Summary Lec (4)

(وَلَسَوْفَ يُعْطِيكَ رَبُّكَ فَتَرْضَى)

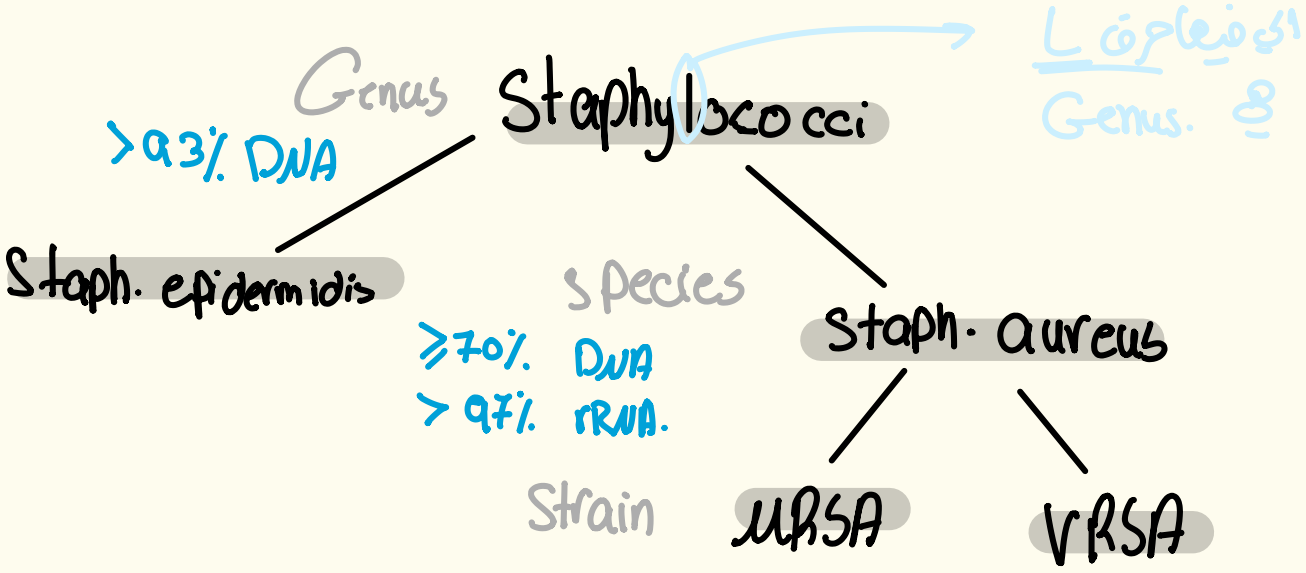
3/12/024

Bacterial Taxonomy

- Classification.
- Nomenclature.
- Identification.

Bacterial RANK

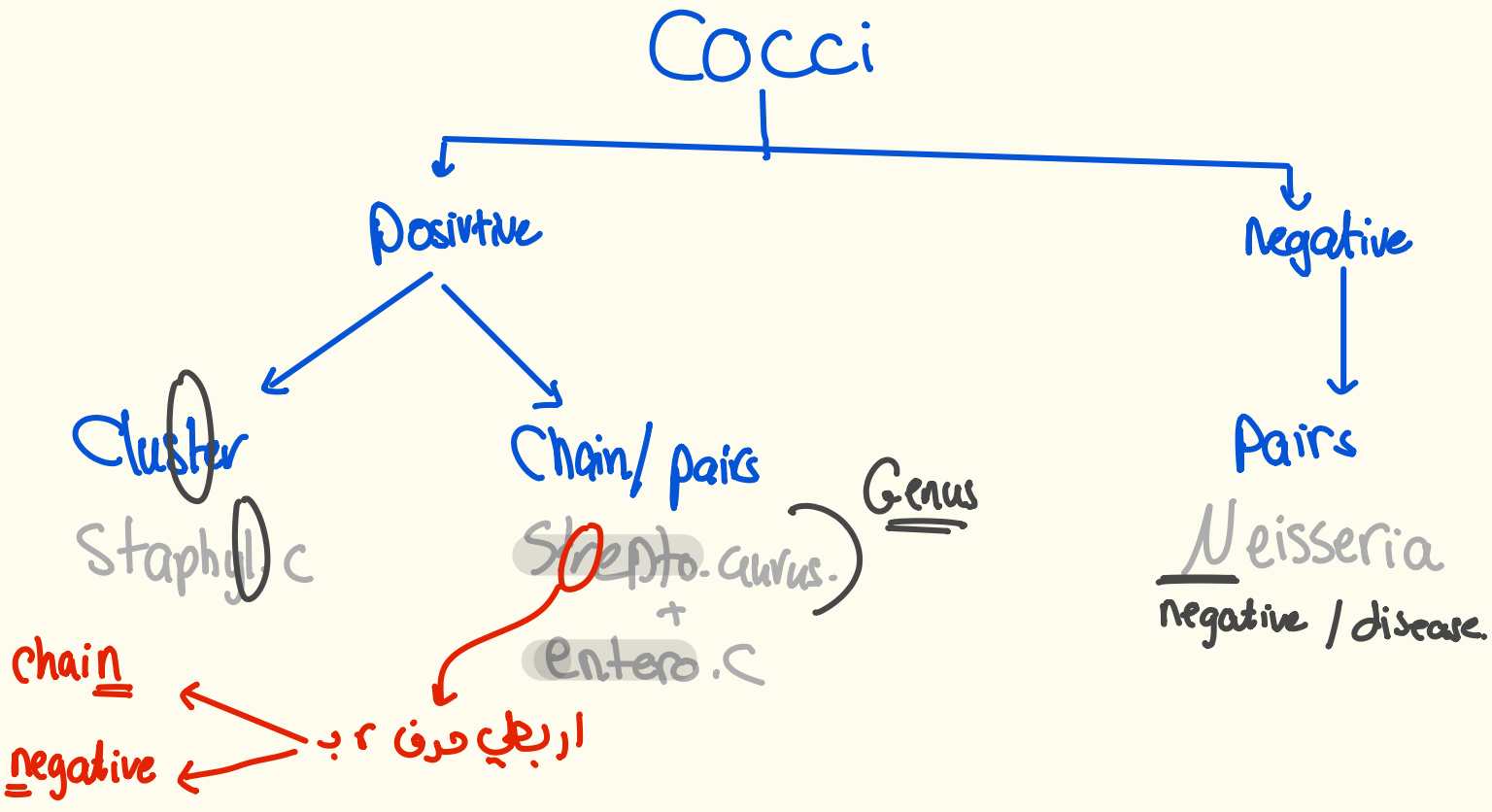
·Keep Dishes Clean OR Family Get sick Soon.

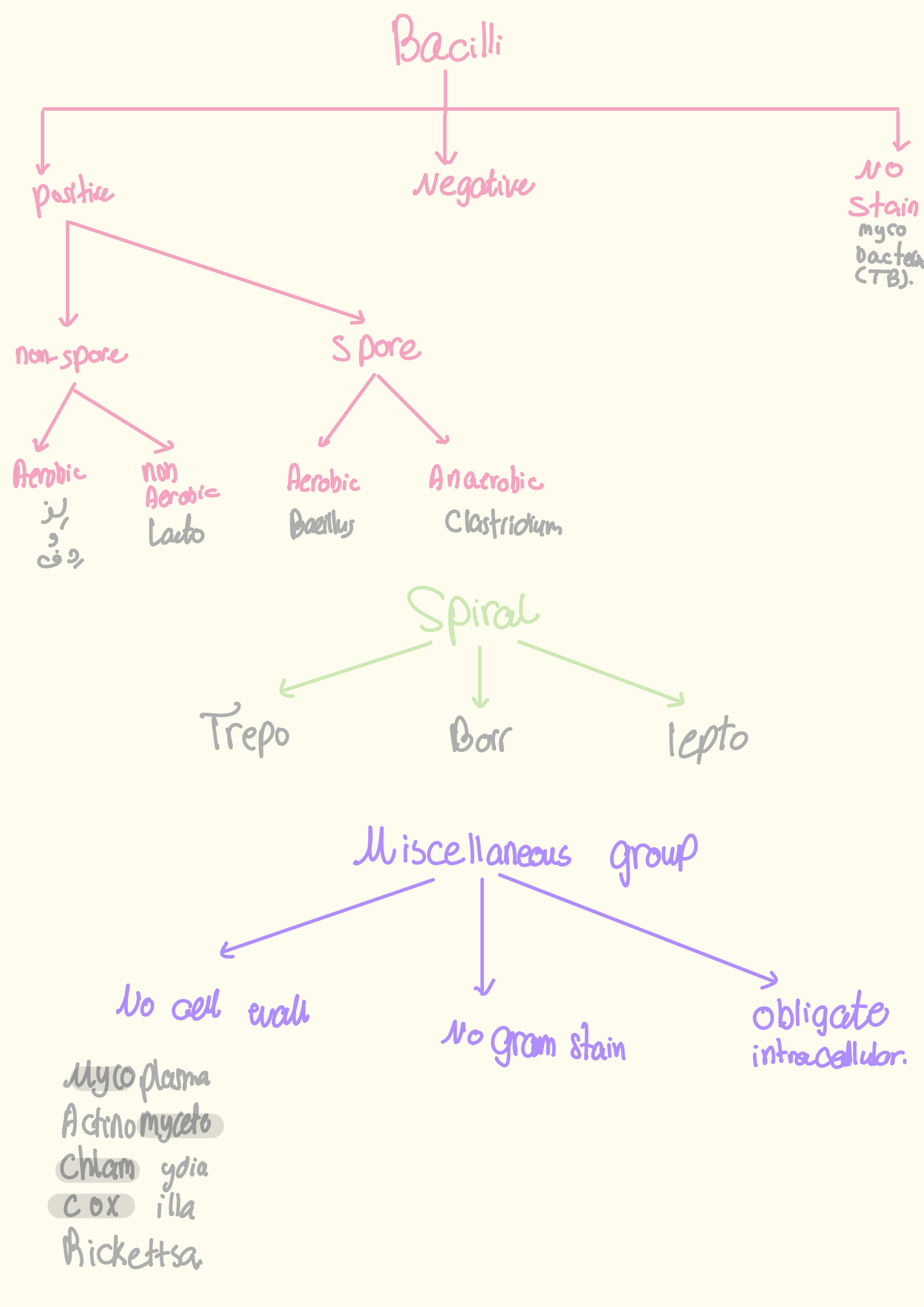


Nomenclature

Genus. species.

Scheme of medical bacteria.



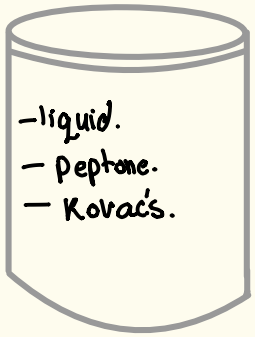

Bacilli
Positive
Negative
No Stain
myco Bacteria (TB).
non-spore
Spore
Aerobic
Non Aerobic
Lacto
Aerobic
Bacillus
Anaerobic
Clastridium
Spiral
Trepo
Borr
lepto
Miscellaneous group
No cell wall
No gram stain
obligate intracellular.
Mycoplasma
Actinomycete
Chlamydia
Coxiella
Rickettsa

Biochemical reaction

peptone: bacteria nutrients

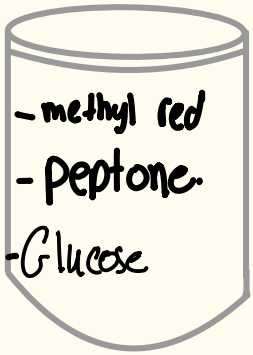
Indole test

- Test for: Tryptrophanase
- The result: Produce Indole (red).



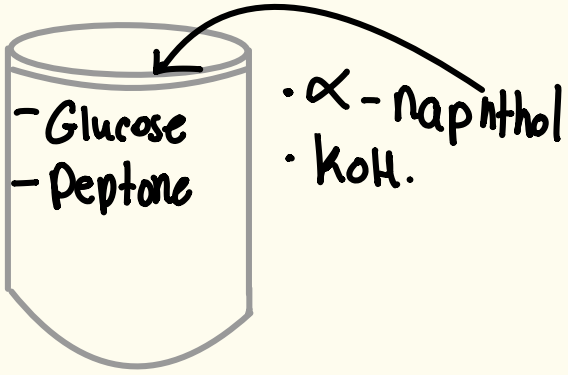
Methyl red

- Test for: ferment glucose to Acid.
- The result: Acid (red). <4.



Voges-proskaur test (V.P)

- Test for: ferment Glu into acetoin.
- The result: Diacetyl (red).

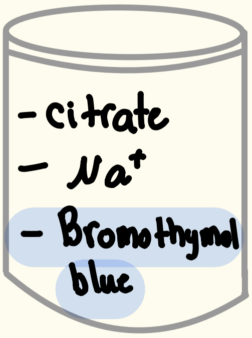


اللهم يا حي يا قيوم، رب موسى وهارون ونوح و إبراهيم وعيسى ومحمد صلى الله عليه وسلم، أكرمني بجودة الحفظ وسرعة الفهم، وارزقني الحكمة والمعرفة والعلم وثبات الذهن والعقل والحلم

Citrate utilizatioz

- Test for: Citrase
- The result: Sodium Carbonate (↑ PH).

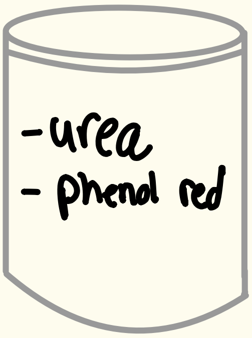
سترييت ← أزرق



No peptone, only citrate as a carbon source!

urease test

- Test for: urease.
- The result: ammonia react with phenol red indicator.



TSI test

→ Gel media (solid since it contains (3 types of sugar, phenol red, iron salts, Protein))

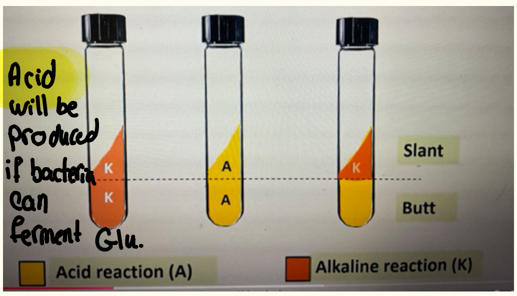
- The differentiation is based on
  - Sugar fermentation.
  - Gas formation.
  - Hydrogen sulfide production.

- Suger —phenol red→ Acid

- bacteria use H^+ to produce H_2 gas → gas displaced media / breaks appear. (ابزيحه للأعلى)

- Hydrogen sulfate —iron salt→ Ferric sulfide (black)

بطلع راسب أسود {ferric sulfide} ←
ودليل إنه البكتيريا بتقدر تنتج hydrogen sulfate.



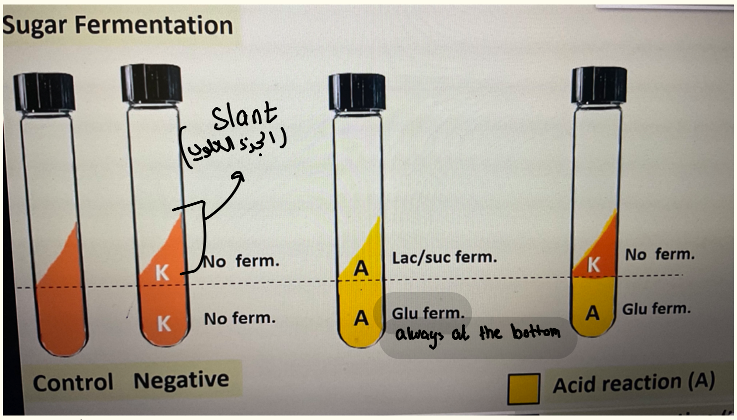
Acid will be produced if bacteria can ferment Glu.

★ Interpretation :-

- upward displasment/ كسر بيتي ⇒ bacteria can produce gas.
- always, we have → upward → lac/suc
  → downward → Glu

تذكير : لما البكتيريا تقدر تخمّر السكر بتحول من أحمر إلى أصفر

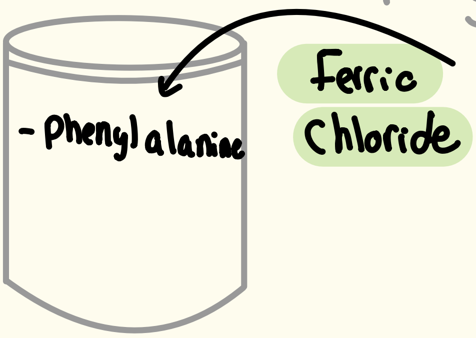
> the medium is typically red (alkaline) due to the pH indicator (phenol red), When bacteria doesn't ferment sugar , it utilize proteins (such as peptones) in the medium, they produce alkaline byproduct.
> مش تكسير
> This increases the pH of the medium, causing the phenol red indicator to remain red or turn more red, indicating an alkaline environment.



• A/K ⇝ rare !

Phenyl alanine deaminase

- Test for: determine if (Salmonella / Shigella) exist in sample. only those contain enzyme.
- The result : phenyl-pyruvaic Acid (green).

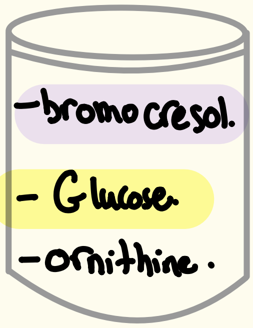


alanine ⇒ Salmonella (n)

Ornithine decarboxylase

carbon source

- Test for : distinguish between rettegri / morgani
  ما عندها / عندها الانزيم
- The result : purple if it is morgani
  yellow if it ferment Glu only.



The Analytical Profile index (API)

- group of reactions with different type of API → Enterobacteria 20E/20NE
  → Streptococci 20 STREP.

we want to identify Species.

we want to determine which bacteria produce specific enzyme:

Three tests

Oxidase test

⇓

Distinguish between:

Entero.b vs Pseudomonas

Positive result

* ممكن استخدم ال test عشان اميز ال pseudomonas عن أي بكتيريا ثانية.

• Detection by:

adding drops of colorless oxidase reagent.

Catalase test

⇓

Distinguish between:

Strepto vs Staphylo

bubbles...

• Detection by:

adding H_2O_2;

$$H_2O_2 \xrightarrow{Catalase} 2H_2O + O_2$$

to diffrintiate between Staphylo types:-

Coagulas test

⇓

Distiguish between:

Aureus vs another types

Clot formation

• Detection by:

Convert fibrinogen to fibrin then detect by slide or test tube method

اللهم منزل الكتاب، ومجري السحاب، وهازم الأحزاب، اهزم اليهود وانصرنا عليهم