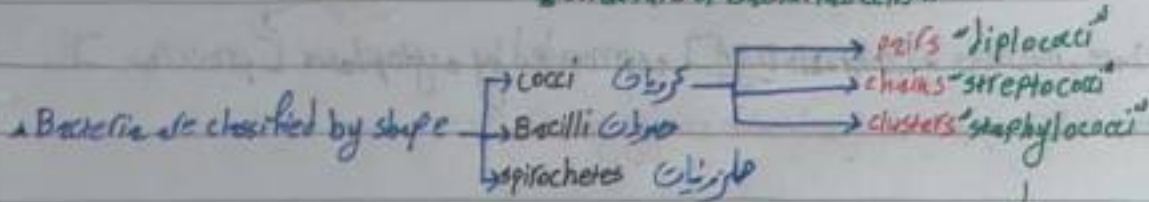




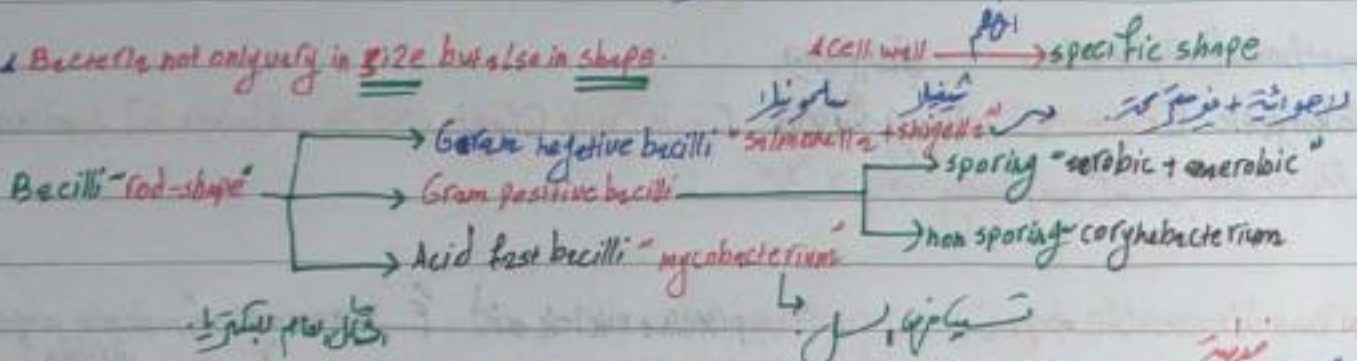
مقدم من فريق أفق الطبي



Structure of Bacterial cells



Bacteria not only vary in size but also in shape.



Address morphology of Bacteria

- ① vibrios (ميكروبكتيريا)
- ② spiral (مروحية)
- ③ filamentous (خيوطية)
- ④ fusiform (مخروطية)

Size → smallest bacterium - mycoplasma (= largest viruses - poxviruses) < largest bacteria rods

Yeast & RBCs

Cell wall → outermost component of bacterial cell / like mycoplasma → bounded by cell membrane.

Some bacteria have surface features → capsule, flagella, pill

Cell wall is composed of peptidoglycan → provides structural support + maintains the shape of cell + allows the cell to withstand media of osmotic pressure → - water

Cell wall of gram +ve and gram -ve

	gram +ve	gram -ve	
peptidoglycan	thicker, multilayer	thinner, single layer	
teichoic acids	yes	no	lying between the outer membrane layer and the cytoplasmic membrane
lipopolysaccharide + lipo protein + phospholipid	No	yes	In gram +ve → periplasmic space
	attached to the cell wall.		
	endotoxin = LPS		

periplasmic space $\rightarrow$ penicillin + β -lactamase $\rightarrow$ drug inhibition $\rightarrow$ secreted $\rightarrow$ B-lactamases $\rightarrow$ gram +ve $\rightarrow$ B-lactamases $\rightarrow$ gram +ve

periplasmic protein + oligosaccharides in solution $\rightarrow$ live $\rightarrow$ live

important properties of cell wall $\rightarrow$ polysaccharides + proteins "antigens" $\rightarrow$ laboratory identification $\rightarrow$ porin proteins $\rightarrow$ facilitating the passage of some hydrophilic molecules in the cell $\rightarrow$ channel to allow the entry of essential substances

porin protein $\rightarrow$ outer membrane of gram +ve bacteria $\rightarrow$ channel to allow the entry of essential substances

Three important components of the cell wall: ① peptidoglycan ② lipopolysaccharide ③ Teichoic acid

lipopolysaccharide $\rightarrow$ peptides + sugar glycine $\rightarrow$ NAM $\rightarrow$ NAG $\rightarrow$ peptidoglycan $\rightarrow$ murein + mureopeptide

peptidoglycan $\rightarrow$ good target for antibacterial drug

tetrapeptides $\rightarrow$ rare d-isomers of amino acid $\rightarrow$ inhibit the synthesis of peptidoglycan by inhibiting the transpeptidase that makes the cross-links between the two adjacent tetrapeptides

cytoplasm $\rightarrow$ DNA $\rightarrow$ morphous matrix that contains ribosomes, nutrient granules + plasmids $\rightarrow$ storage of nutrients $\rightarrow$ granules

① stain characteristically w/ the certain dyes

ribosomes a site of protein synthesis in a eukaryotic cell $\rightarrow$ size $\rightarrow$ ribosomes $\rightarrow$ chemical composition

differences in both "rRNA" + "proteins" $\rightarrow$ basis of the selective action of "out not human" $\rightarrow$ several antibiotics that inhibit bacterial

antibiotics that inhibit bacterial

granules $\rightarrow$ reserve of high energy stored in the form of polymerized metaphosphate

metachromatic $\rightarrow$ stained red with methylene blue dye $\rightarrow$ blue

Corynebacterium diphtheriae $\rightarrow$ diphtheria $\rightarrow$ gram +ve cells $\rightarrow$ aerobic $\rightarrow$ solid