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Date:
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Website:

Lecture title: Bacteria

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Summary: Bacteria

Living cells: the smallest units capable of independent existence, can be divided in to two different groups, Eukaryotes and Prokaryotes.

Feature	Prokaryotic cells	Eukaryotic cells
Size of individual cells	less than 5µm	greater than 5µm
Genetic material	Not separated from cytoplasm	Nucleus separated from cytoplasm by
Characteristics of chromosomes	single and circular	Multiple and linear
Mitochondria	Absent	Present
Golgi apparatus	Absent	Present
Endoplasmic reticulum	Absent	Present
Location of ribosomes	Dispersed throughout cytoplasm	Dispersed throughout cytoplasm and
Cell division	Binary division	Mitosis

Two kingdoms of bacteria:

Eubacteria – “true” bacteria

Archaebacteria – oldest organisms on earth, live in extreme conditions

Bacteria Characteristics

1- Prokaryotic. 2- Unicellular.

3- Absence of Nucleus.

4- They have a rigid cell wall containing of

peptidoglycan.

5- They multiply by Binary fission.

6- They are smaller and less complex than eukaryotic cells.

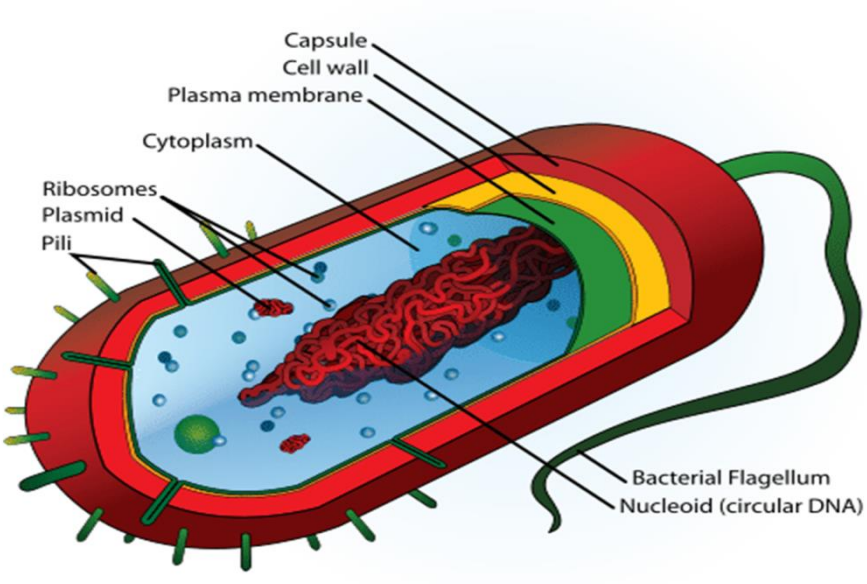
7- Genetic material is usually containing a single circular chromosome.

8- Nuclear membrane and Nucleolus are absent.

Some bacteria are useful to humans and animals, while others cause diseases, these bacteria called pathogenic bacteria which have importance in veterinary medicine.

-Atypical bacterial cell is composed of Capsule, Cell wall, Cell membrane, Cytoplasm(containing a nuclear material), and appendages such as Flagella and Pilli .

-Some bacteria can produce a dominant form called spores or endospores which resist to environmental condition.



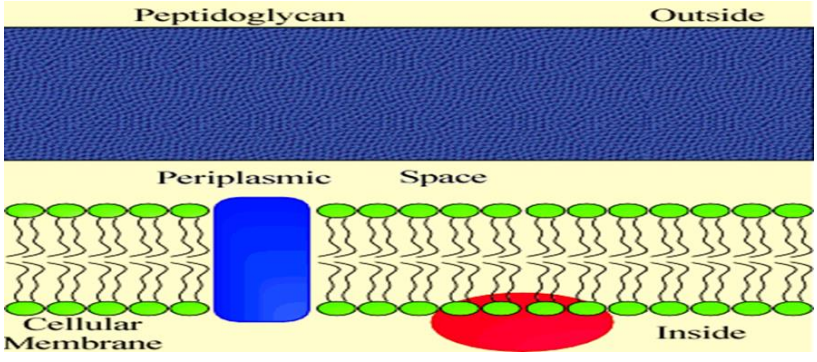
The Structure of Bacterial cell

Chemical composition and functions of structure of bacterial cell

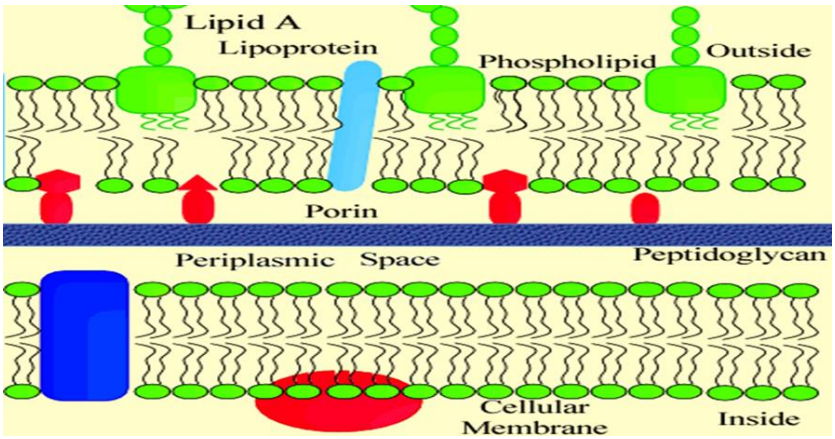
Structure	Chemical composition	Functions
Capsule	Polysaccharide	Resist to phagocytosis
Cell wall	-Peptidoglycan in gram positive bacteria -Lipopolysaccharide in gram negative bacteria	1.Give the cell definite shape. 2. Protect cell against osmotic shock and physical damage. 3. Regulation of substances transport into and out of cell.
Cell membrane	Phospholipid bilayer	Active transport of nutrients, respiration, excretion, chemoreception
Flagella	Protein called flagellin	Motility
Pili	Protein called pilin	Attachment to host cell
Ribosome	Protein + RNA	Protein synthesis

Structure of Cell wall

Gram positive = purple because of large amount of peptidoglycan in cell wall.

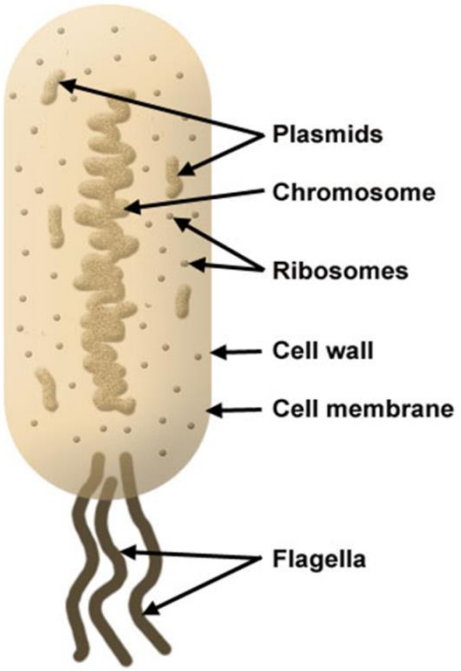


Gram negative = pink because¨ lipopolysaccharide membrane is removed by alcohol and thin peptidoglycan layer allows dye to escape.



Bacteria contain:

- a singular, circular piece of DNA
- tiny circular pieces of DNA called plasmids
- ribosomes



Flagella

Flagella are arranged in different patterns:

1. Monotrichous, a single flagellum is located at one end of the cell.

2. Lophotrichous, many flagella are grouped at one end of the cell.

3. Amphitrichous, a single flagellum is located at both ends of the cell.

4. Peritrichous, flagella are located all around the cell.