Respiratory system

Microbiology laboratory section

THROAT SWAB

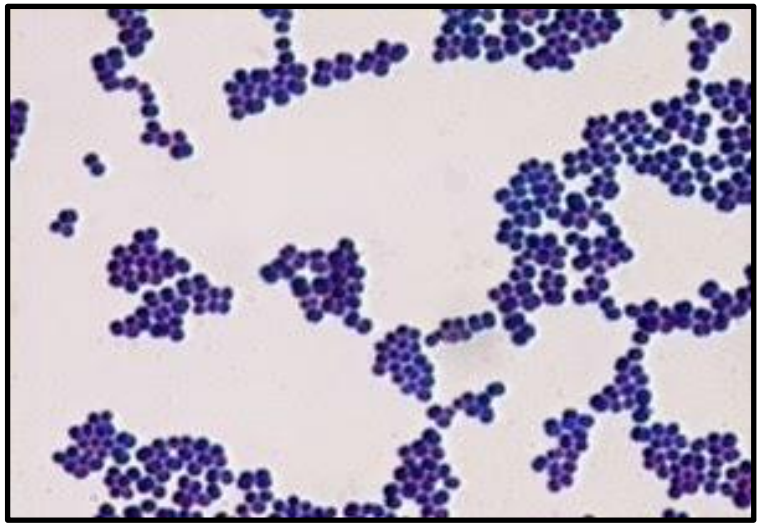
Gram Positive Coccus

Staphylococcus Spp.

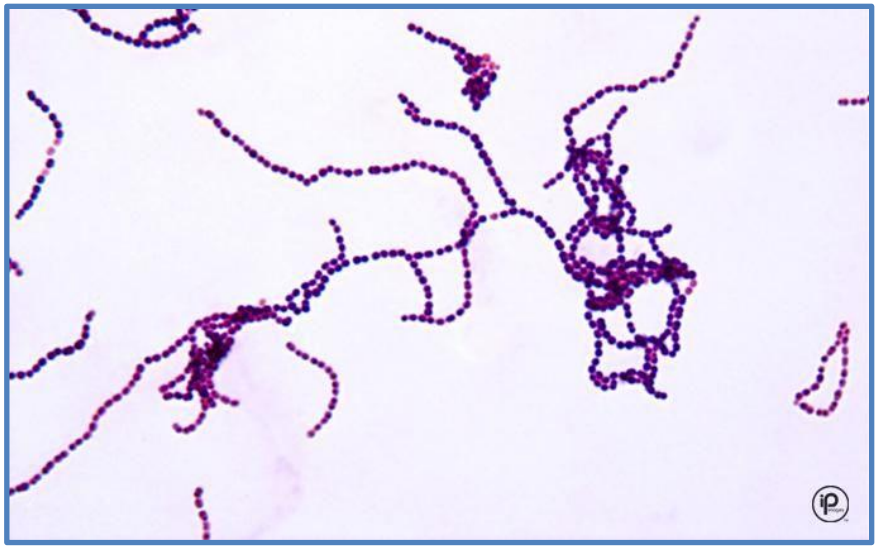
Streptococcus Spp.

GRAM STAIN

Staphylococcus



Streptococcus

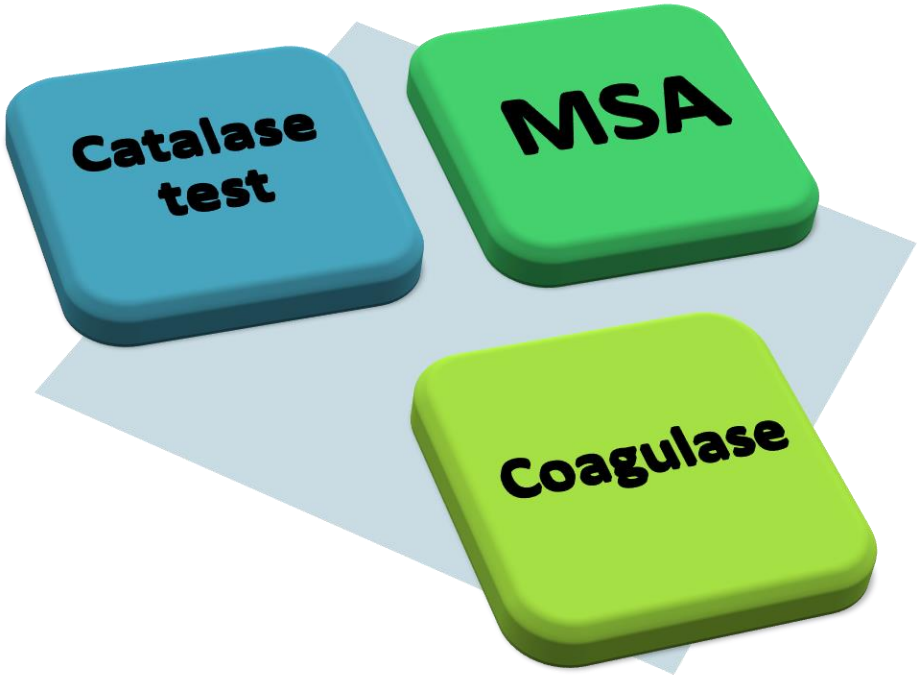


A- staphylococcus .albus

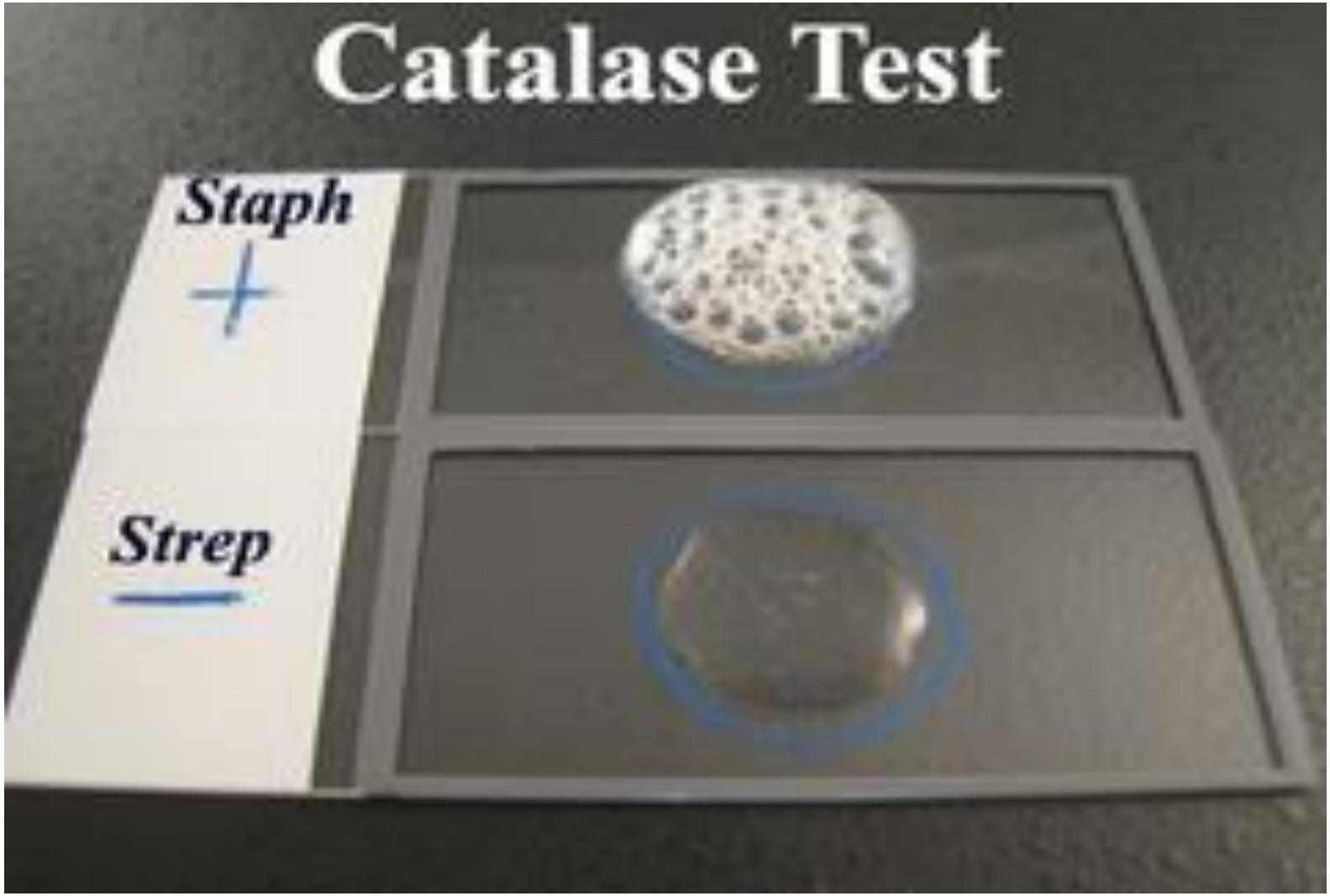
B- staphylococcus.Aureus

Blood agar

Test for differentiation of Staphylococcus species

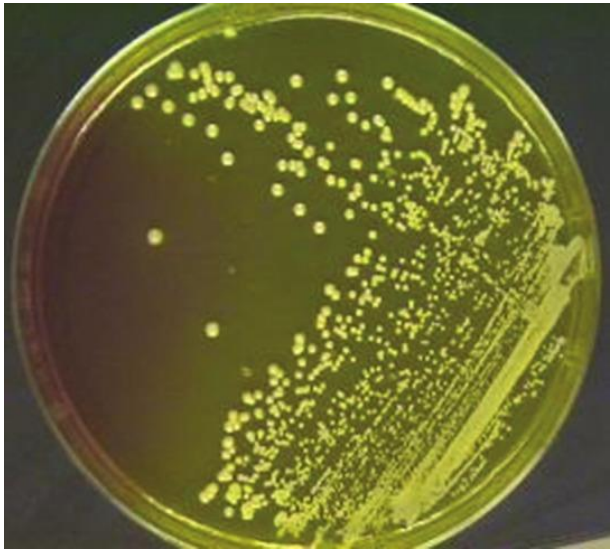


Catalase test

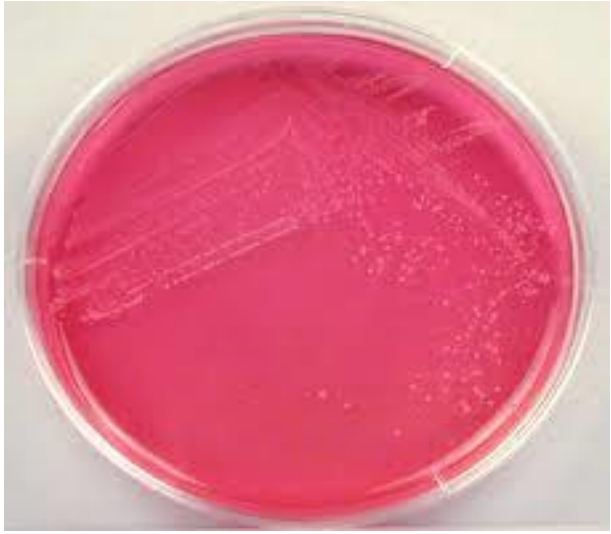


MSA
Mannitol salt agar media

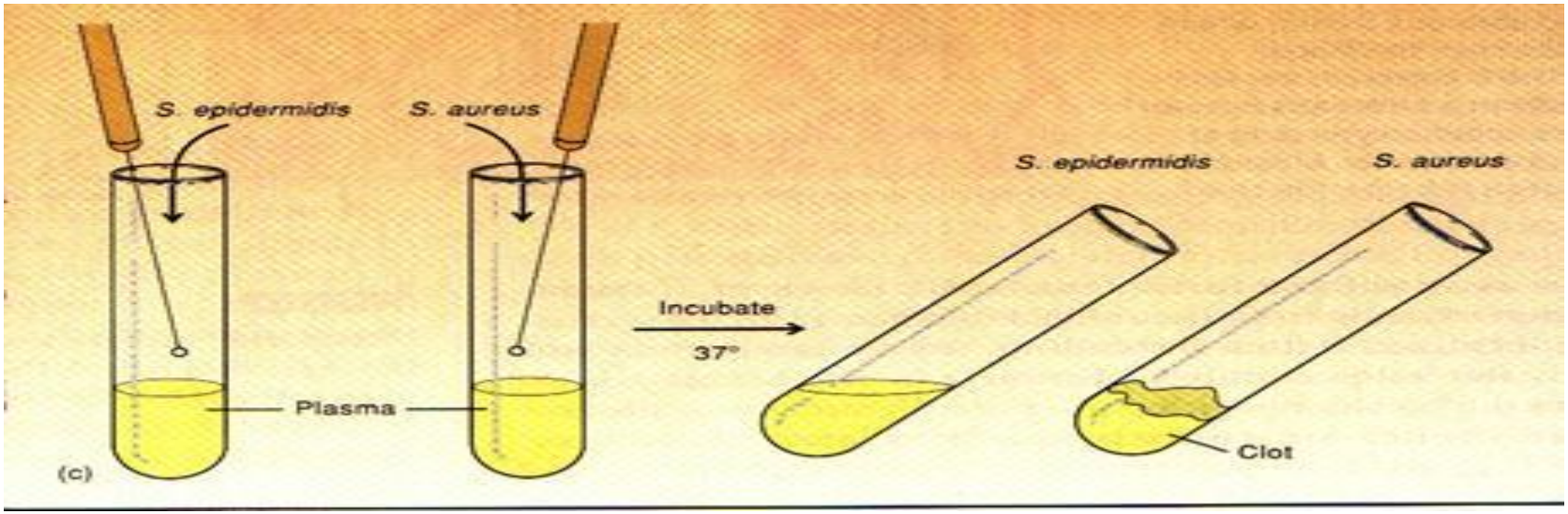
S.aureus

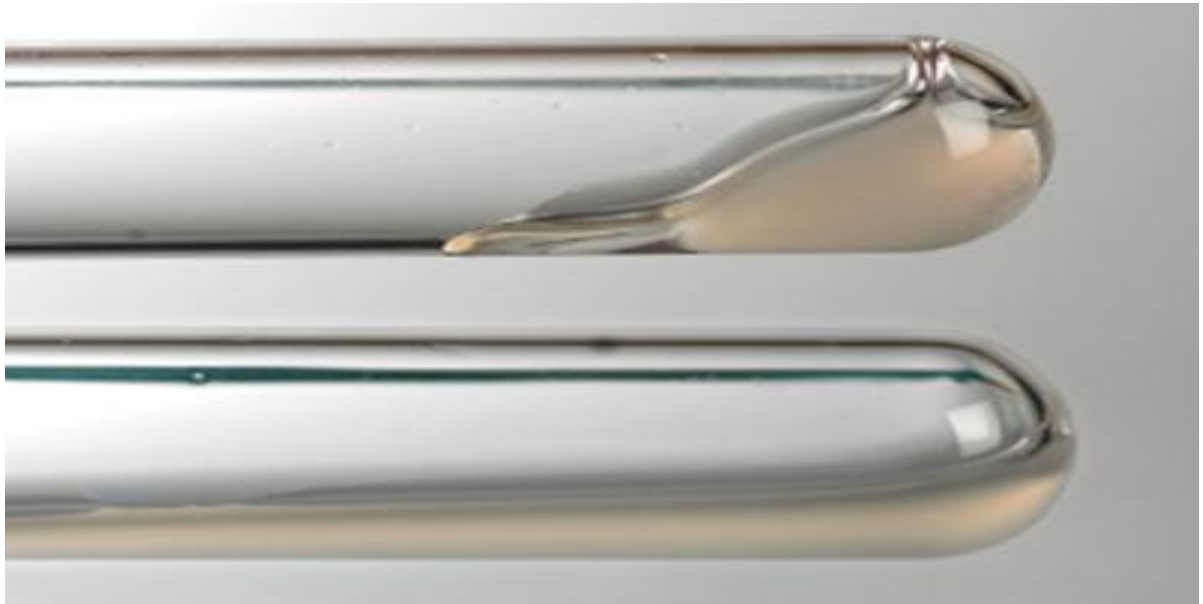


S.albus



Coagulase test





S.aureus

S.albus

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

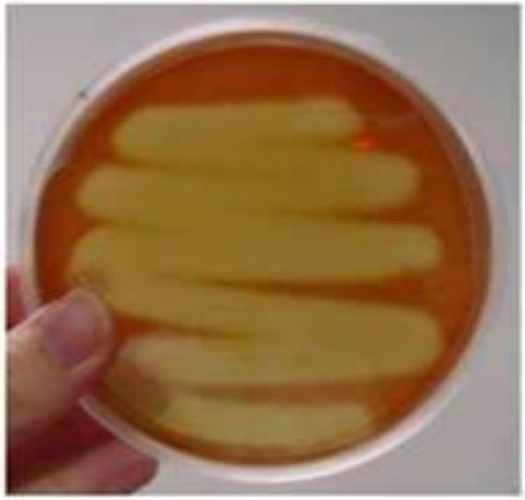
γ-hemolytic
no hemolysis

- **Enterococcus**
  E. faecalis,
  E. faecium

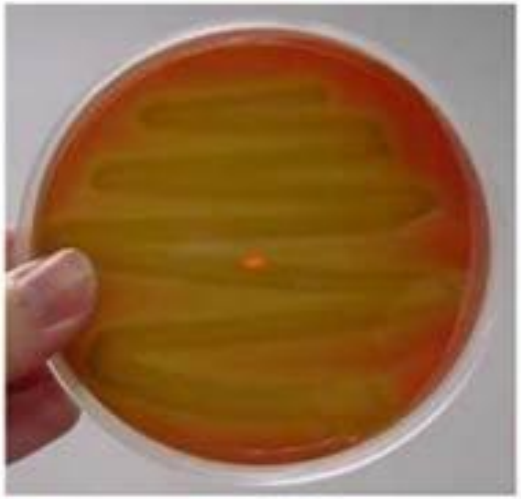
Hemolysis on sheep blood agar

Blood Agar:

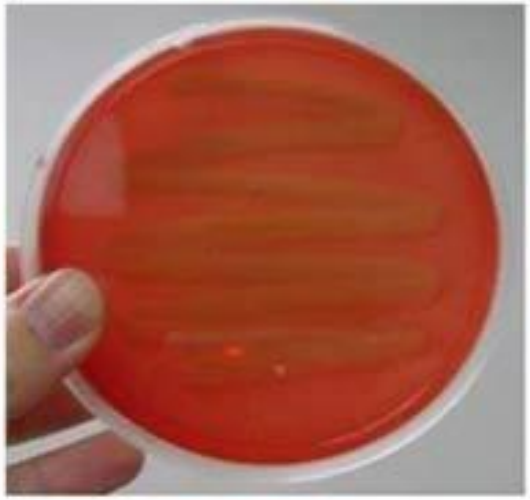
- Shows three types of hemolysis
- α Hemolysis
- β Hemolysis
- γ Hemolysis



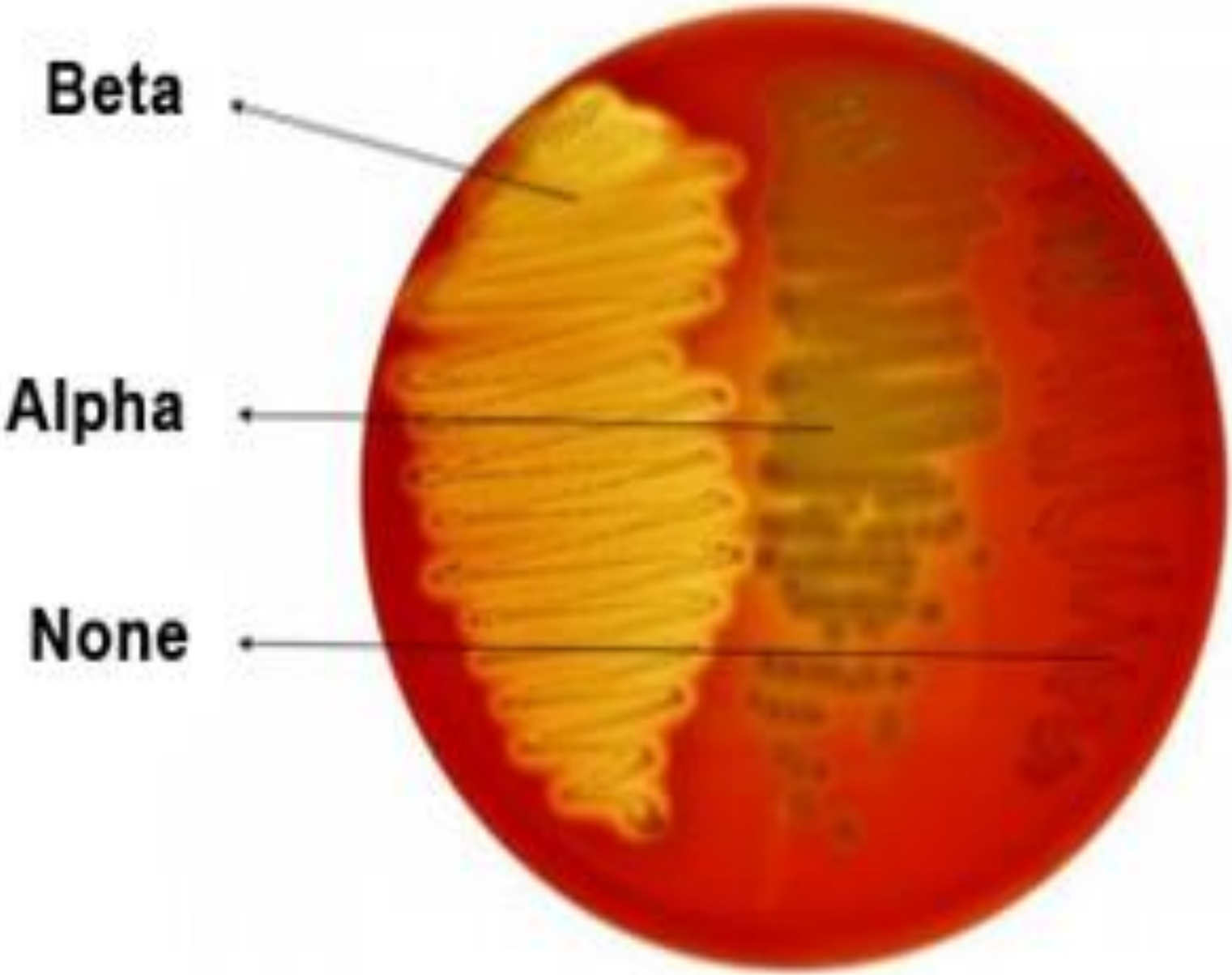
Beta Hemolysis



Alpha Hemolysis



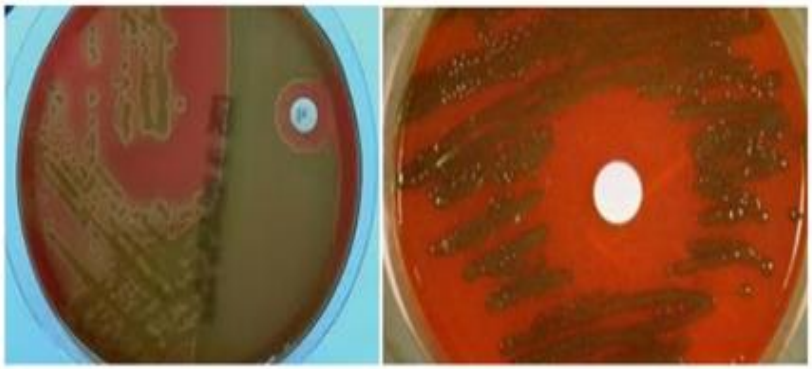
Gamma Hemolysis


Beta
Alpha
None

Differentiation between α-hemolytic streptococci

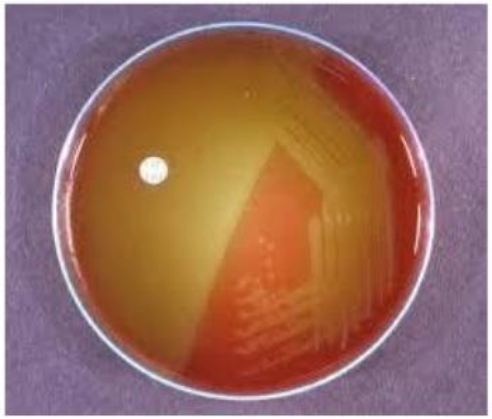
	Hemolysis	Optochin sensitivity
S. pneumoniae	α	Sensitive (≥ 14 mm)
Viridans strep	α	Resistant (≤13 mm)

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)

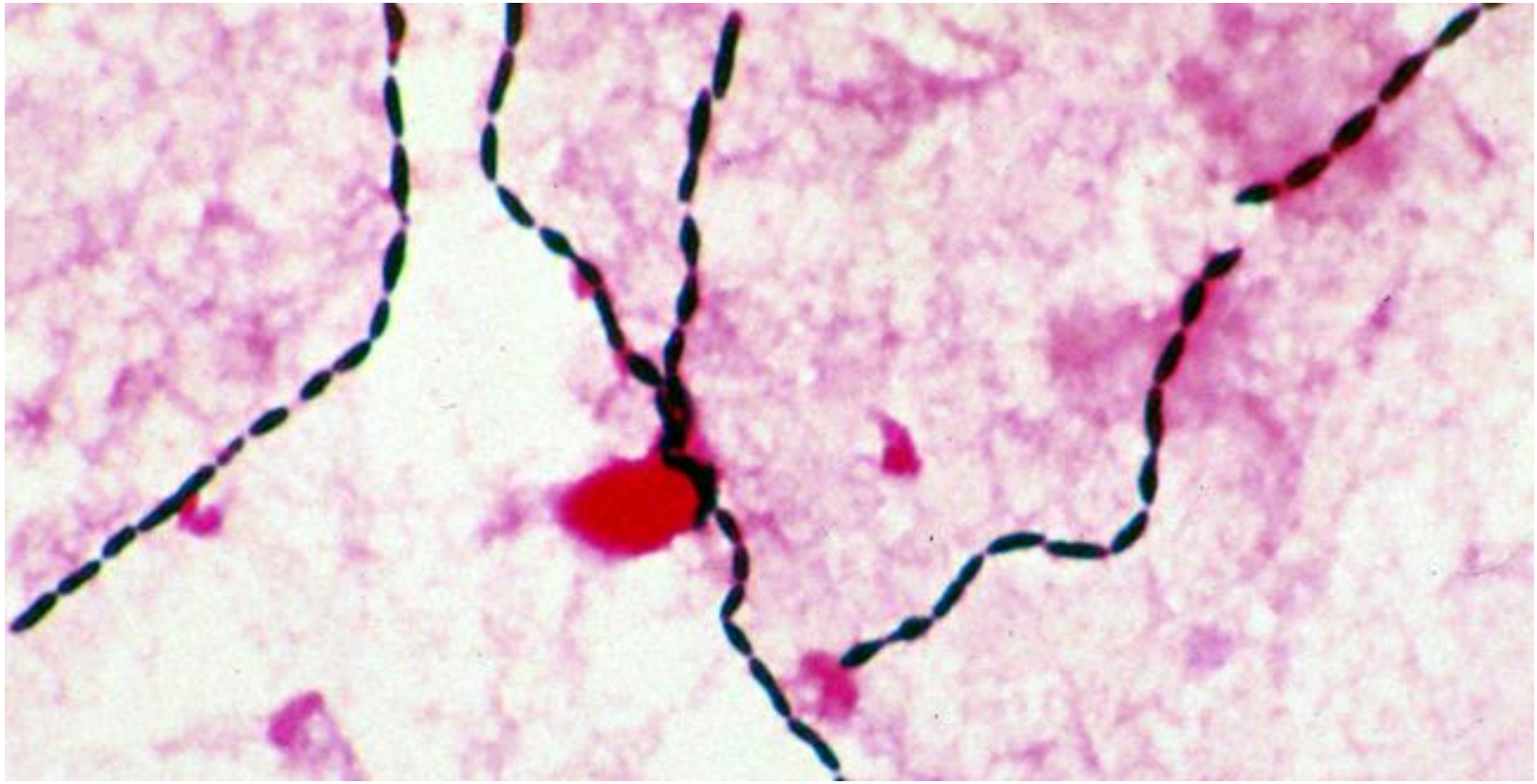
Optochin test
Streptococcus viridans



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

Streptococcus viridans



Differentiation between β-hemolytic streptococci

	Hemolysis	Bacitracin sensitivity
S. pyogenes	β	Susceptible
S. agalactiae	β	Resistant

Bacitracin test for *Streptococcus pyogenes*

Gamma hemolysis streptococcus

Enterococcus Group D

- E.feacalis

Other than Enterococcus group D

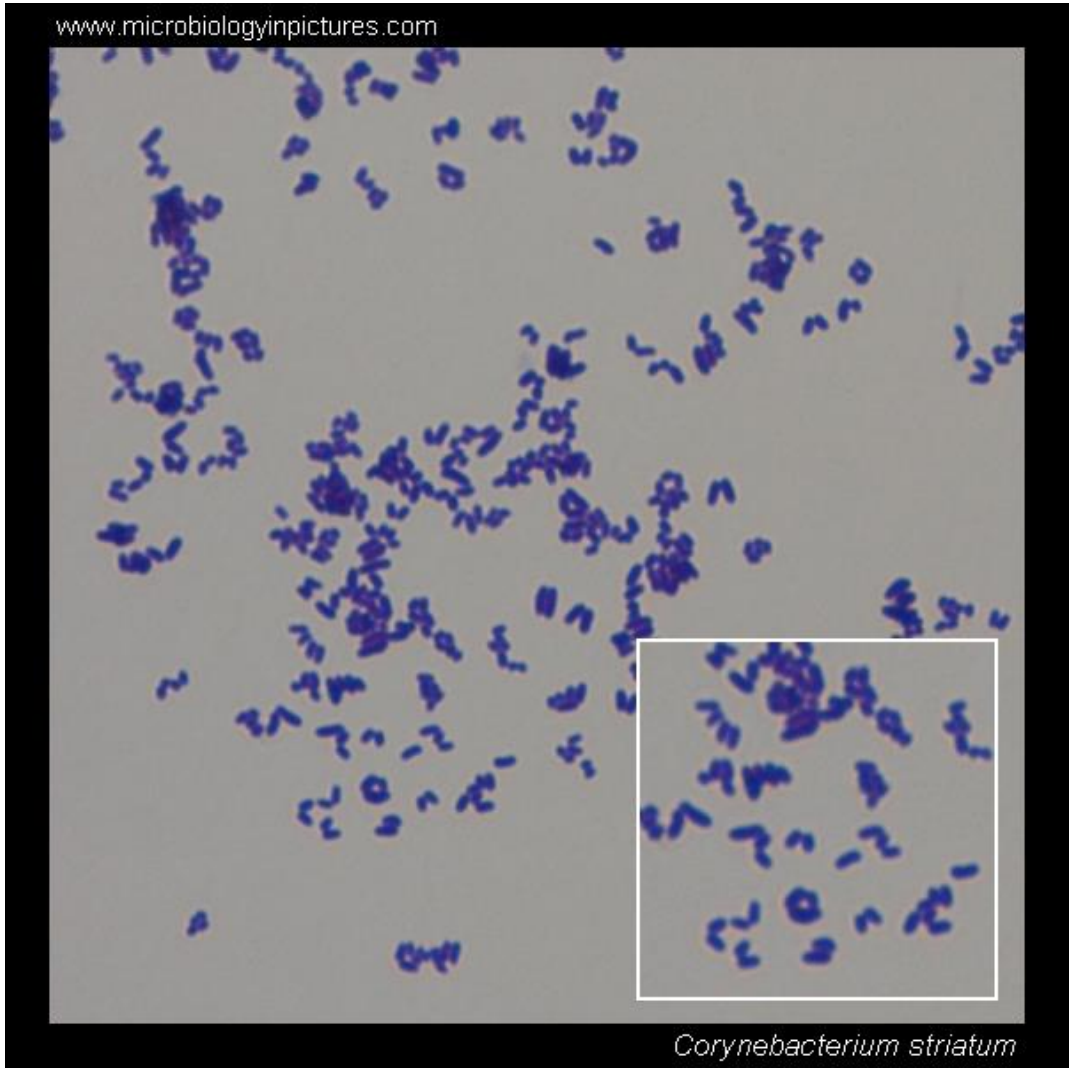
Bile-Esculin

Diphtheroids

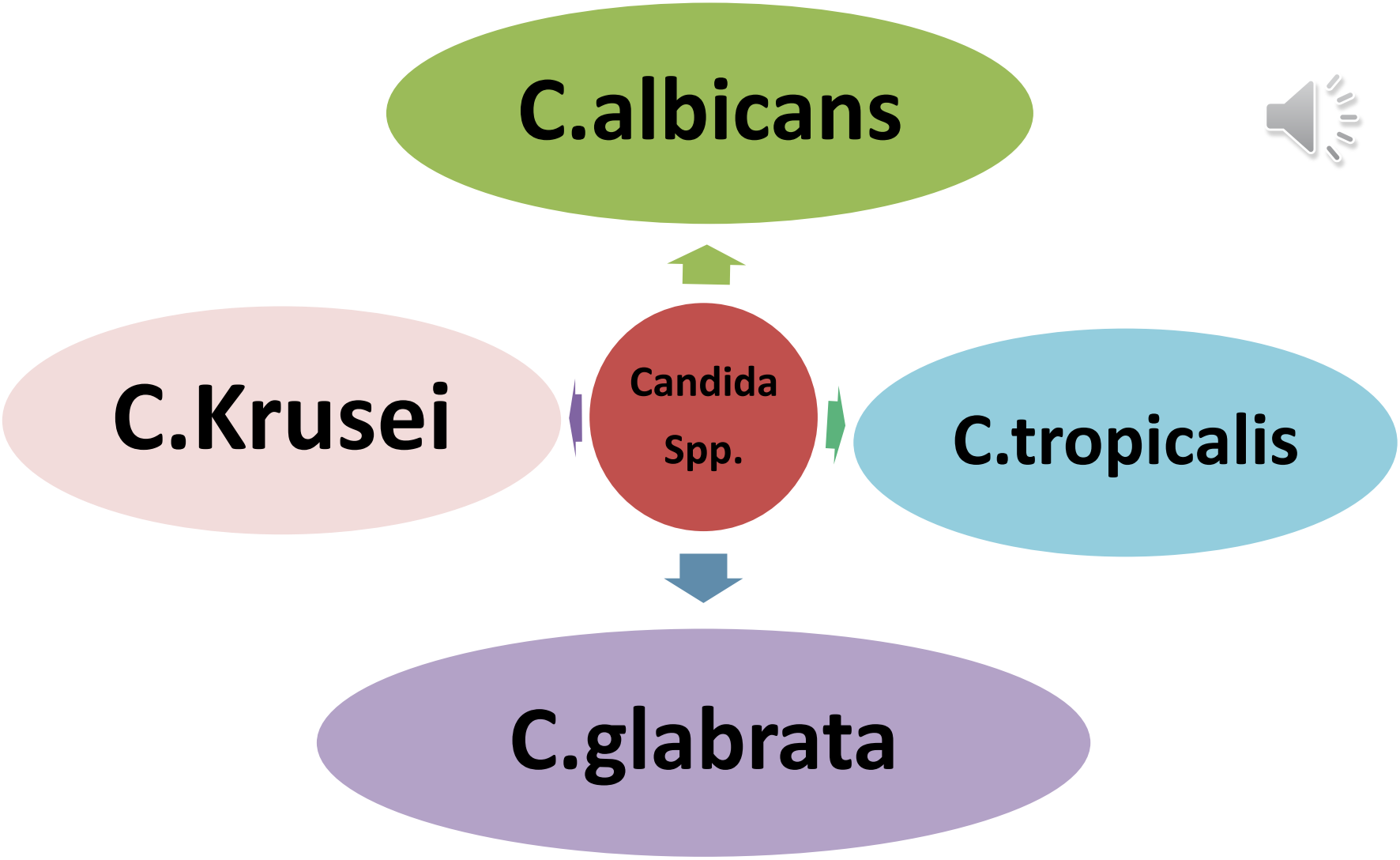
Gram Positive
Cocco-bacilli

Arrangement as
Chinese letter

文学家

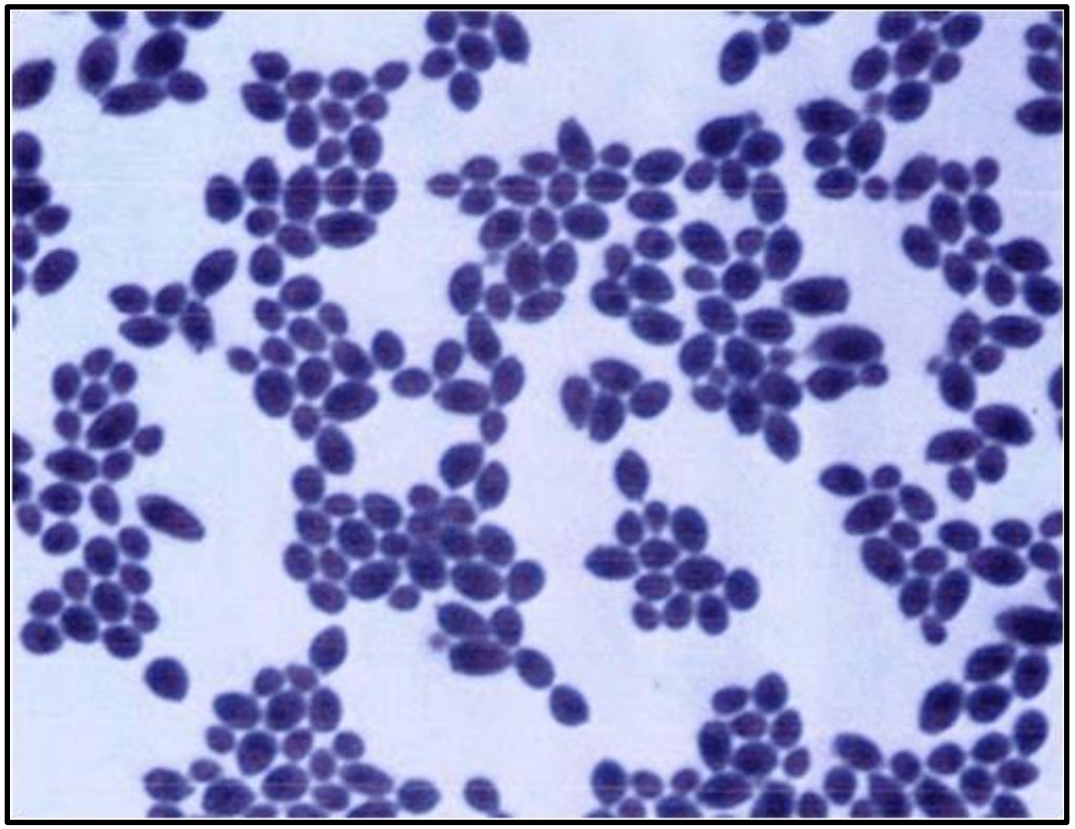


Candida Species

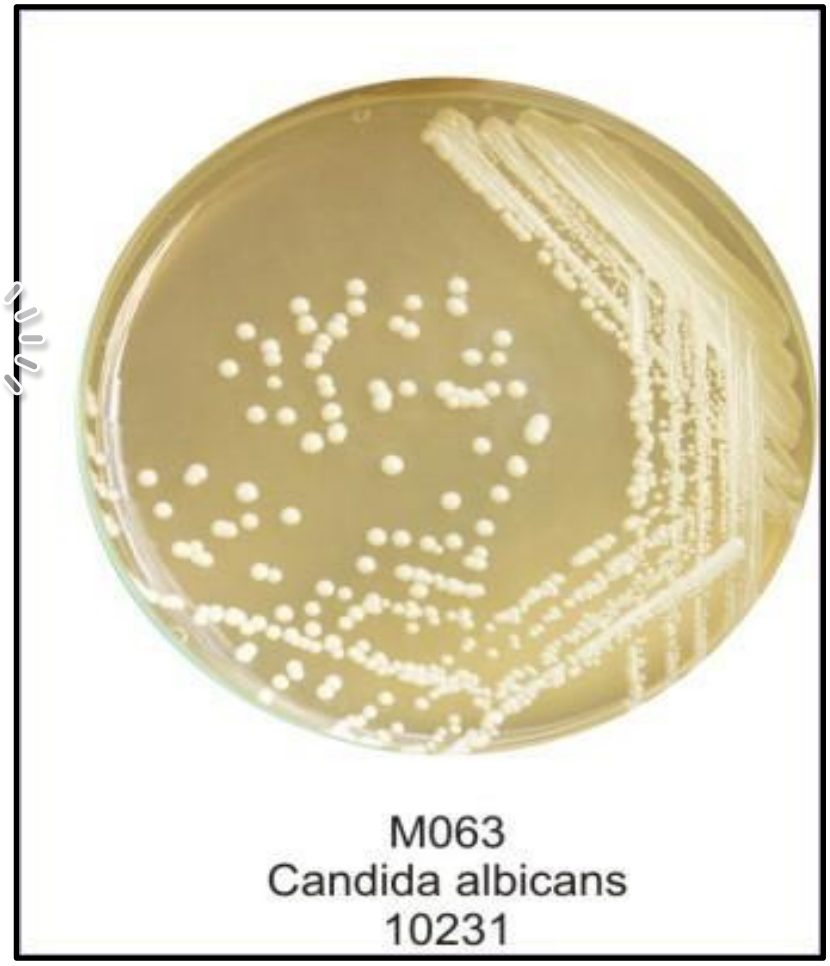


Candida Spp

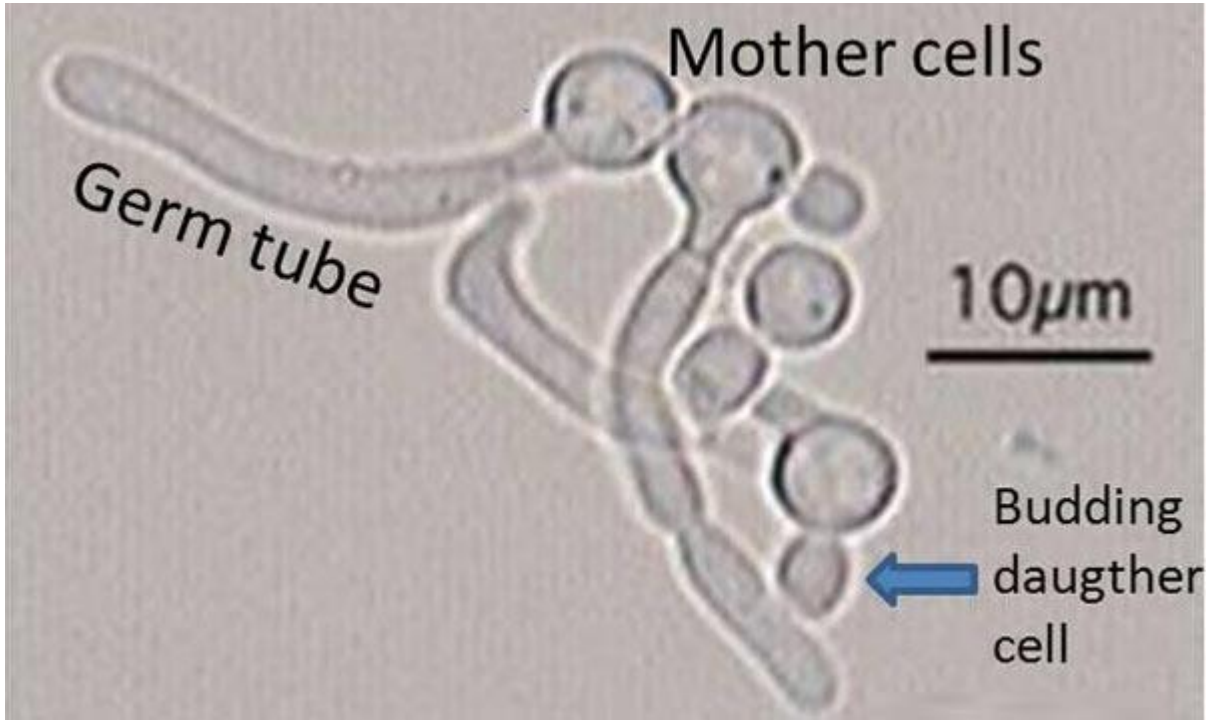
- Larger than Bacteria
- Budding



sabouraud dextrose agar



To Differentiate between C.albican and other Species



Germ tube

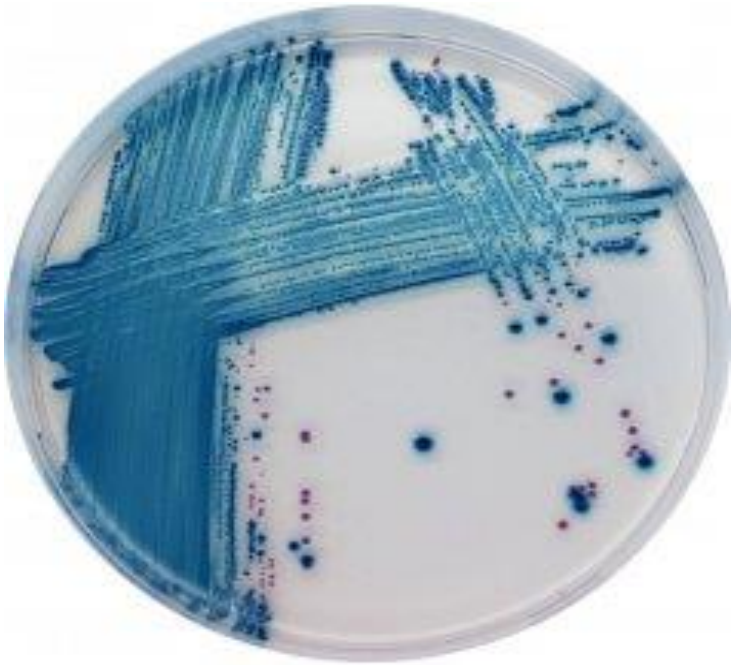
[Serum + candida]

Chrom agar

C.glabrata : violet (dark pink) glistering

C.albicans : Green

Chrom agar

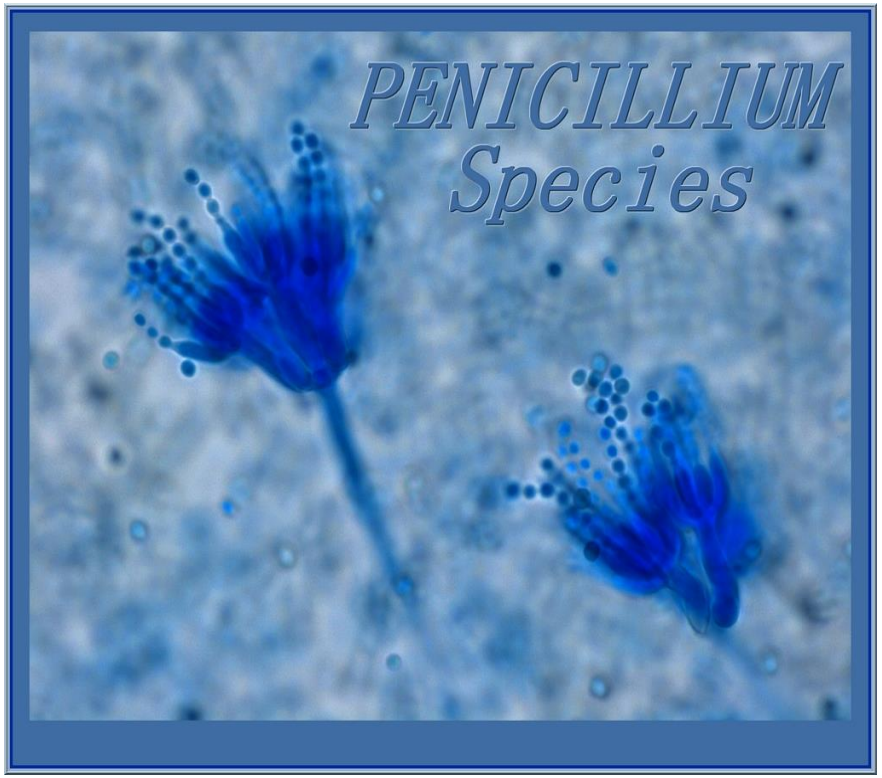


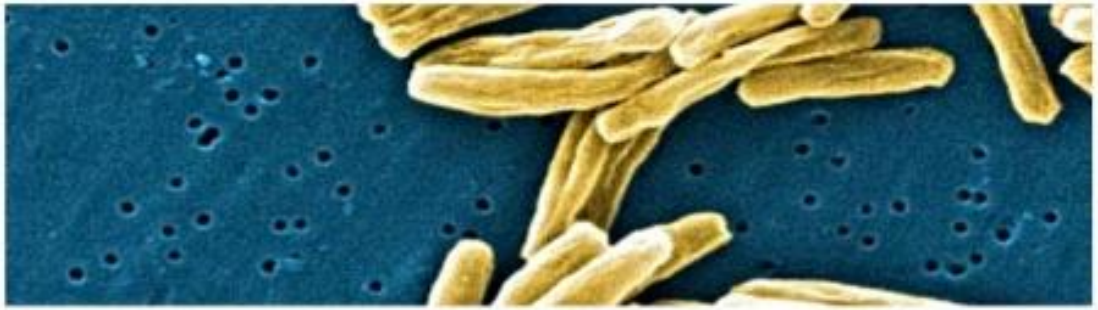
C.Krusei : rough dry pale pink

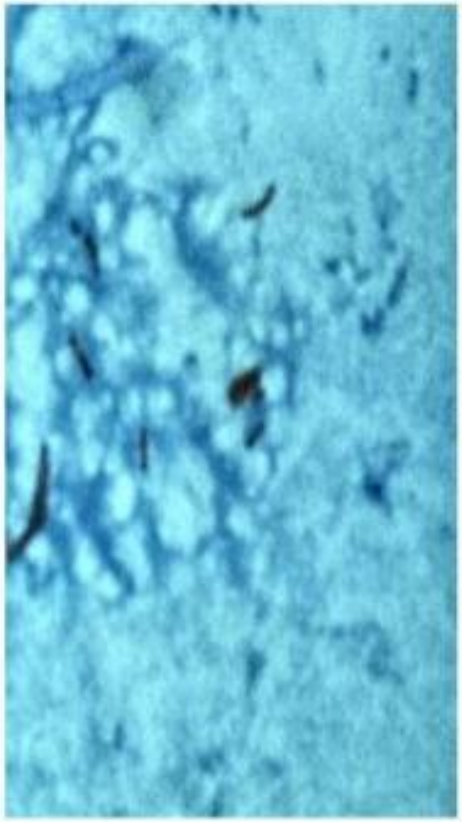
C.Tropicalis Blue

Aspergillus Niger

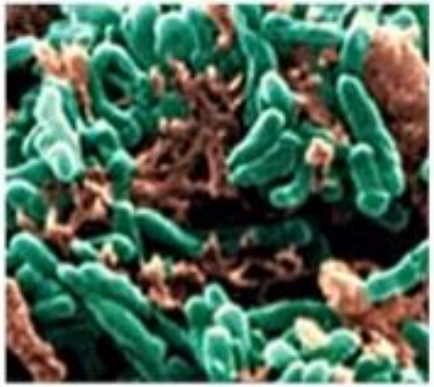
Penicillium Spp.

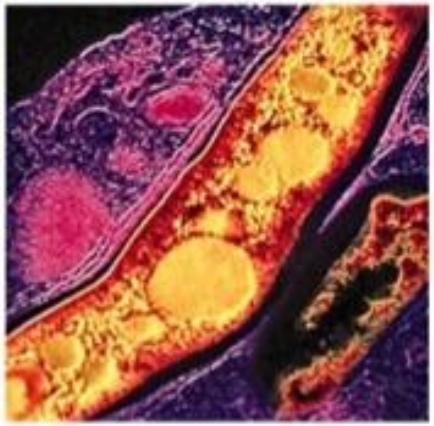






MYCOBACTERIUM TUBERCULOSIS





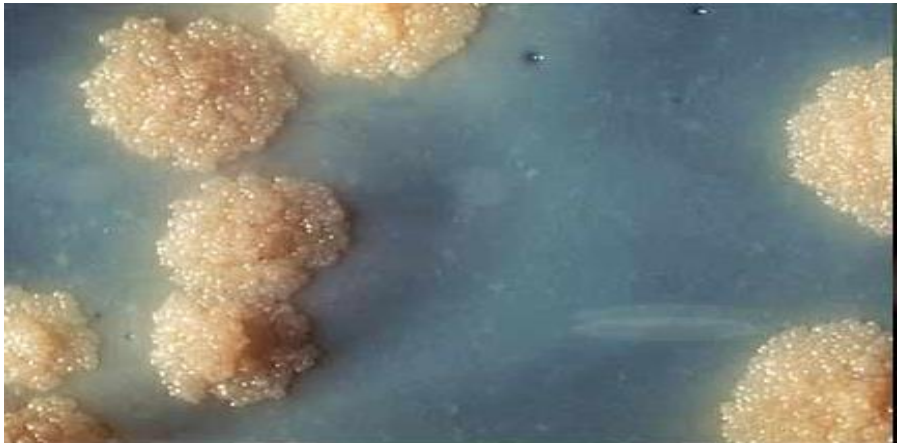
Lowenstein –Jensen Medium

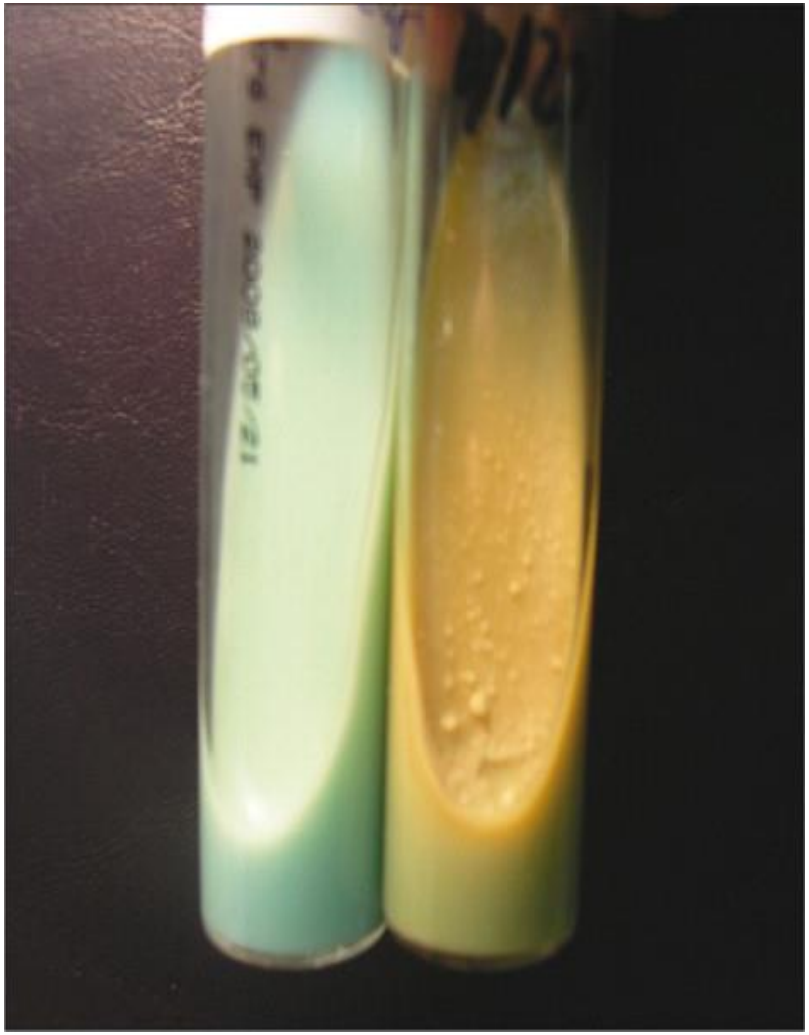
- Contain malachite green and egg albumin
- Media color : green
- Cell show :

Rough

Tough

Buff





Incubation Period = 4 weeks

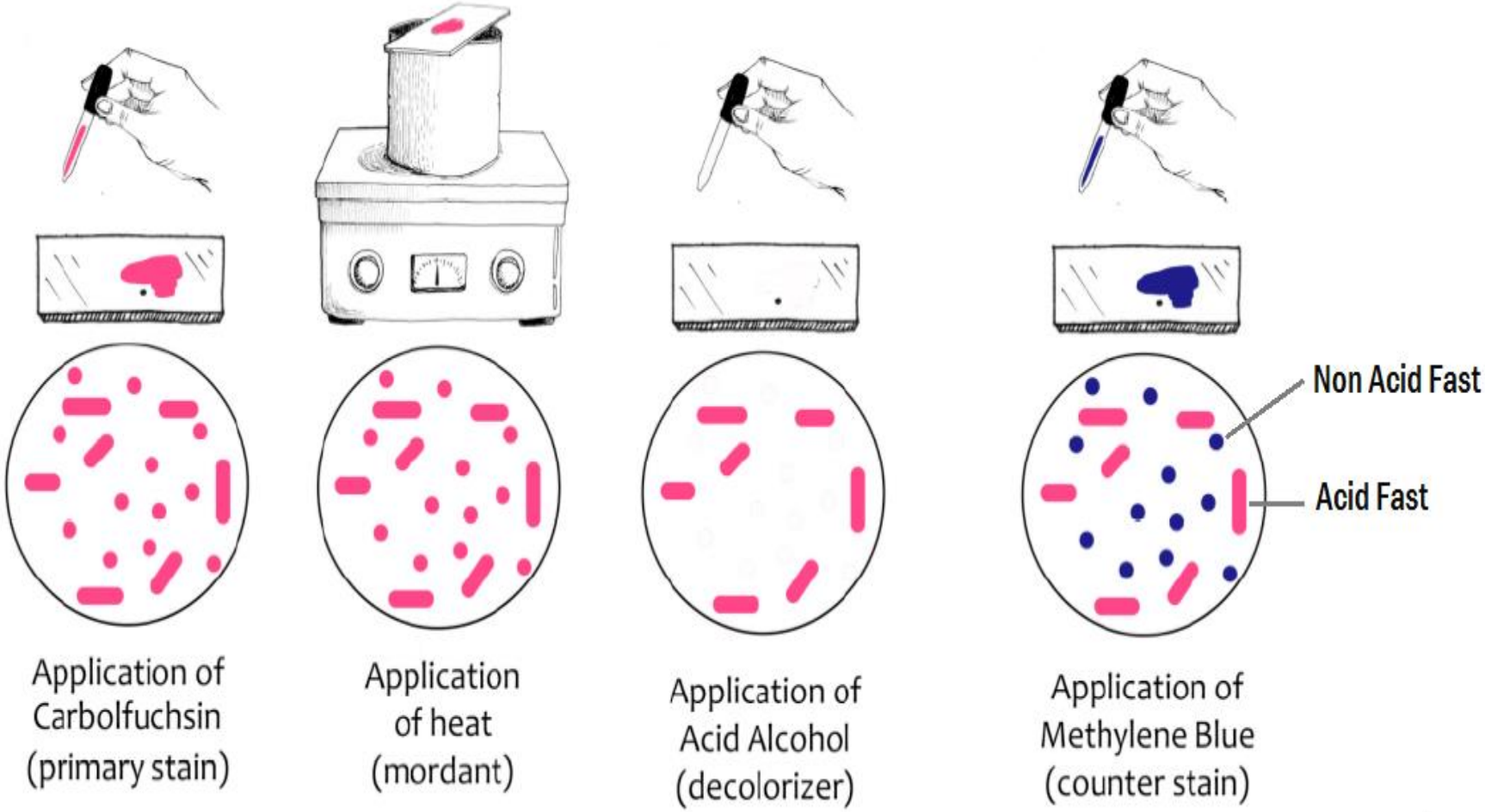
Put the media in covered tubes to avoid drying of media

ziehl neelsen
Acid fast stain

- Mycobacterium Tuberculosis cell wall are waxed for that reason do heating while staining .

- Stain made of :

- **Carbol fuchsin**
- **Hydrochloric acid alcohol (3% HCL)**
- **Methylen blue**


Non Acid Fast
Acid Fast
Application of Carbolfuchsin (primary stain)
Application of heat (mordant)
Application of Acid Alcohol (decolorizer)
Application of Methylene Blue (counter stain)

T.B
Acid fast stain