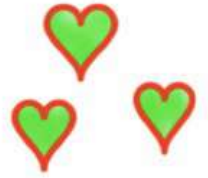




النادي
MC
الطبي

Done By :
Baraa Safi



لا تنسونا من دعائكم بالتوفيق

A) Collection of sputum sample

Q مهم تعرف أنه

و لازم القلاش يكونوا سالت عشانه
Sputum either:

بنوخذ 3 عينات في 3 أيام مختلفة في الـ TB

مع معرفة السبب

Negative

- Expectorate, patient cough deeply and spit any sputum.
- Induced sputum, produced by using nebulized hypertonic saline.
- Collected into a clean, dry, wide-necked, leak-proof container.
- **It is important that true sputum (not saliva).**
- Sputum is best collected in the **morning** soon after the patient wakes.
- When pulmonary tuberculosis is suspected, up to **three specimens** may need to be examined to detect AFB.
- The sputum should be delivered to the laboratory without delay because organisms such as *S. pneumoniae* and *H. influenzae* do not survive well in specimens.



Sputum Sample Container

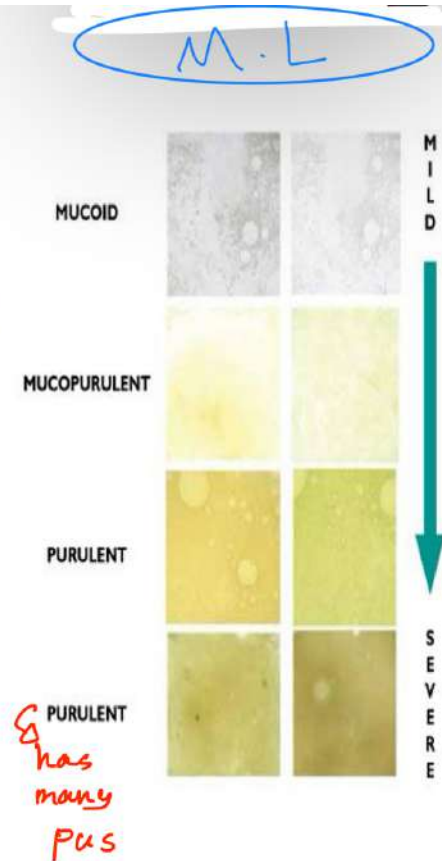
Q سوال المصاحبة (TB)

Micro Lab



B) Macroscopic examination of the sputum

- **Normal sputum:** Thin and clear colorless mucus.
- **Mucopurulent:** Yellow / green with pus and mucus.
- **Purulent:** Yellow / green, opaque, mostly pus (large numbers of white blood cells).
- **Bloody sputum (hemoptysis):**
 - ✓ Blood-streaked or Massive blood: could be due to lung cancer, tuberculosis, lung abscess.
 - ✓ Currant jelly sputum: K. pneumonia.
- **Rusty sputum** (due to decomposed Hemoglobin): it is typical for S. pneumonia.
- **Green / blue sputum** (due to exopigment): P. aeruginosa.



سؤال بإمتحانه عند (primary and counter stain)

توزيع محوود ناري

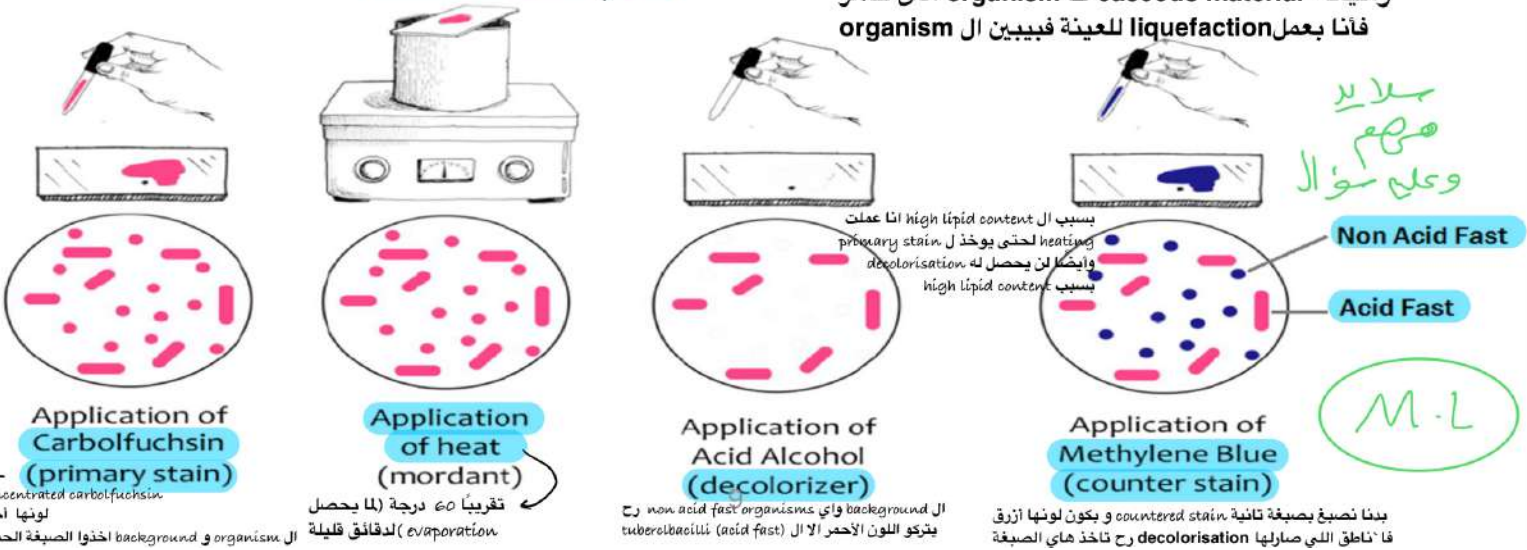
2) Ziehl-Neelsen smear: when M. tuberculosis infection is suspected.

Decontamination & concentration (Petroff's method): Petroff's method يعمل Ziegler-Neelsen stain قبل ما اصبغ العينة ب alkaline and acidic بعمل decontamination باستخدام مجموعة من tb compounds عشان اتخلص من normal flora (كما نعلم ان tb resistant لمعظم acidic and alkaline media)

1. Liquefies the specimen, so release the tubercle bacilli.
2. Destroys bacteria other than T. B bacilli.

4% NaOH + specimen → incubate (30min, 37°C) → centrifuge (30min) → neutralize deposit by 8% HCL

معظم عينات sputum من مرضى tb بتكون thick and purulent ومليانه caseous material ف organism مش ظاهر فانا بعمل liquefaction للعينة فبيبين ال organism



ملاحظة الدكتورة قالت أنها لوح تجيب Study case with picture

و لوح تطلب اسم ال (organism) أو وحدة منه صفاته رأنا لوح أحط

كل البكتيريا بس لوح أحرد ال (٣) اللي الدكتورة ركزت عليهم أكثر

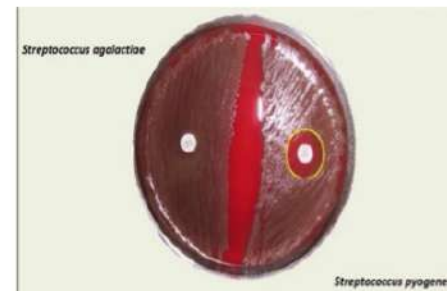
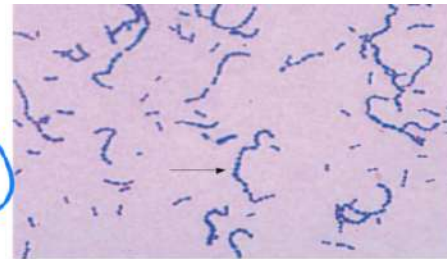
بلاش تجيب اشي غير ال (٣) لو مافي وقت بس ادرس ال (٣) اللي مكتوبه عليهم
مهم

M.L

Streptococcus pyogenes

- **Gram-positive cocci**, arranged in chains.
- **Complete (Beta) hemolysis on blood agar.**
- **Catalase negative** (Differentiate with Staphylococci which are catalase positive).
- **Bacitracin sensitive** (Differentiate with other beta hemolytic streptococci such as *S. agalactiae* which is bacitracin resistant).

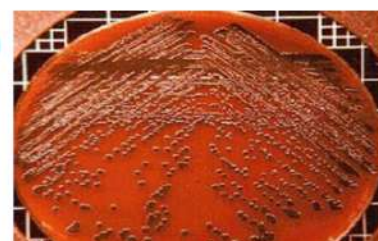
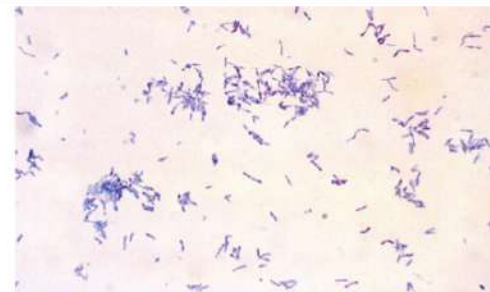
M.L



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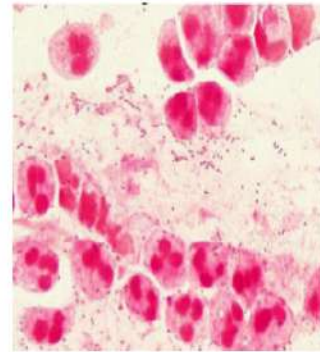
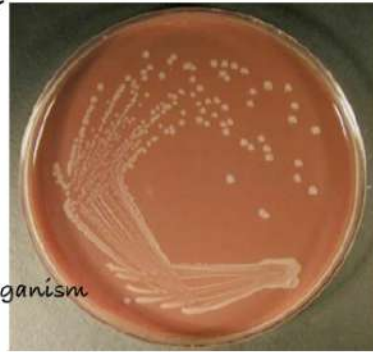
Corynebacterium diphtheria

- **Gram positive rods.**
- **Non-spore-forming.**
- **Chinese-letter appearance.**
- **Metachromatic or volutin granules.** Best seen by **methylene blue** or **Neisser or Albert's stain.**
- **Black colonies on blood tellurite agar (Selective medium)**
(blood agar + 0.04% potassium tellurite)

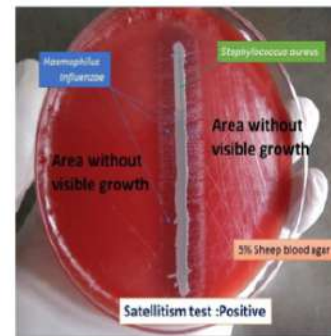


Haemophilus influenzae → ^{عندنا} capsule

- **Gram negative coccobacilli.**
- * **Quellung reaction positive.** ^{Haemophilus influenzae} ^{عندها capsule لذلك}
- **Grow on chocolate agar.**
- **X&V factor test: requires both factors.** ^{الوحيدة}
- **Grow close to colonies of Staph aureus. (satellitism).**
- **Produce NO hemolysis.**



quellung reaction positive → Capsulated organism

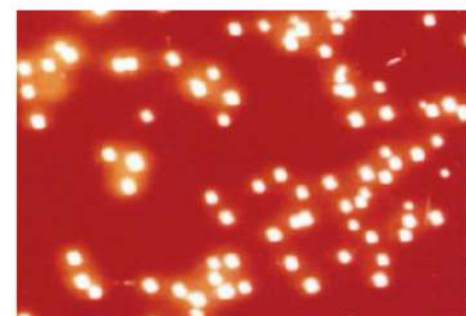


Bordetella pertussis



- **Gram negative coccobacilli.**
- Grows on:
 - ✓ **Bordet Gengou medium**
 - ✓ **Charcoal-cephalexin blood agar.**
- Colonies are greyish white with shiny convex surface “Mercury drop” appearance.
- Does NOT require X and V factors.

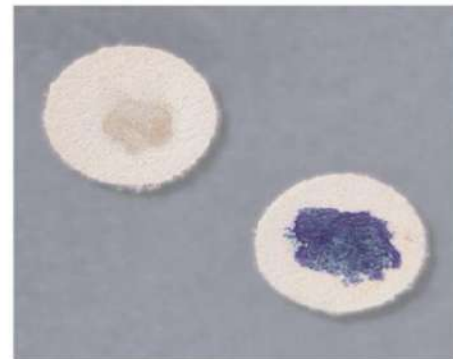
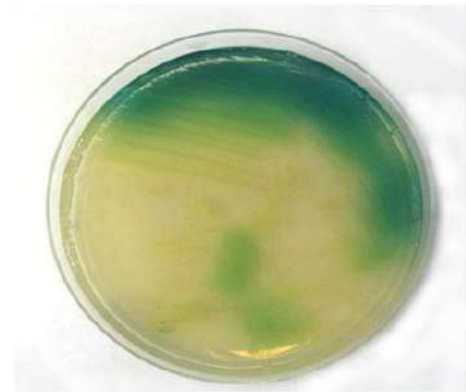


Charcoal-cephalexin blood agar



Pseudomonas aeruginosa

- **Gram negative bacilli.**
- **Motile.** 
- **Growth at 42°C.** 
- **Sweet or grape like odor (fruity aroma).**
- **Pale yellow colonies on MacConkey's.**
- **Produce exopigments.**
- **Oxidase positive.**

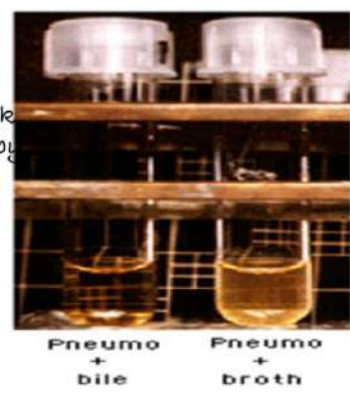
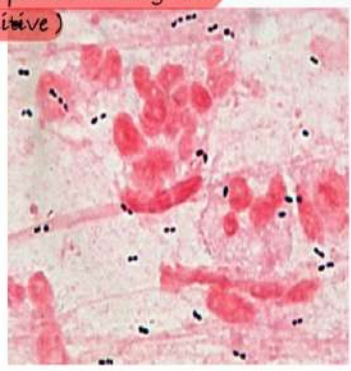


Streptococcus pneumoniae

Streptococcus pneumoniae
Haemophilus influenzae → Quellung reaction positive (capsule swelling test positive)

- Gram-positive, diplococci.
- Capsulated, capsule appears as unstained halo.
- Quellung reaction positive.
- Alpha haemolysis on blood agar.
- Optochin sensitive. = killed (inhibited) by optochin = optochin disk surrounded by clear zone
- Ferment Inulin.
- Soluble in bile. → clear عند وضع بيلة الانبوية صارت clear clearance tube bile insoluble معناته turbid لو ضل
- Catalase-negative.

M
L



Optochin resistant = can grow in presence of optochin = grow around the disk of optochin

clear عند وضع بيلة الانبوية صارت clear clearance tube bile insoluble معناته turbid لو ضل

مفردة حرة

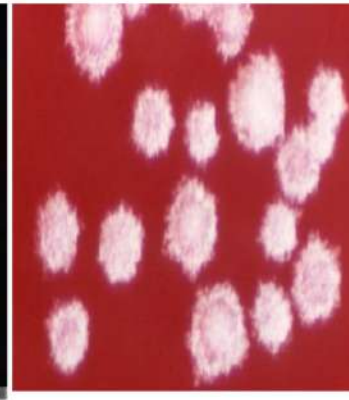
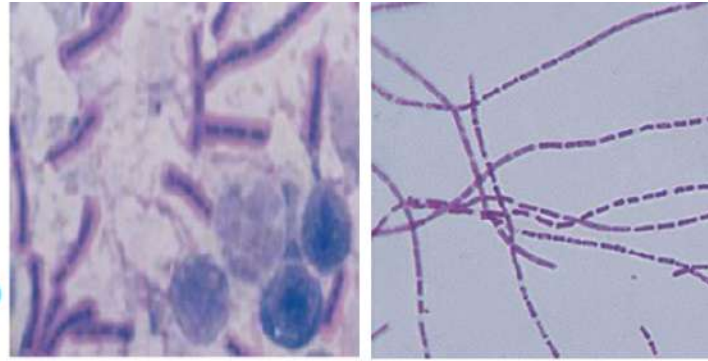
Klebsiella pneumoniae

- Gram-negative bacilli.
- Non-motile.
- Rose pink colonies on MacConkey's (lactose fermenter).
- Colonies are big, high convex with mucoid appearance.



Bacillus anthracis

- Gram positive bacilli arranged in chains.
- Sporulated, the spores are oval, central.
- With polychrome methylene blue, the organism stains blue while the capsule purplish. (McFadyean's reaction)
- Colony is large opaque with rough surface and fimbriate edge (medusa head).
- Liquefies gelatin (inverted fire tree).

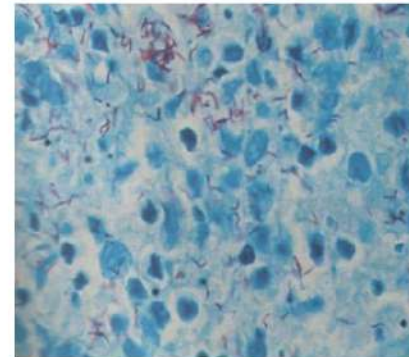


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M.L

Mycobacterium tuberculosis

- Acid fast bacilli (Pink rods against blue background) by Ziehl-Neelsen stain.
- Obligate aerobe.
- Slow growers, growth appears after 4-6 weeks.
- Selective medium, Lowenstein-Jensen (L-J).
- Alternative media, Middlebrook's 7H10, 7H9.



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