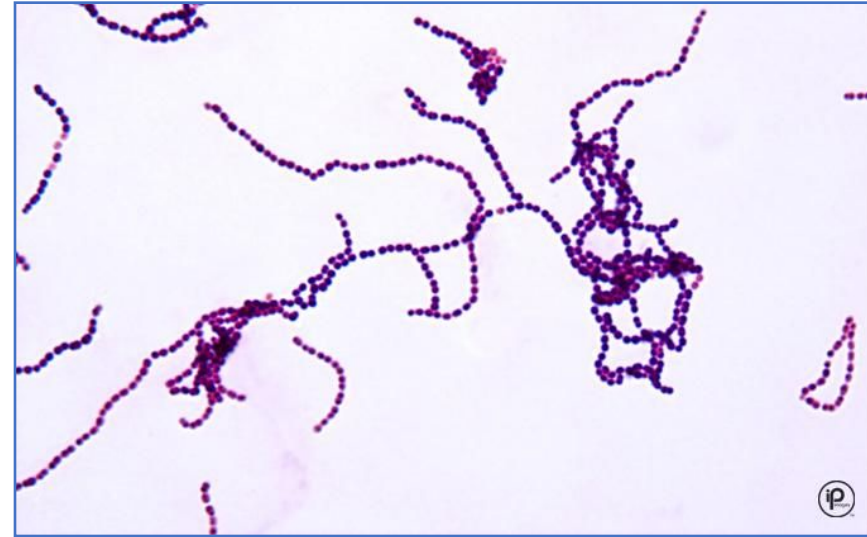


GRAM STAIN

Staphylococcus



Streptococcus





A- Staphylococcus .albus

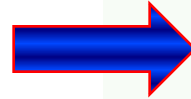
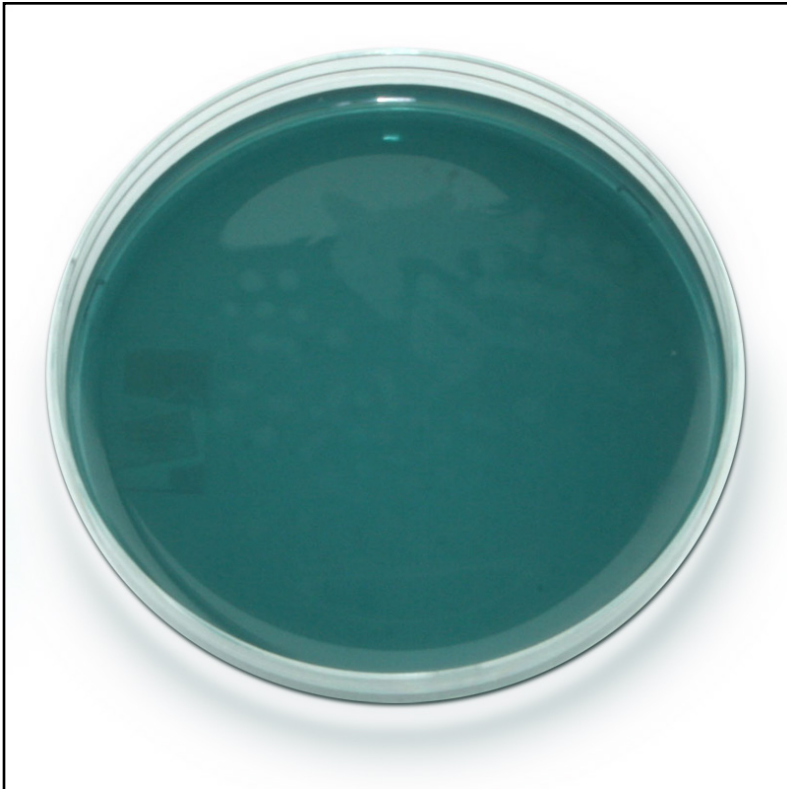
B- Staphylococcus.aureus



Blood agar



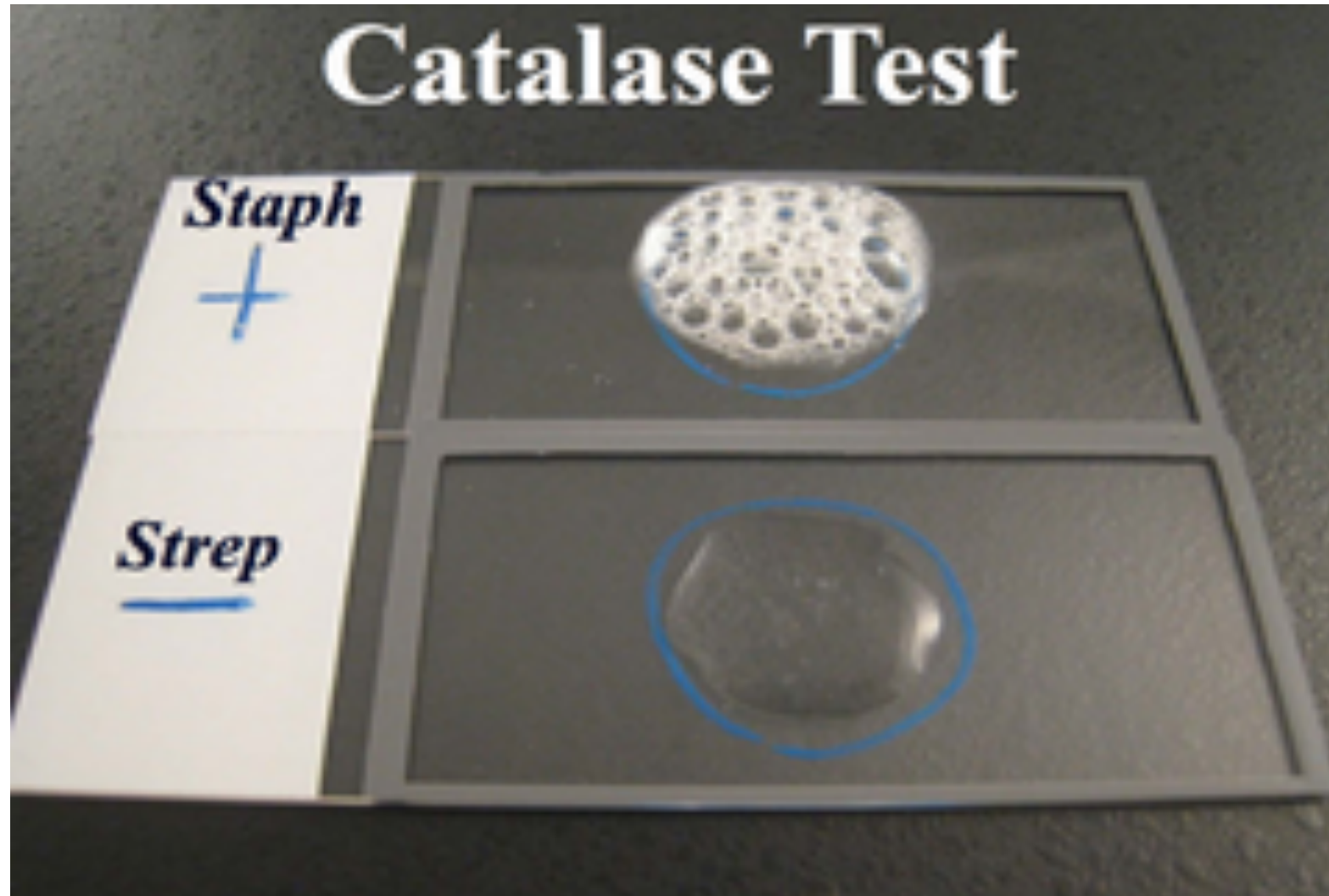
CLED media
Lactose fermentation (+ve)
staphylococcus spp.



Test for differentiation of Staphylococcus species

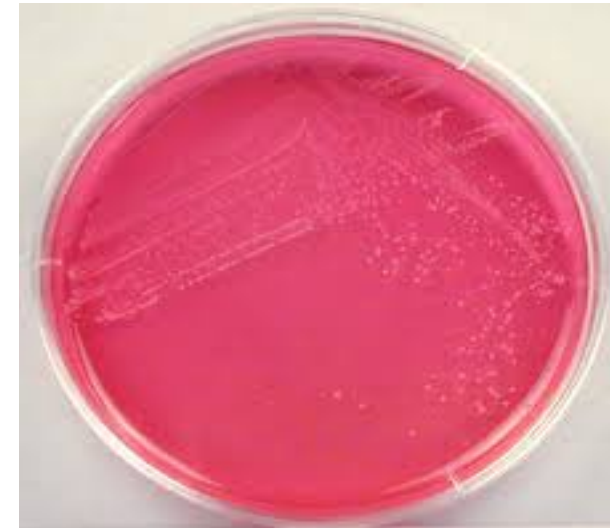
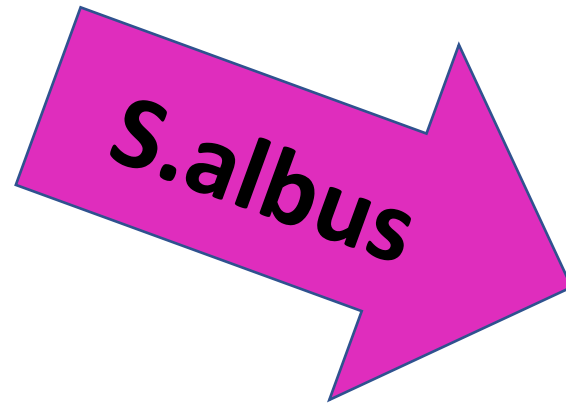
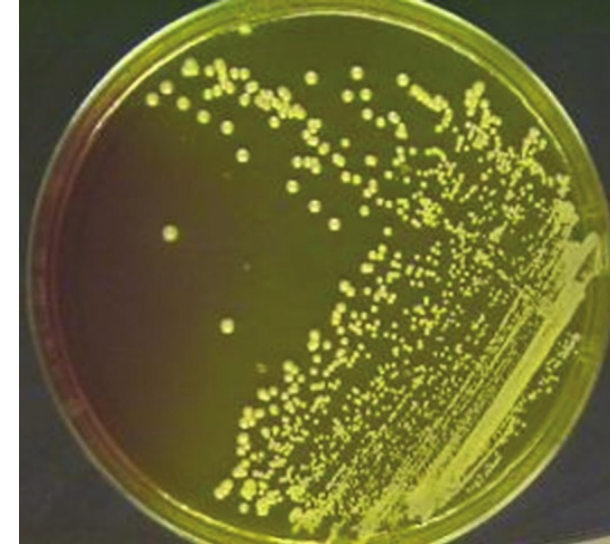
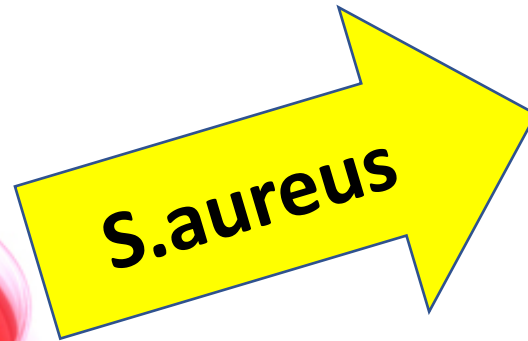
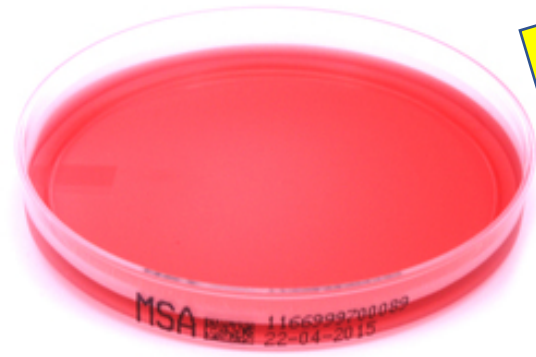


Catalase test

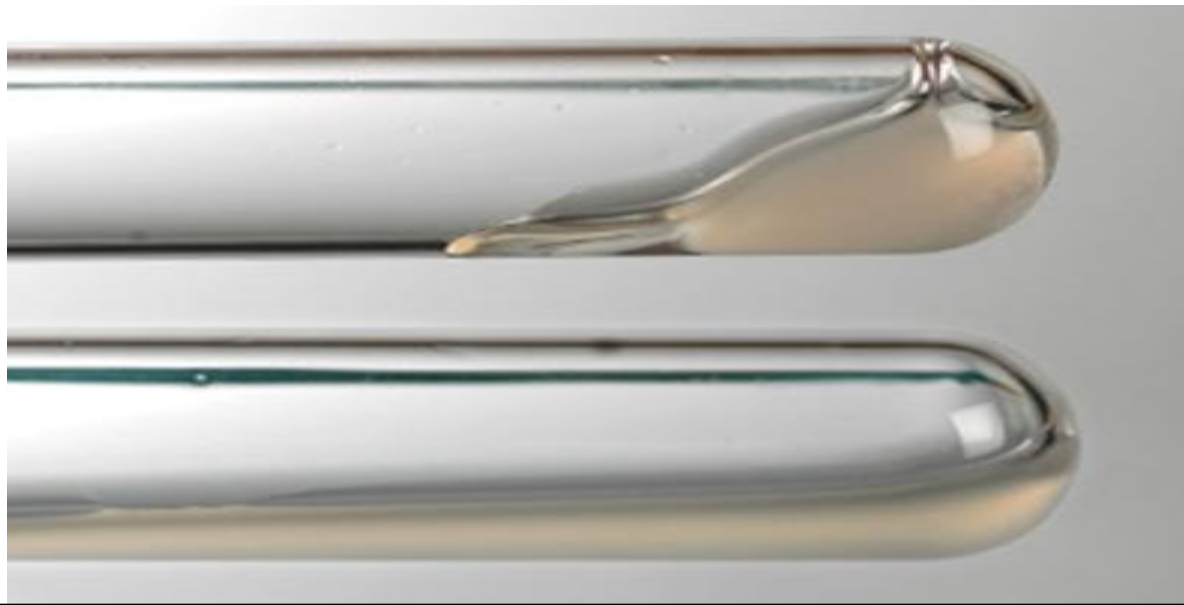
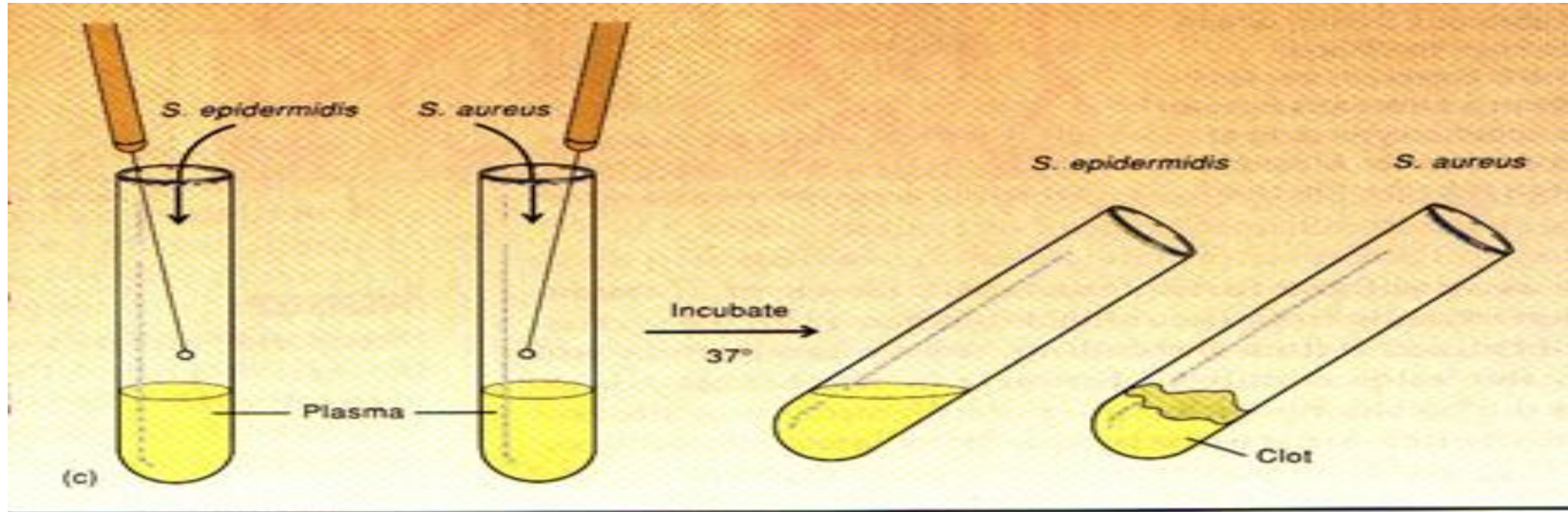


MSA

Mannitol salt agar media



Coagulase test



Streptococcus



α -hemolytic

green,
partial hemolysis

pneumoniae

optochin sensitive,
bile soluble,
capsule =>
quellung +

Viridans

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

β -hemolytic

clear,
complete hemolysis

pyogenes

Group A,
bacitracin sensitive

agalactiae

Group B,
bacitracin resistant

γ -hemolytic

no hemolysis

Enterococcus

E. faecalis,
E. faecium

Hemolysis on sheep blood agar

Blood Agar:

Shows three types of hemolysis

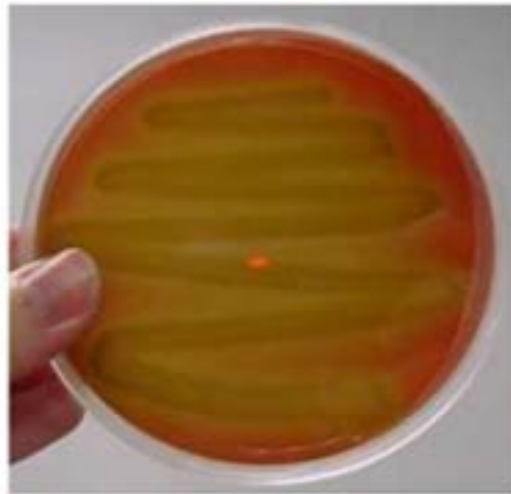
α Hemolysis

β Hemolysis

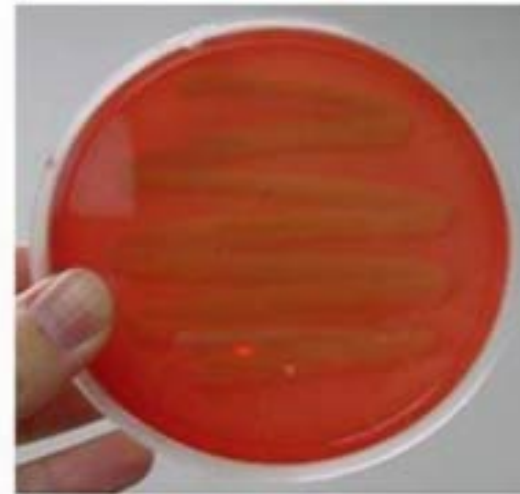
γ Hemolysis



Beta Hemolysis



Alpha Hemolysis

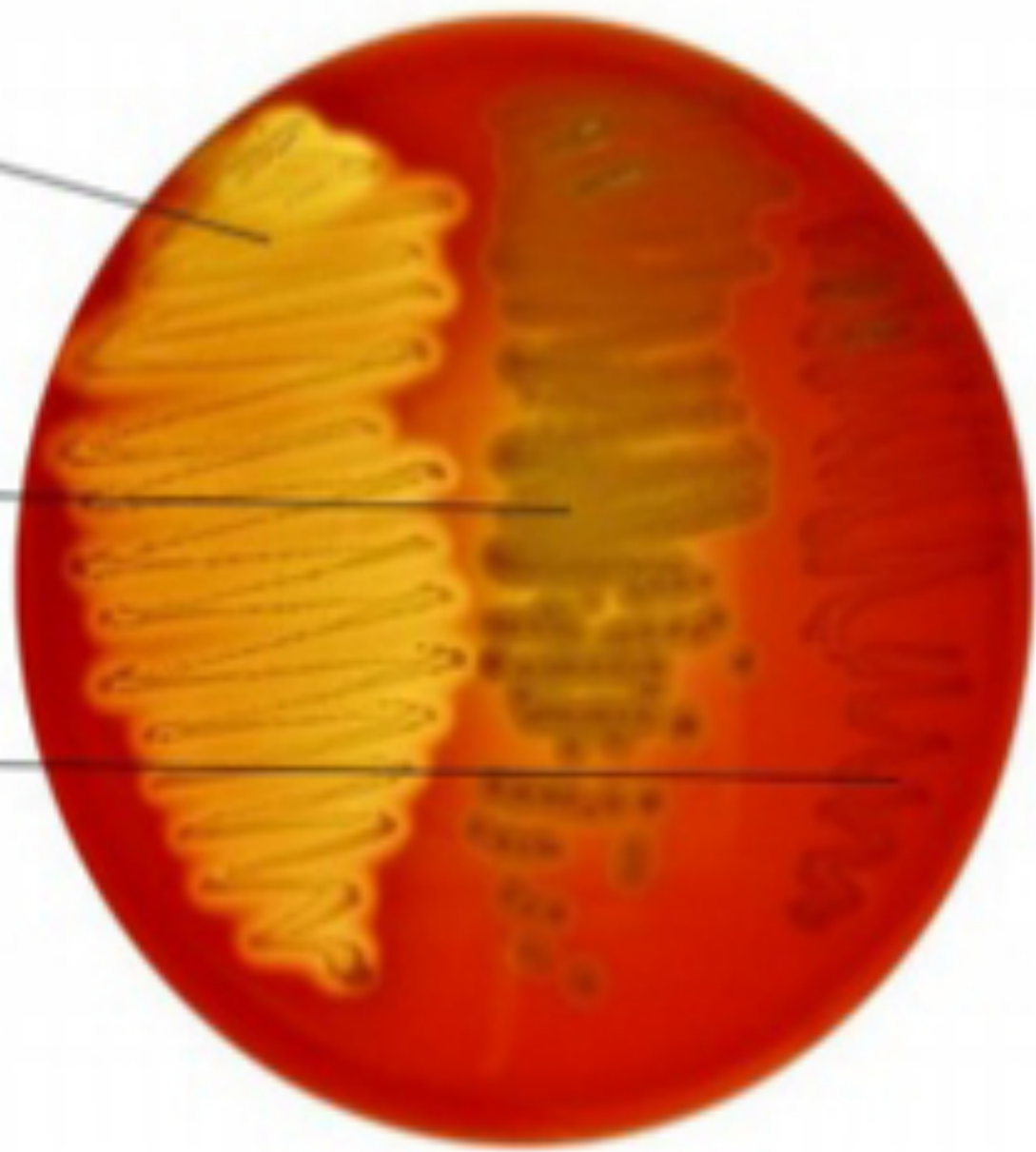


Gamma Hemolysis

Beta

Alpha

None

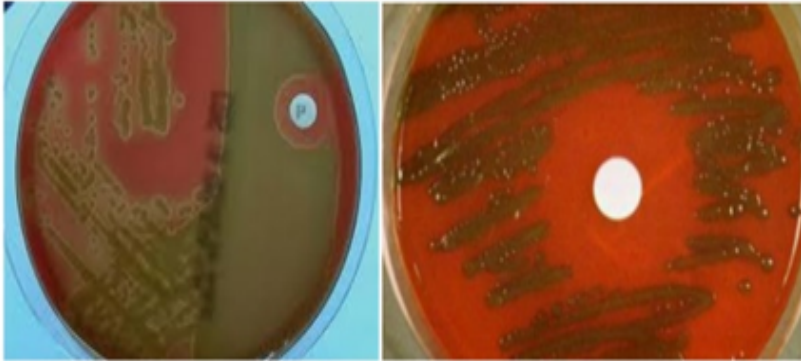


Differentiation between α -hemolytic streptococci

	Hemolysis	Optochin sensitivity
<i>S. pneumoniae</i>	α	Sensitive (≥ 14 mm)
<i>Viridans strep</i>	α	Resistant (≤ 13 mm)



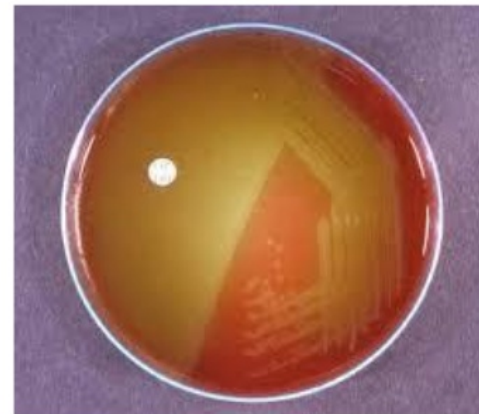
Optochin test *Streptococcus pneumoniae*



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)



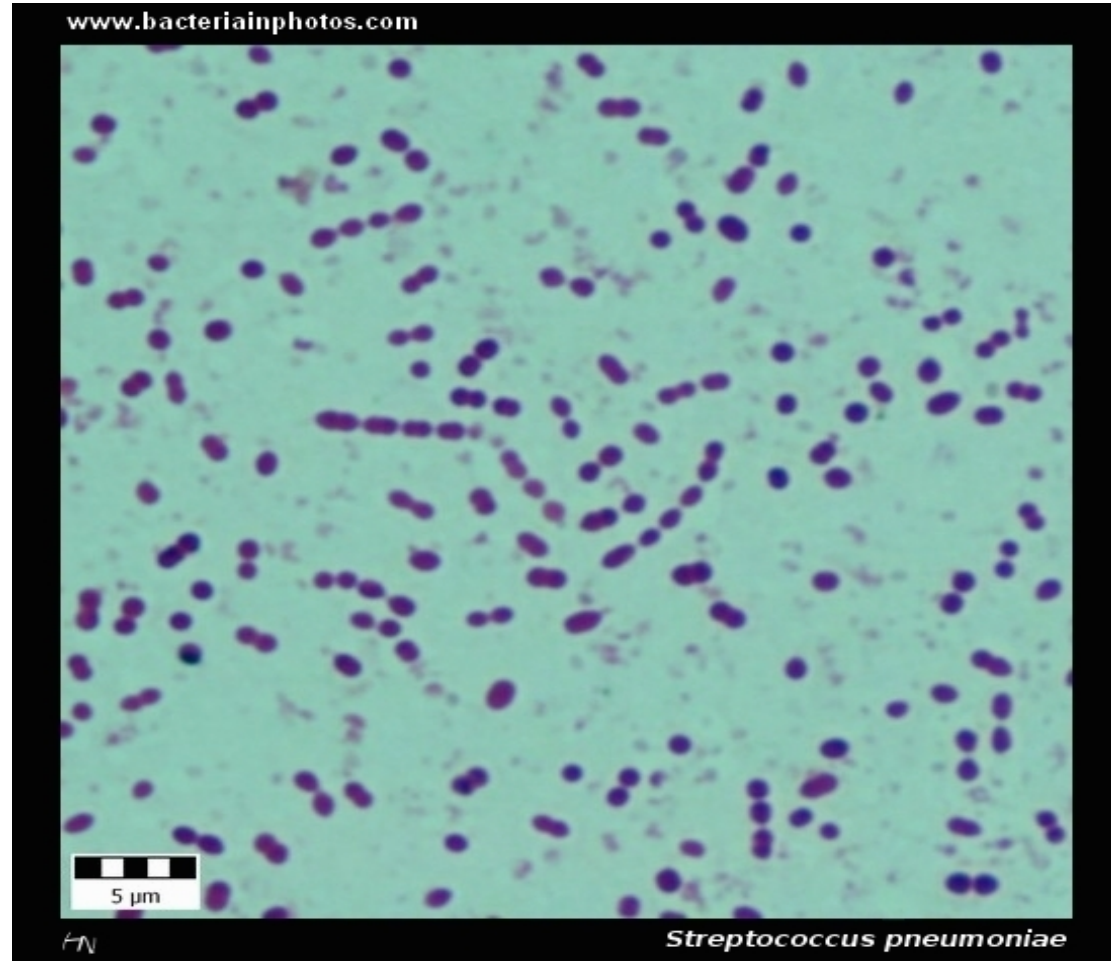
Optochin test *Streptococcus viridans*



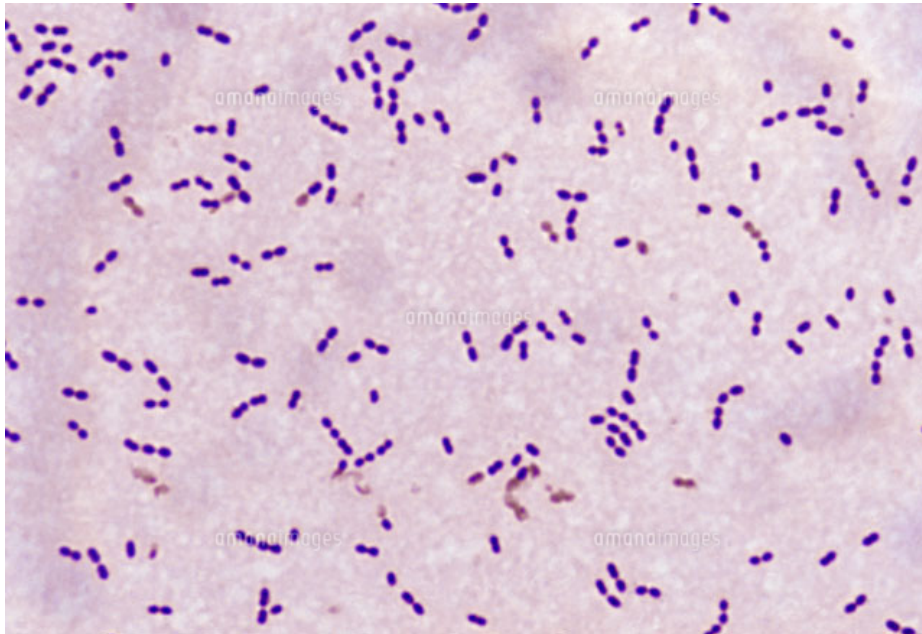
Streptococcus viridans strain on blood agar showing alpha hemolysis (green zone surrounding colonies). **No zone of growth inhibition (Resistant)** around a filter paper disc impregnated with optochin.

Streptococcus pneumoniae

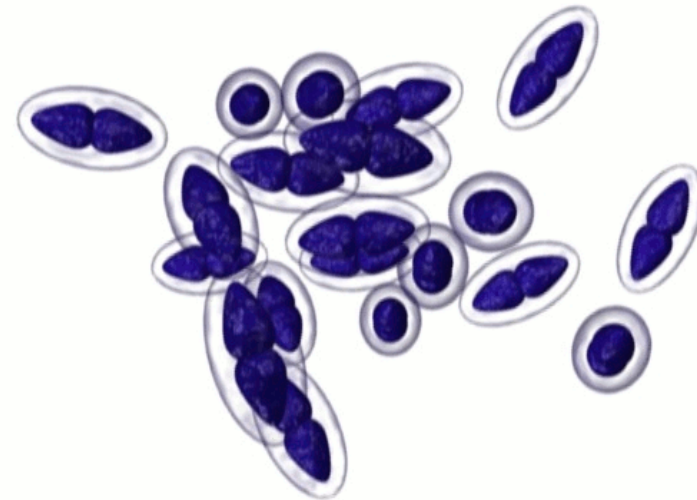
- Gram +ve cocci
- **Short chain**
- Commonly in pairs
- **Lancet shape**



Streptococcus pneumoniae



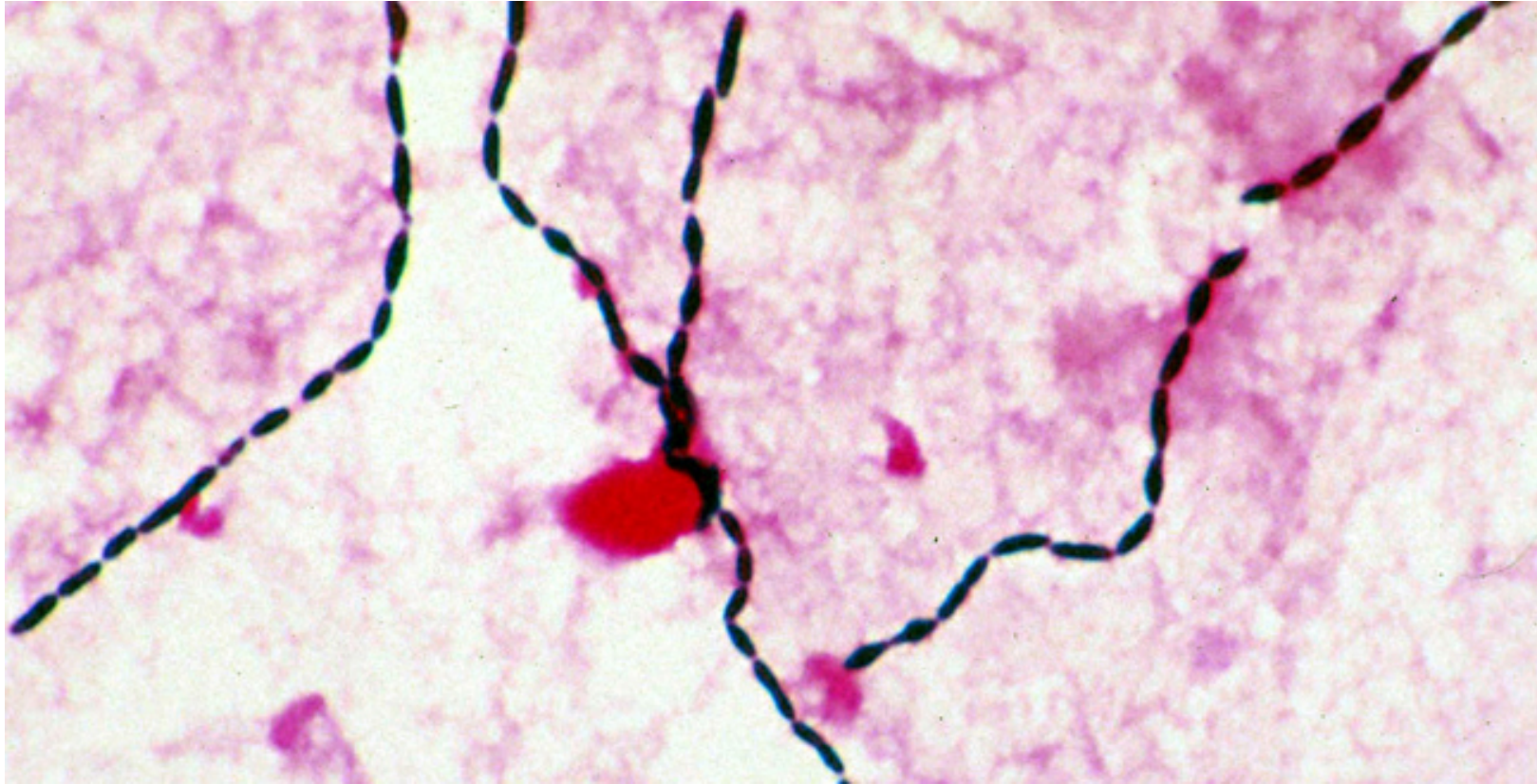
www.bacteria.cz



Han et al.

Streptococcus pneumoniae

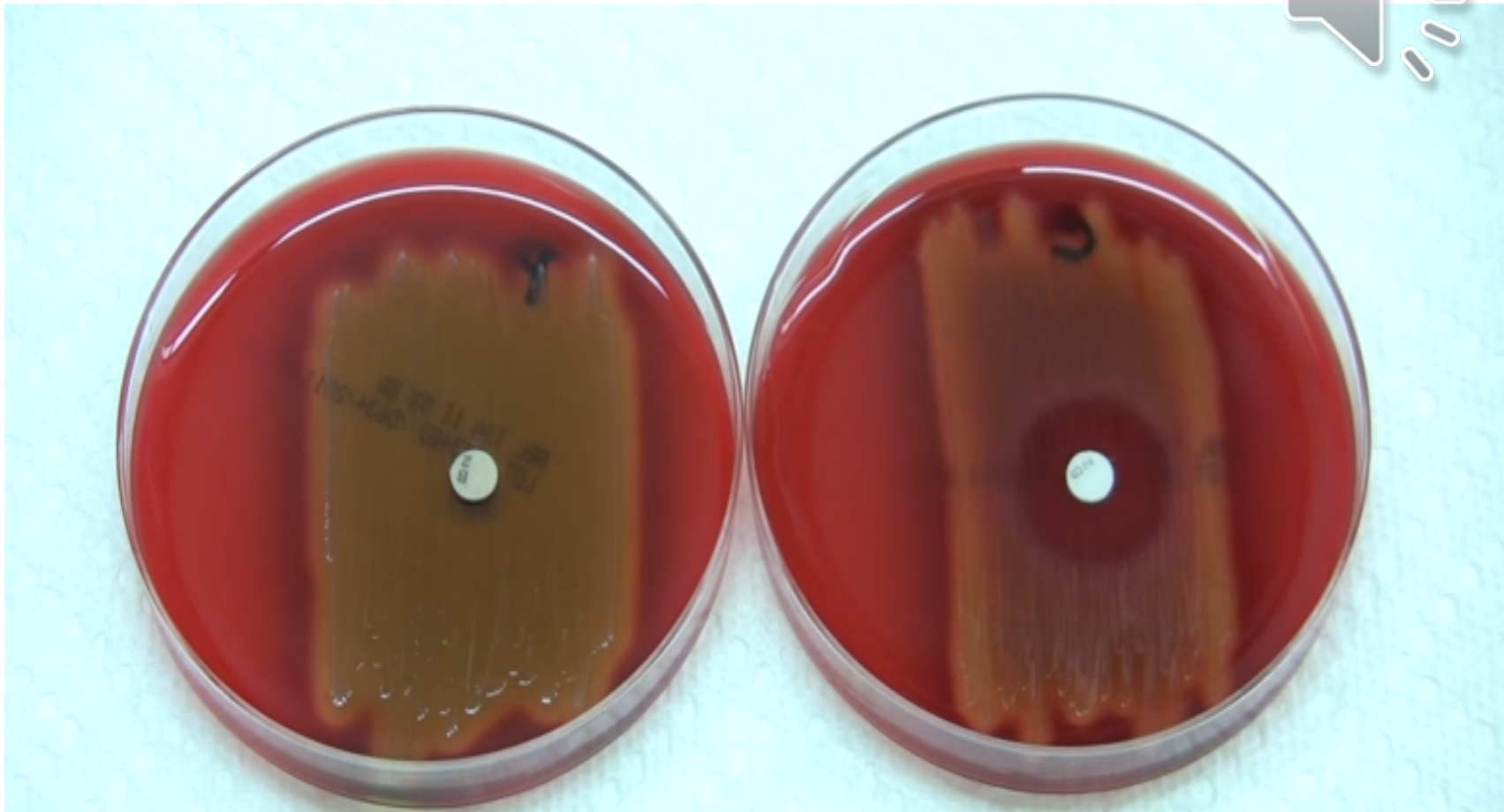
Streptococcus viridans



Differentiation between β -hemolytic streptococci

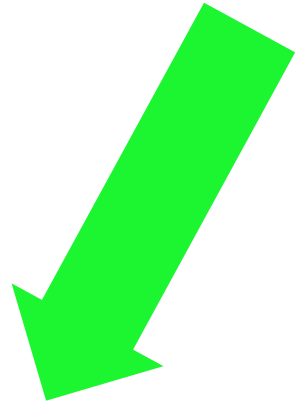
	Hemolysis	Bacitracin sensitivity
<i>S. pyogenes</i>	β	Susceptible
<i>S. agalactiae</i>	β	Resistant





Bacitracin test for *Streptococcus pyogenes*

**Gamma hemolysis
streptococcus**



**Enterococcus
Group D
- E.feacalis**



**Other than
Enterococcus
group D**



Bile-Esculin

Other than
Enterococcus
Group D
Negative



**Enterococcus
Group D
Positive**

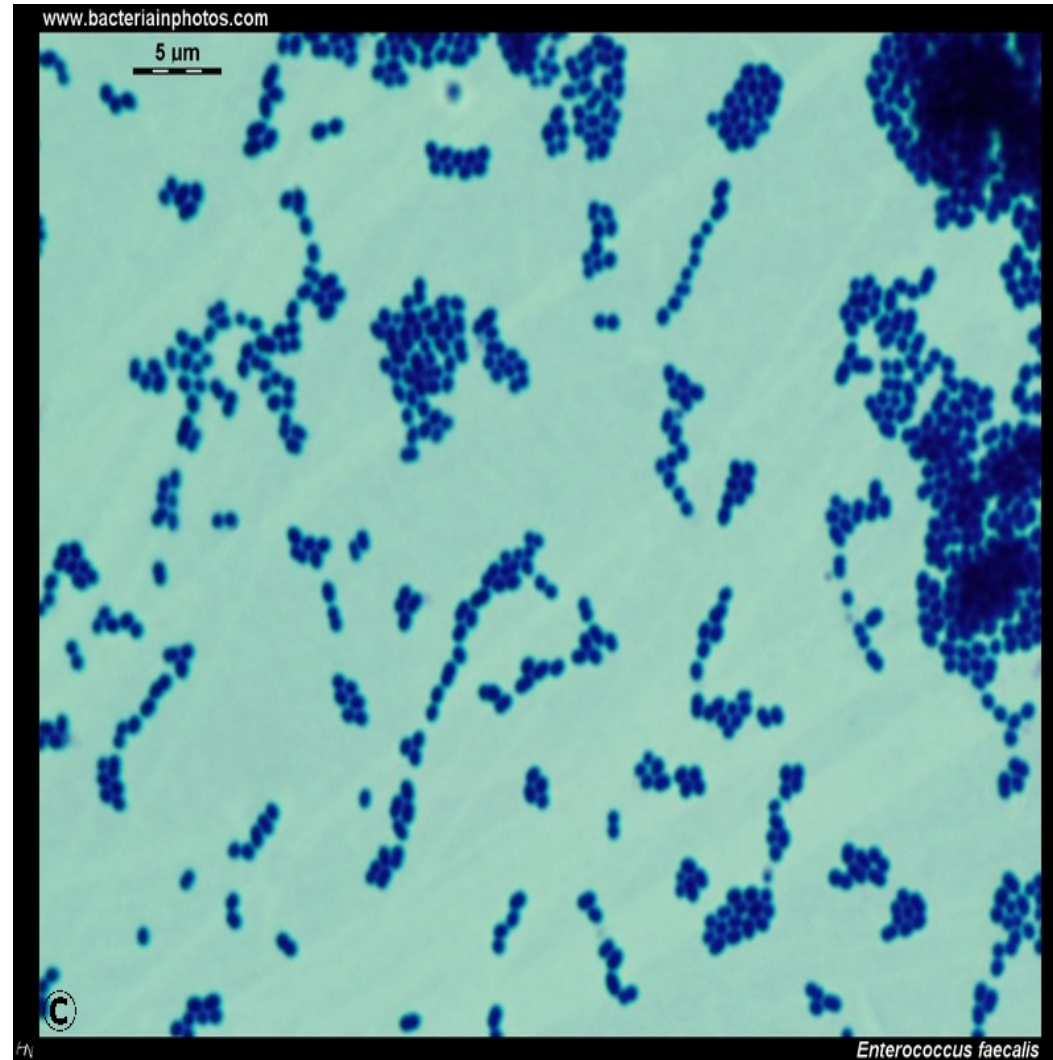




Enterococcus

- Gram positive cocci

- Short chain
- Diplococcus



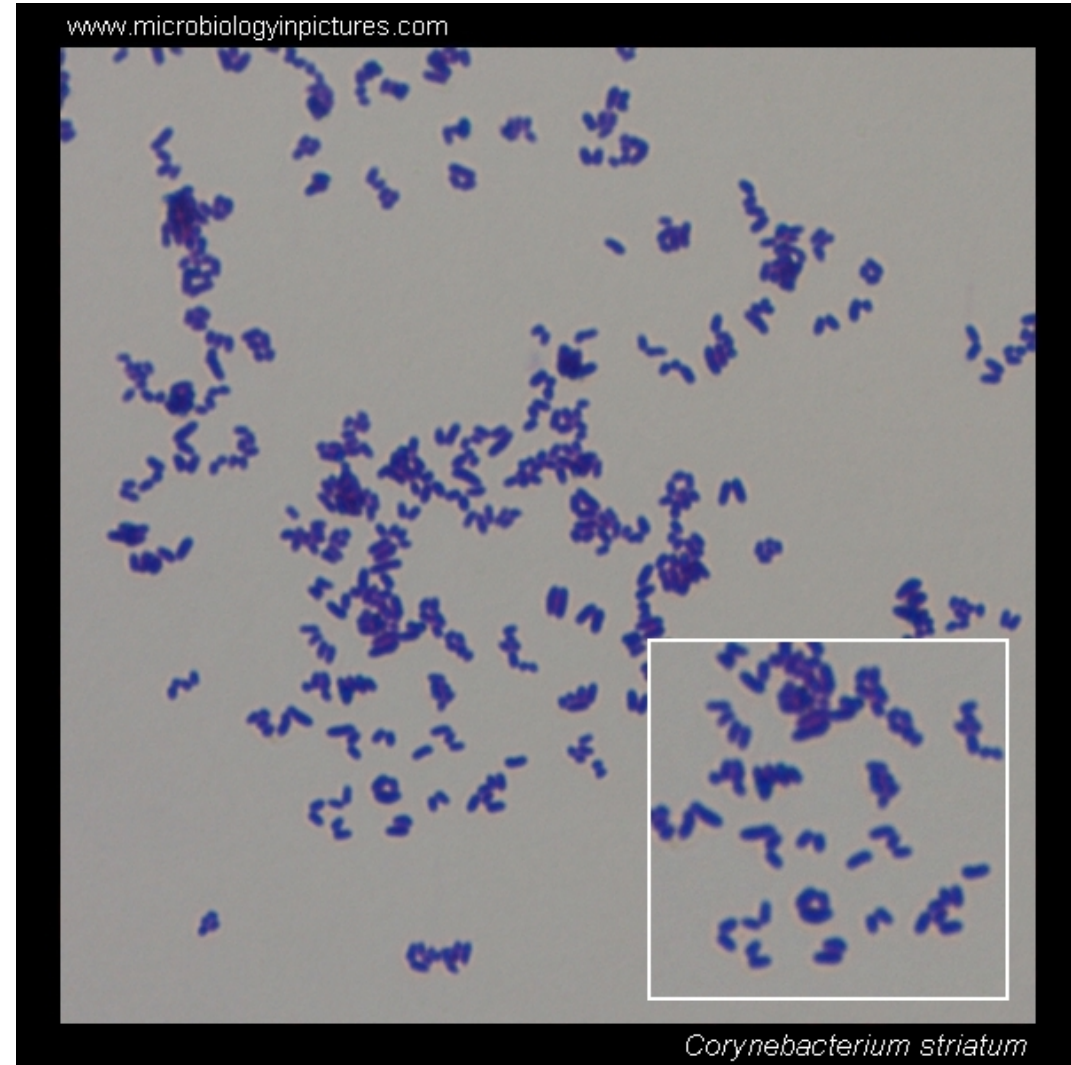
Diphtheroids

Gram Positive
Cocco-bacilli

Arrangement as
Chinese letter



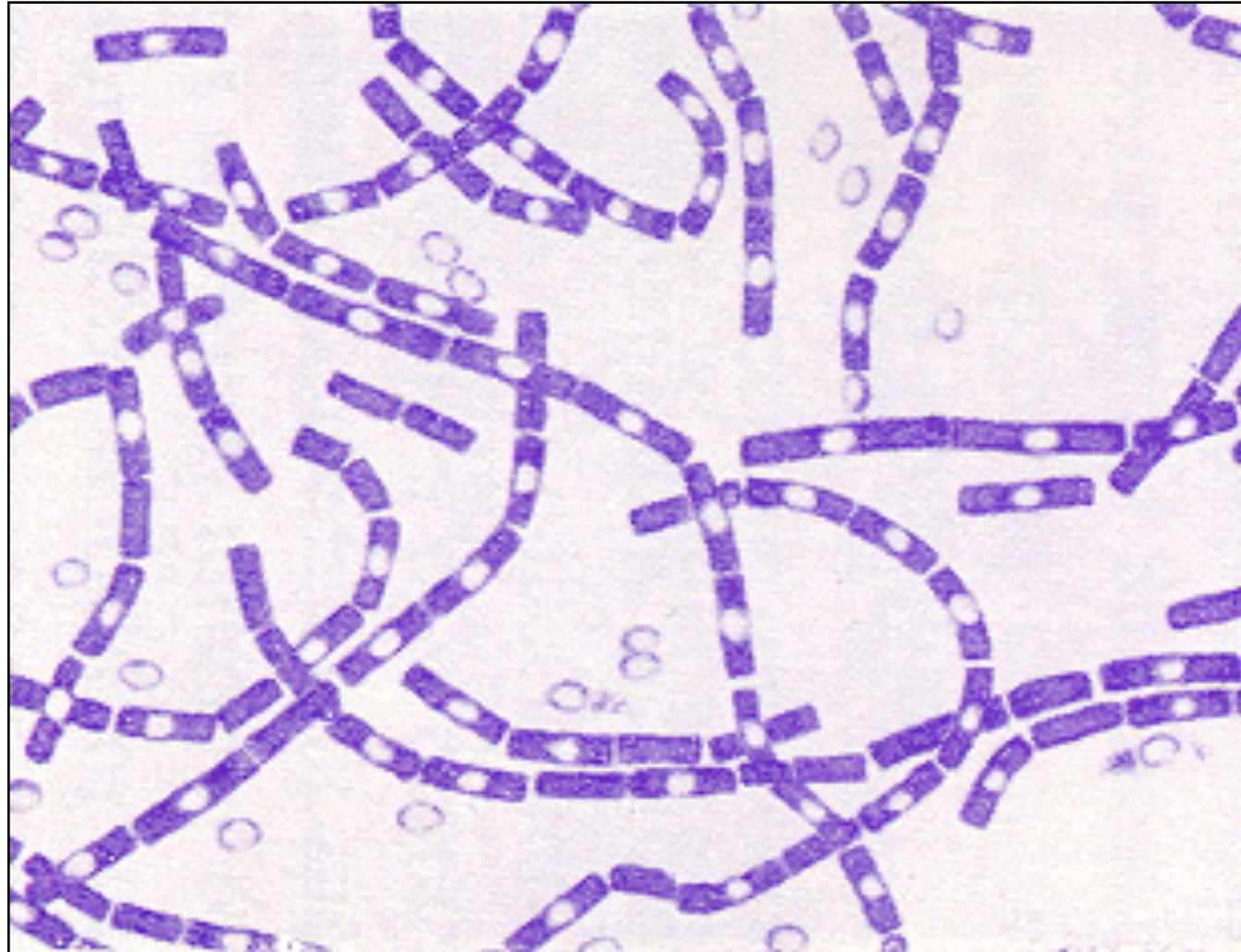
文学家



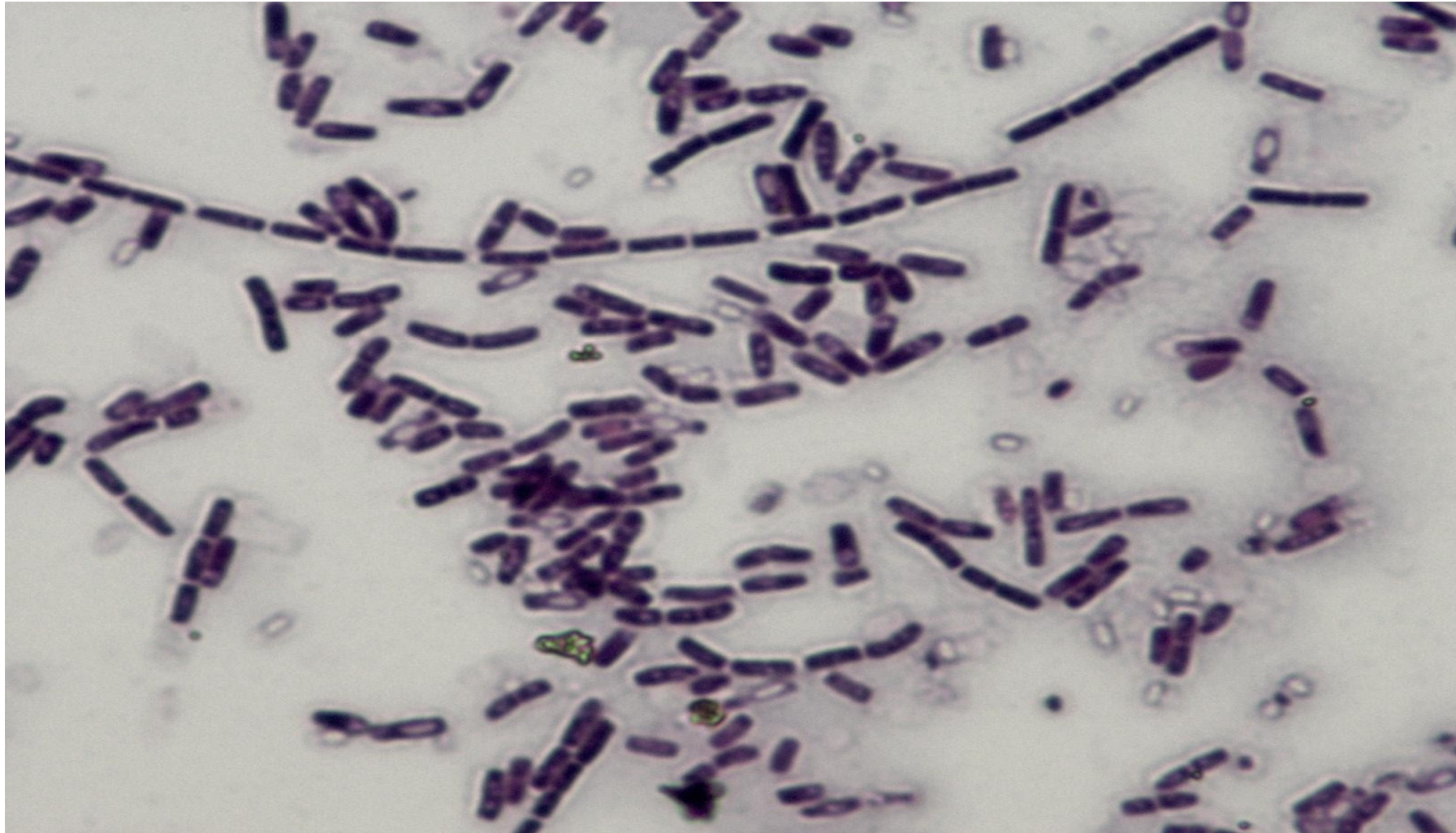
Bacillus Spp.



Bacillus Spp.



Bacillus cereus





**Thank you
Any Question ??**