بسم الله الرحمن الرحيم


# SPECIFIC NAMES MENTIONED IN DR. ALAA'S MATERIAL

| ***Genus + species*** | **Details** |
|---|---|
| *Mycoplasma* | 1. A bacterial genus which doesn't have a cell wall (→ polymorphic shape) but have sterols instead.<br>2. They don't grow on ordinary culture media and need specific media instead. |
| *Bacillus anthracis* | 1. Their capsules have polypeptides instead of the regular polysaccharide composition<br>2. They have "Central & Oval" spore position |
| *Streptococcus pneumoniae* | Have 91 different capsule compositions due to different arrangement of polysaccharides. |
| *Haemophilus Influenzae* b | Their capsules are used to make vaccines |
| *Salmonella typhi* | Have peritrichous flagella |
| *Bacillus* & *Clostridium* | The two main spore forming genera |
| *Clostridium perfringens* | 1. "Sub-terminal & Oval" spore position<br>2. Aero-tolerant anaerobes |
| *Clostridium tetani* | "Terminal & Spherical" spore position |
| *Staphylococcus aureus* | 1. Indicates significant bacteriuria if ≥ $10^3$ (not $10^5$).<br>2. Catalase and Coagulase positive.<br>3. Gram positive coccus.<br>4. Unique golden colonies in culture media. |

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| | 5. Grows on nutrient agar media.<br>6. Can ferment mannitol<br>(unlike *Staphylococcus epidermidis* and *Staphylococcus spp.* which cannot) |
| MRSA (Strain) | Methicillin-Resistant *Staphylococcus aureus* |
| VRSA (Strain) | Vancomycin-Resistant *Staphylococcus aureus* |
| L-form bacteria | 1. Named after Leister city.<br>2. They partially lack a cell wall.<br>3. They need specific culture media to grow. |
| *Escherichia coli* | The most popularly studied prokaryote. |
| Enterobacteriaceae | 1. A large bacterial family of gram-negative bacilli.<br>2. Includes genera such as: *Escherichia*, *Proteus*, *Salmonella*, and *Shigella*.<br>3. Bile-selective (in MacConkey's agar) |
| *Mycobacterium tuberculosis* | 1. Is not killed by low-level disinfectants.<br>2. Undergoes binary fission every 24 hours.<br>3. Grows on Lowenstein Jensen Medium. |
| *Mycobacterium tuberculosis*<br>*Brucella abortus*<br>*Salmonella typhi*<br>*Coxiella burnetii* | These bacteria are killed by pasteurization. |
| *Geobacillus stearothermophilus* | 1. Spore-forming bacteria.<br>2. Used as a biological indicator in autoclaving. |
| *Vibrio cholerae* | 1. Undergoes binary fission every 13 mins.<br>2. Can ferment sucrose → yellow on TCBS agar<br>(unlike *Vibrio parahaemolyticus* → green on TCBS)<br>3. Alkaliphile (loves basic media ⇔ pH = 9) |
| *Streptococcus pyogenes* | 1. Used as an anticoagulant.<br>2. Grows on blood agar media. |
| *Staphylococcus aureus*<br>*Streptococcus pyogenes* | Complete (beta) hemolysis of blood agar. |
| *Streptococcus viridans*<br>*Streptococcus pneumoniae (pneumococci)* | Partial (alpha) hemolysis of blood agar. |
| *Enterococci* | No (gamma) hemolysis on blood agar. |
| *Haemophilus* & *Neisseria* | Two genera that grow on chocolate agar. |

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| *Corynebacterium diphtheriae* | Grows on blood tellurite agar. |
| *Pseudomonas aeruginosa* | Obligate aerobes |
| *Bacteroides fragilis* | Obligate anaerobes |
| *Campylobacter*<br>*Helicobacter*<br>(genera) | Micro-aerophilic |
| *Neisseria* & *Brucella* | Capnophilic ($CO_2$-loving); need 5-10% $CO_2$ |
| *Lactobacilli* (genus) | Acidophiles (loves acidic media ⇔ pH = 4) |

# SCHEME OF MEDICAL BACTERIA

## A) Cocci

| Name (Genus) | Gram Stain | Morphology |
|---|---|---|
| *Staphylococcus* | Positive | Cluster |
| *Streptococcus* | Positive | Chains or Pairs |
| *Enterococcus* | Positive | Chains or Pairs |
| *Neisseria* | Negative | Pairs (diplococci) |

## B) Bacilli

| Name (Genus) | Gram Stain | Spores | Aerobic/Anaerobic |
|---|---|---|---|
| *Corynebacterium diphtheriae* (species) | Positive | No | Aerobic |
| *Listeria* | Positive | No | Aerobic |
| *Lactobacillus* | Positive | No | Anaerobic |
| *Bacillus* | Positive | Yes | Aerobic |
| *Clostridium* | Positive | Yes | Anaerobic |
| *Mycobacterium*<br>*e.g. Mycobacterium Tuberculosis* (species) | None<br>We use "ZN" stain instead | - | - |

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|---|---|---|---|
| Enterobacteriaceae (family) | Negative | - | - |
| *Vibrio* | Negative | - | - |
| *Campylobacter* | Negative | - | - |
| *Helicobacter* | Negative | - | - |
| *Pseudomonas* | Negative | - | - |
| *Haemophilus* | Negative | - | - |
| *Bordetella* | Negative | - | - |
| *Brucella* | Negative | - | - |
| *Legionella* | Negative | - | - |
| G-ve Anaerobes | Negative | - | Anaerobic |

## C) Spiral

Treponema & Borrelia & Leptospira

## D) Miscellaneous Group

Mycoplasma & Chlamydia & Rickettsia & Coxiella & Actinomycetes

# BACTERIA IN BIOCHEMICAL REACTIONS (L-4)

| Name | Test | + / - | Observed |
|---|---|---|---|
| *Proteus* | Phenylalanine Deaminase | + | Green color |
| *Salmonella* | Phenylalanine Deaminase | - | No change |
| *Shigella* | Phenylalanine Deaminase | - | No change |
| *Morganella morganii* | Ornithine Decarboxylase | + | Purple color |
| *Providencia rettgeri* | Ornithine Decarboxylase | - | Yellow color |
| *Pseudomonas* | Oxidase | + | Purple color |
| Enterobacteriaceae | Oxidase | - | No change |
| *Staphylococcus* | Catalase | + | $O_2$ (gas bubbles) |
| *Streptococcus* | Catalase | - | No change |
| *Staphylococcus aureus* | Coagulase | + | Fibrin clots |
| Other *Staphylococci* | Coagulase | - | No change |