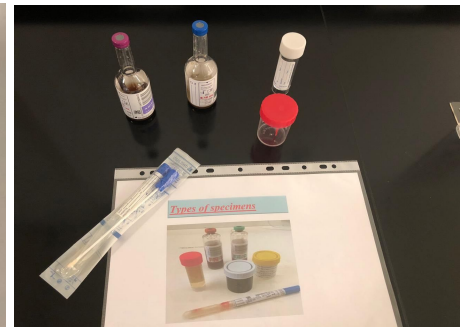
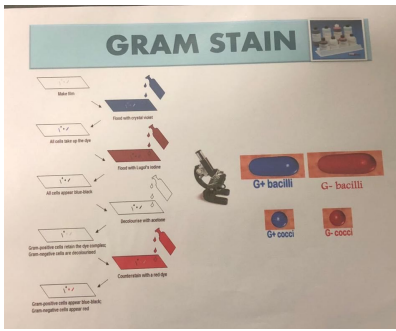
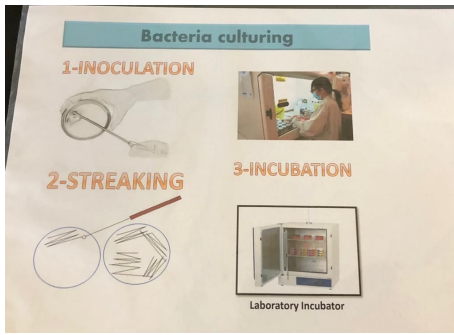


Microbiology Team Work

Foundation Block

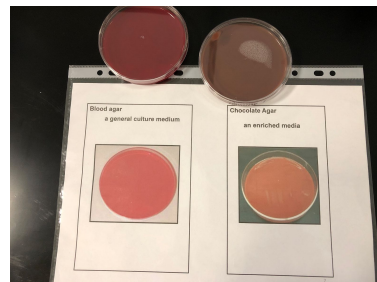
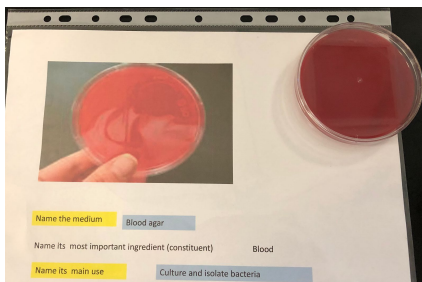
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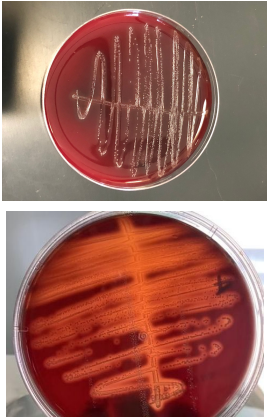
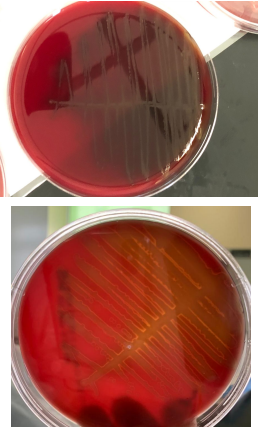

Pink borders = Girls ||| Blue borders = Boys

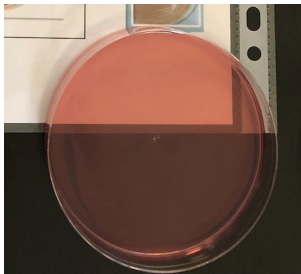
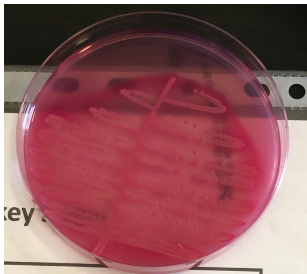
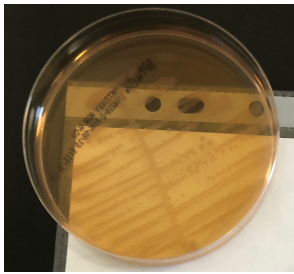


Culture Media

E.g.	Purpose	Type of Media
Blood Agar 	<p>إذا حظيت البكتيريا فيه ممكن اشوف 3 نتائج (إذا رفعتوها للنور تبين لكم أكثر) ١- يصير فيه شفافية حول colonies معناها Beta hemolytic ٢- يصير لون colonies على اخضر معناها Alpha hemolytic ٣- مايتغير شي واضح ومايحصل hemolysis معناها Gamma hemolysis</p>	General
Thiosulphate citrate bile salt sucrose TCBS 	Suppression of unwanted microbes; encouraging desired microbes.	Selective
MacConkey Agar لونها بينك فاتح مره وشفاف 	<p>Differentiation of colonies of desired microbes from others.</p> <p>الميديم هذا لما احط فيه بكتيريا ممكن اشوف نتيجتين اذا صار لونها Pale يميل للاصفر معناه البكتيريا هذي Non-lactose fermenter e.g. Salmonella اذا صار لونها بينك اغمق شوي معناها البكتيريا اللي حظيتها Lactose fermenting e.g. E. coli</p>	Differential
Chocolate Agar لونها بني 	Similar to selective media but designed to increase the number of desired microbes to detectable levels.	Enrichment



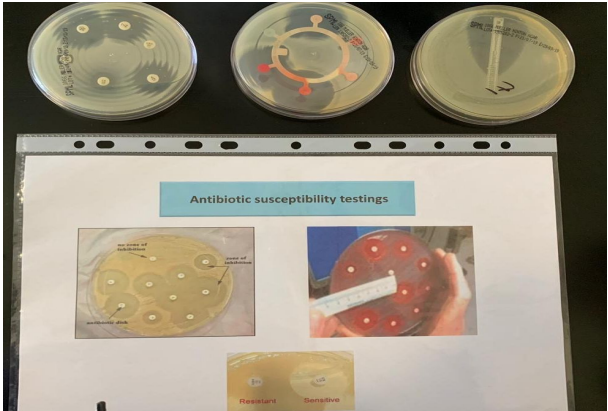
Hemolysis in blood Agar (Identification of streptococci) +ve cocci		
		
<p>Beta hemolytic Streptococcus colonies “complete hemolysis(<u>clear zone</u>) around the colonies “ St.pyogenes</p>	<p>Alpha hemolytic Streptococcus colonies “form <u>greenish</u> zone around the colonies “ St.pneumoniae</p>	<p>Gamma hemolytic Streptococcus colonies “<u>No change</u> around the colonies” Enterococcus faecalis</p>

MacCorney's agar (differentiation gram negative bacteria)		
		
<p>MacCorney's agar مافيها بكتيريا لسه فاضية</p>	<p>MacCorney's agar with Lactose fermenting pink colonies E.g. E. Coli</p>	<p>MacConkey's agar with Non-Lactose fermenting (colorless) colonies E.g. Salmonella</p>

Antibiotics Susceptibility Testing

If the bacteria grow up to the disk = the bacteria are resistant to this antibiotic.

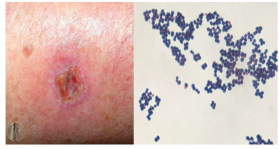
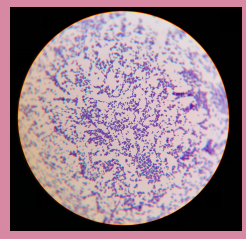
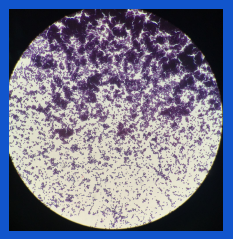


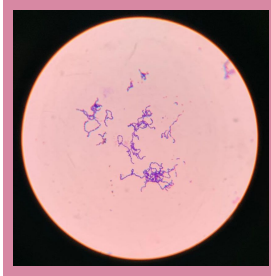
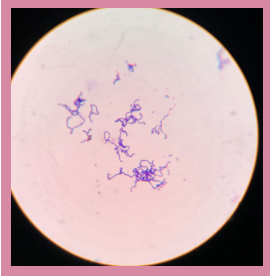
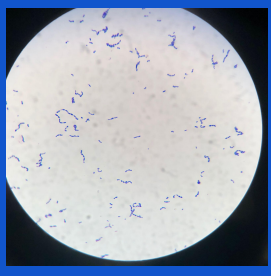
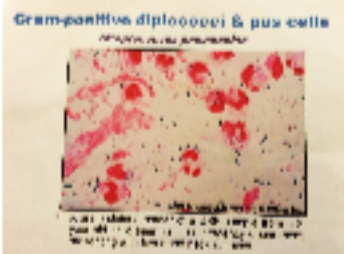
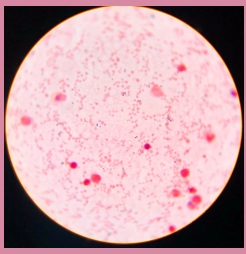
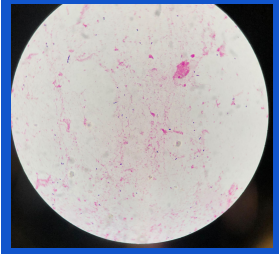
If the bacteria inhibit far away from the disk = the bacteria are sensitive to this antibiotic.



When we're going to describe a slide, we have to mention:

- the gram stain action (if +ve or -ve) = depends on the color if red or blue.
- the shape (if cocci or bacilli)
- if it's cocci, we have to mention the arrangement

Gram Positive Cocci

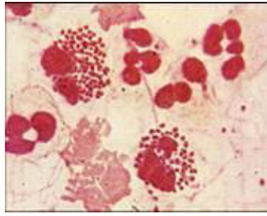
<p>Gram +ve cocci</p> <p>In clusters</p> <p>Staphylococci</p>	<div style="text-align: center;"> <p>Following is the Gram stained smear of an organism isolated from a wound infection.</p>  <p>Describe what you see in the slide above. Gram-positive cocci in clusters What is the likely organism? Staphylococcus aureus</p>   </div> <p style="text-align: center;">Gram positive cocci in clusters. Most likely Staphylococcus aureus.</p>
<p>Gram +ve cocci</p> <p>In chains</p> <p>streptococci</p>	<div style="text-align: center;">   <p>This is a bacterium isolated from a child with sore throat and tonsillitis .</p> <p>A: Describe the Gram stain Gram positive B: Describe the shape and arrangement of the bacteria Cocci in chains</p>    </div> <p style="text-align: center;">Gram positive cocci in chains. most likely, streptococci.</p>
<p>Gram +ve</p> <p>In chains (pairs)</p> <p>Diplococci</p>	<div style="text-align: center;"> <p>Gram-positive diplococci & pus cells</p>    </div> <p style="text-align: center;">Gram positive diplococci & pus cells, most likely streptococcus pneumonia.</p>

Gram Negative

Gram -ve

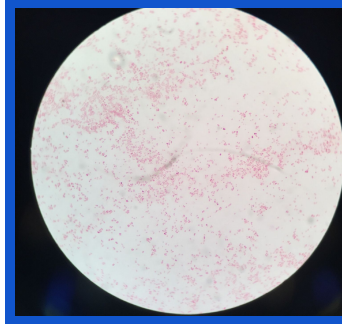
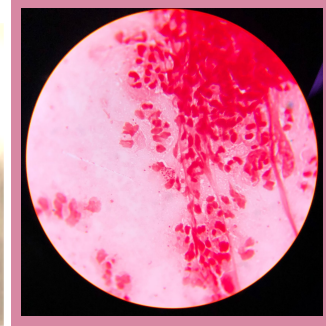
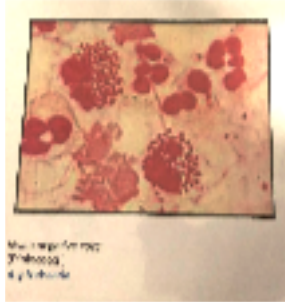
Diplococci
(in pairs)

Following is the Gram-stained smear of from urethra of a 25-year old male complaining of urethral discharge



Describe the Gram stain of the intracellular bacteria Gram negative

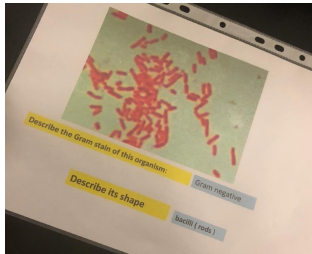
Describe the shape of the bacteria cocci (diplococci)



Gram negative diplococci, most likely *Neisseria*

Gram -ve

Bacilli

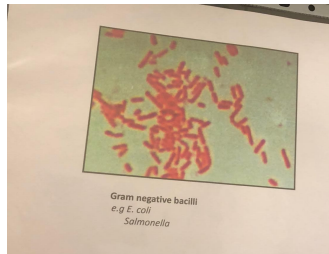


Describe the Gram stain of this organism.

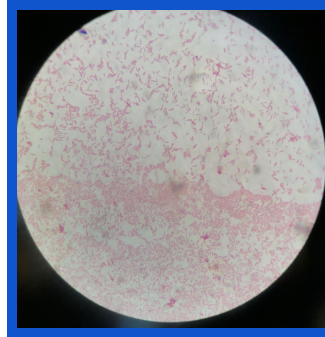
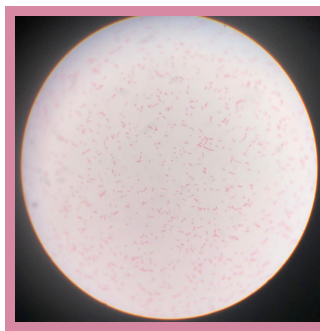
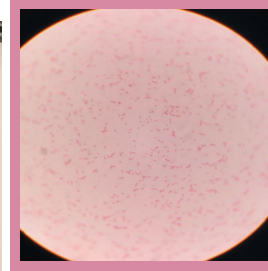
Gram negative

Describe its shape

Bacilli (rod)

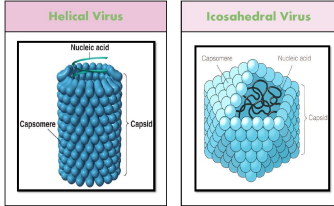
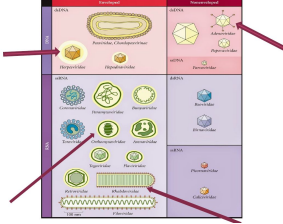
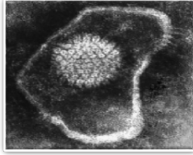
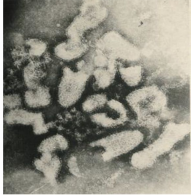
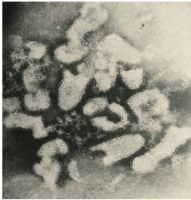
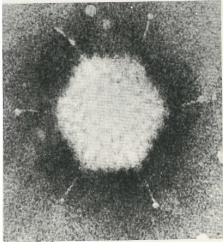
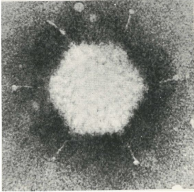




Gram negative bacilli
e.g. *E. coli*
Salmonella



Gram negative bacilli, rods, most likely *E. coli* or *Salmonella*.

Virology

<p>Viral Structure & Viral Classification</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>VIRAL STRUCTURE</p>  </div> <div style="text-align: center;"> <p>VIRAL CLASSIFICATION</p>  </div> </div>
<p>Herpes Virus</p>	 <p>loose envelope, icosahedral capsid (spherical), d.s DNA genome</p>
<p>Rabies Virus</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="background-color: #ADD8E6; padding: 5px;"><i>Rabies virus: Rhabdoviridae</i></p>  <p style="color: #800080;"><i>Bullet shape</i></p> <p style="text-align: center;"><i>Enveloped virus Helical capsid s.s RNA genome</i></p> </div> <div style="width: 45%;"> <p>This is an electron micrograph of a virus</p>  <p style="background-color: #FFFF00; padding: 2px;">Q1: Name this virus</p> <p style="background-color: #DDA0DD; padding: 2px;">Rabies virus</p> <p style="background-color: #FFFF00; padding: 2px;">Q2: Describe its structure.</p> <p style="background-color: #DDA0DD; padding: 2px;">Enveloped virus , Helical capsid & s.s RNA genome</p> </div> </div> <p style="text-align: center; color: red; font-weight: bold;">All helical viruses are Enveloped</p>
<p>Adenovirus</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="background-color: #ADD8E6; padding: 5px;"><i>Adenovirus : Adenoviridae</i></p>  <p style="color: #800080;"><i>Pleomorphic shape</i></p> <p style="text-align: center;"><i>Nonenveloped virus Icosahedral capsid d.s DNA genome</i></p> </div> <div style="width: 45%;"> <p>This is an electron micrograph of a virus</p>  <p style="background-color: #FFFF00; padding: 2px;">Q1: Name this virus</p> <p style="background-color: #DDA0DD; padding: 2px;">Adenovirus</p> <p style="background-color: #FFFF00; padding: 2px;">Q2: Describe its structure.</p> <p style="background-color: #DDA0DD; padding: 2px;">Nonenveloped virus, with fiber Icosahedral capsid & ds DNA genome</p> </div> </div> <p style="text-align: center; color: red; font-weight: bold;">It's the only virus that has fiber</p>
<p>Influenza Virus</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="background-color: #ADD8E6; padding: 5px;"><i>Influenza Viruses : Orthomyxoviridae</i></p>  <p style="color: #800080;"><i>Pleomorphic shape</i></p> <p style="text-align: center;"><i>Enveloped V & spikes Helical capsid Segmented s.s RNA</i></p> </div> <div style="width: 45%;"> <p>This is an electron micrograph of a virus</p>  <p style="background-color: #FFFF00; padding: 2px;">Q1: Name this virus</p> <p style="background-color: #DDA0DD; padding: 2px;">Influenza Viruses</p> <p style="background-color: #FFFF00; padding: 2px;">Q2: Describe its structure</p> <p style="background-color: #DDA0DD; padding: 2px;">Enveloped Virus with spikes , Helical capsid ,Segmented s.s RNA</p> </div> </div> <p style="text-align: center;">No specific shape الخطوط اللي في الـ envelope هي الـ spikes</p>

Notes:

In bacteria

- We use **Hemolysis in blood Agar** to differentiate between the different types of streptococcus (streptococcus is a genus of gram-positive coccus)

There are **three results**: alpha-beta- gamma

- We use **MacCorney's agar** to differentiate between the different types of gram -ve bacteria

There are **two results**: Lactose or non-lactose

In viruses

1- **Enveloped or non-enveloped**

presence of Spikes or not.

-helical capsid that means it's enveloped.

All viruses (in our Ex.) are enveloped except **Adenovirus** (non-enveloped).

2- **The arrangement of capsid** (Icosahedral-helical)

In these examples, we have 2 Ex. of icosahedral and 2 Ex. of helical

3- **The genome** If DNA or RNA It can be single or double

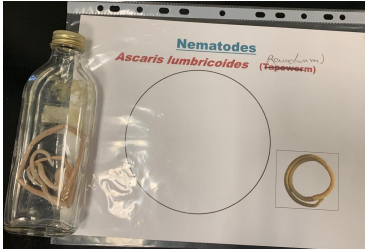
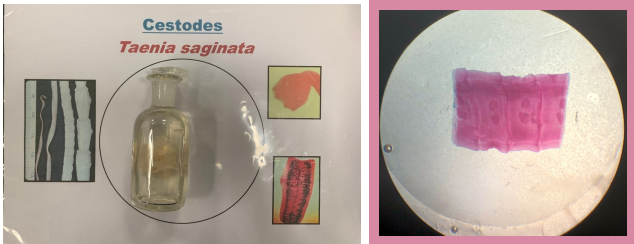
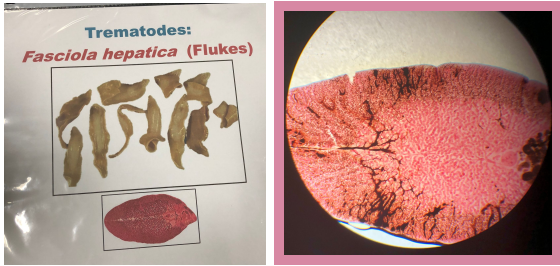
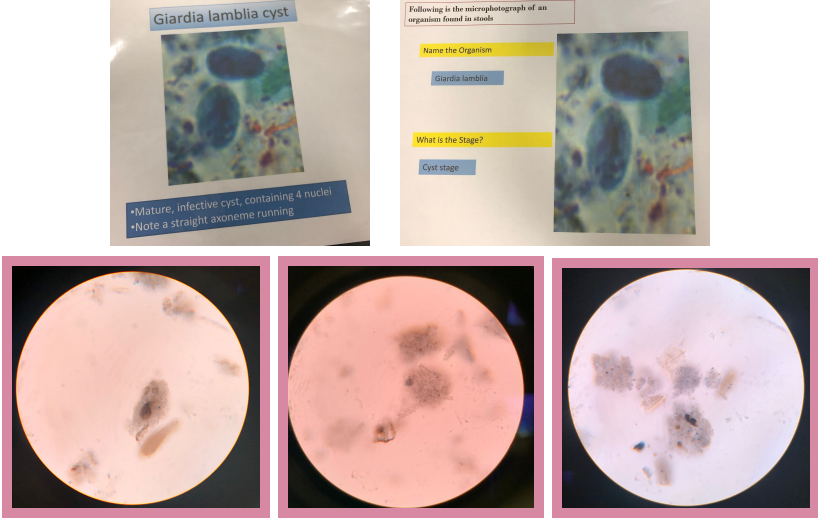
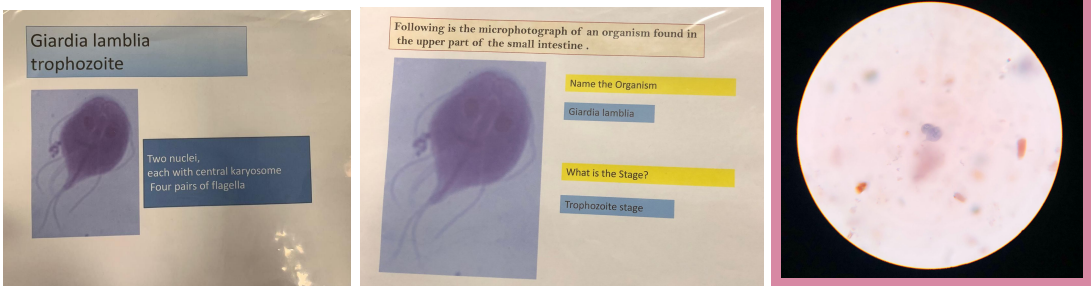
strand. In these examples, we have 2 Ex. of DNA virus and 2 Ex. of RNA virus

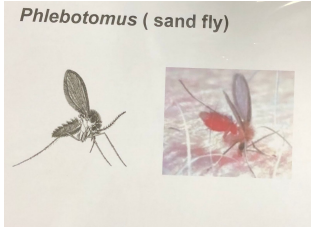
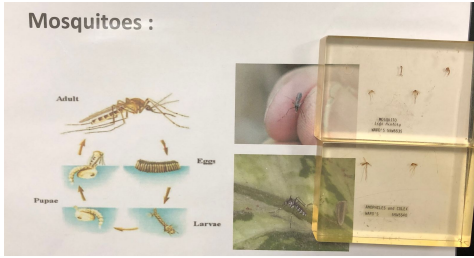
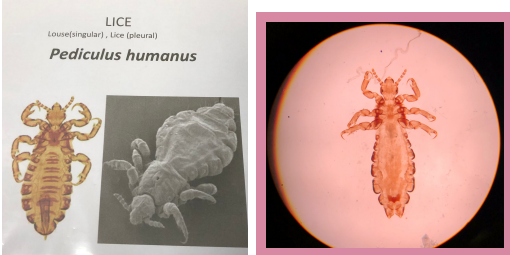
(RNA S.s - DNA d.s)

All the icosahedral is D.sDNA

All the helical is S.sRNA

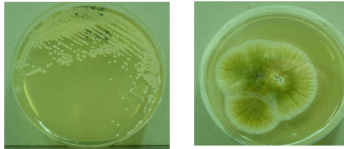
Parasitology

<p>Nematodes (roundworms)</p>	
<p>Cestodes (Tapeworms) (Flatworm)</p>	
<p>Trematodes (Flatworm)</p>	
<p>Giardia Lambia Cyst</p>	
<p>Giardia Lambia Trophozoite</p>	 <p style="text-align: center;">لو تدققون بالميكروسكوب شوي تقدرن تشوفون flagella</p>

<p>Phlebotomus (sand fly)</p>	<p><i>Phlebotomus</i> (sand fly)</p> 
<p>Mosquito</p>	<p>Mosquitoes :</p> 
<p>Lice (Pediculus humanus)</p>	<p>LICE (Louse[singular] , Lice [plural]) <i>Pediculus humanus</i></p> 

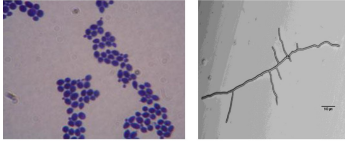
Fungi

Fungi can be divided to two types based on morphology



A B

Microscopic appearance of yeast and mould fungi



A B

Based on morphology, name the two fungal structures in A and B?

A: Yeast
e.g. *Candida*

B: Mould fungi
e.g. *Aspergillus*


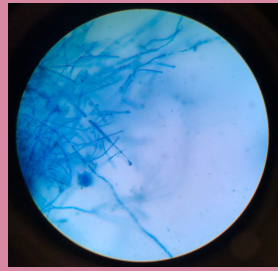
Name the two fungal structures in A and B?

A: Budding yeast cells
e.g. *Candida*

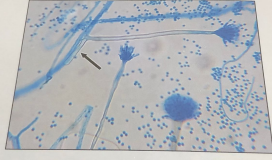
B: Branching Fungal hyphae
e.g. *Aspergillus*

Mould Fungi


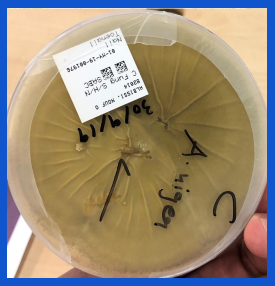
Fungi can be divided to two types based on morphology
1- Mould e.g. *Aspergillus*

Microscopic appearance of mold




Branching Fungal hyphae
e.g. *Aspergillus*

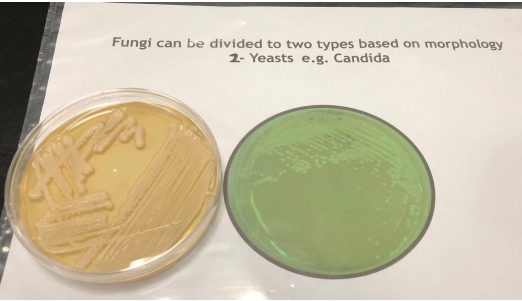



Most likely **Aspergillus**

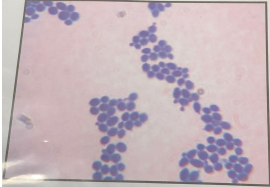
Yeast



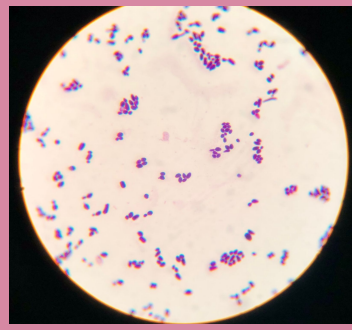
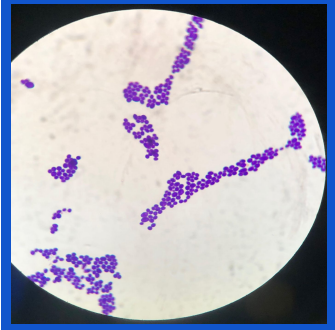
Fungi can be divided to two types based on morphology
2- Yeasts e.g. *Candida*



Microscopic appearance of yeast



Budding yeast cells
e.g. *Candida*

Most likely **Candida**

(Don't confuse this with Gram positive staph.)

Differences: 1) Larger 2) Some of them are smaller than the rest because they are budding

Wish You All The Best of Luck!!

See you in **MSK..**

Best Team EVER :)

**Manee Alkhalifah
Abdulaziz Alderaywsh
Sultan Alqahtani
Faisal Alomri
Munib Alkhateeb
Abdulaziz Alomar
Muhannad Alomar
Meshal Alhamed
Duaa Alhumoudi
Renad Alhomaidi
Sarah Alqahtani
Sadem Alzayed
Noura Alshathri
Ghadah Alsuwailem
Shahad Almezel
Noura Alsalem
Sumo Alzeer
Raghad Albarrak
Reema Alowerdi**