

Lecture 2:

- * **Structure and shape of bacteria,**
- * **Cell wall of gram negative and positive bacteria**
- * **Chemical composition.**
- * **Secondary structure of bacteria cell.**
- * **Flagella types , position .**

Shape of bacteria

Bacteria have different Shapes

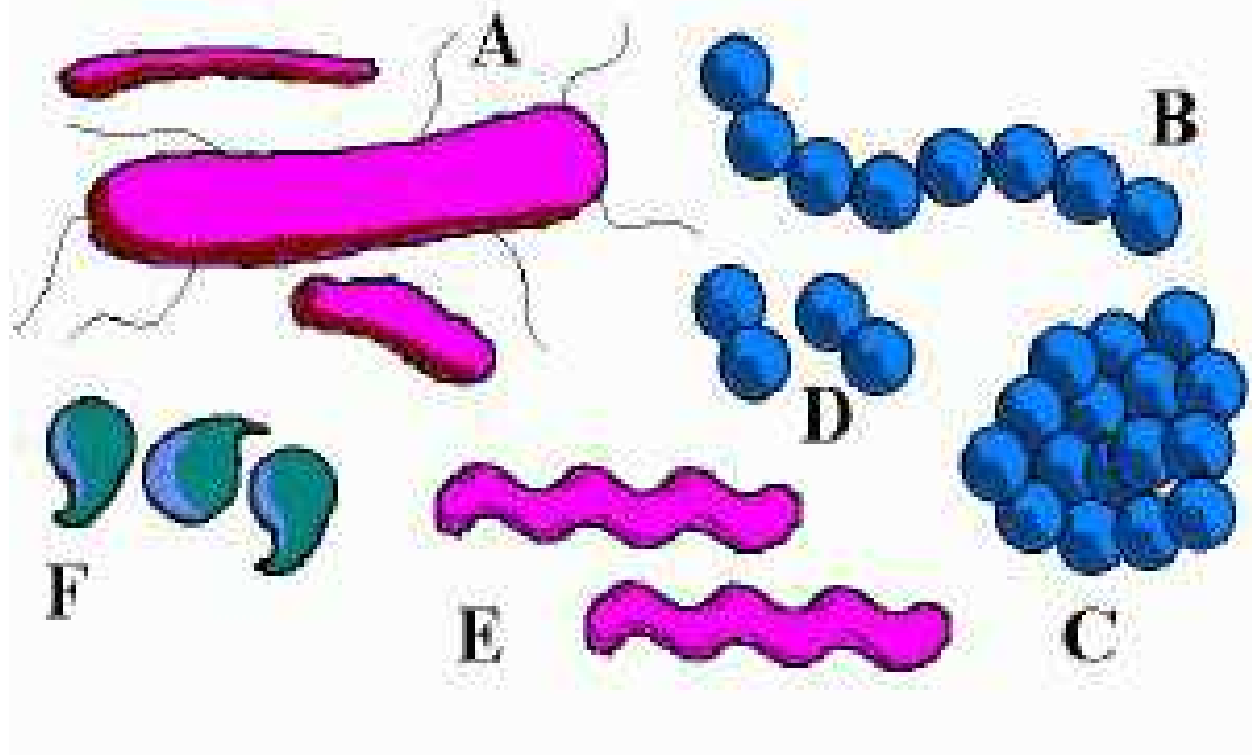
1. **Coccus:** The cocci are spherical or oval bacteria e.g. staphylococcus, diplococcus; two cells together
2. **Rod:** shaped bacterium or Bacillus, e.g Escherichia coli.
3. **The spiral:** Spirals come in one of three forms, a vibrio, a spirillum, or a spirochete

Bacterial cell “shapes”

A=bacillus or bacilli

B= round, coccus, cocci, in chains “Streptococcus) C. Staphylococcus – clusters D= diplococcus

E=Spirillum, spirilla , F= vibrio, more comma shapespirochete is a corkscrew shape d



Bacterial cell “shapes”

Structure of bacteria

Major Structures of a Bacteria Cell

Nucleoid: A ring made up of DNA ,no real complete nucleus

Cytoplasm:Clear jelly-like material that makes up most of the cell

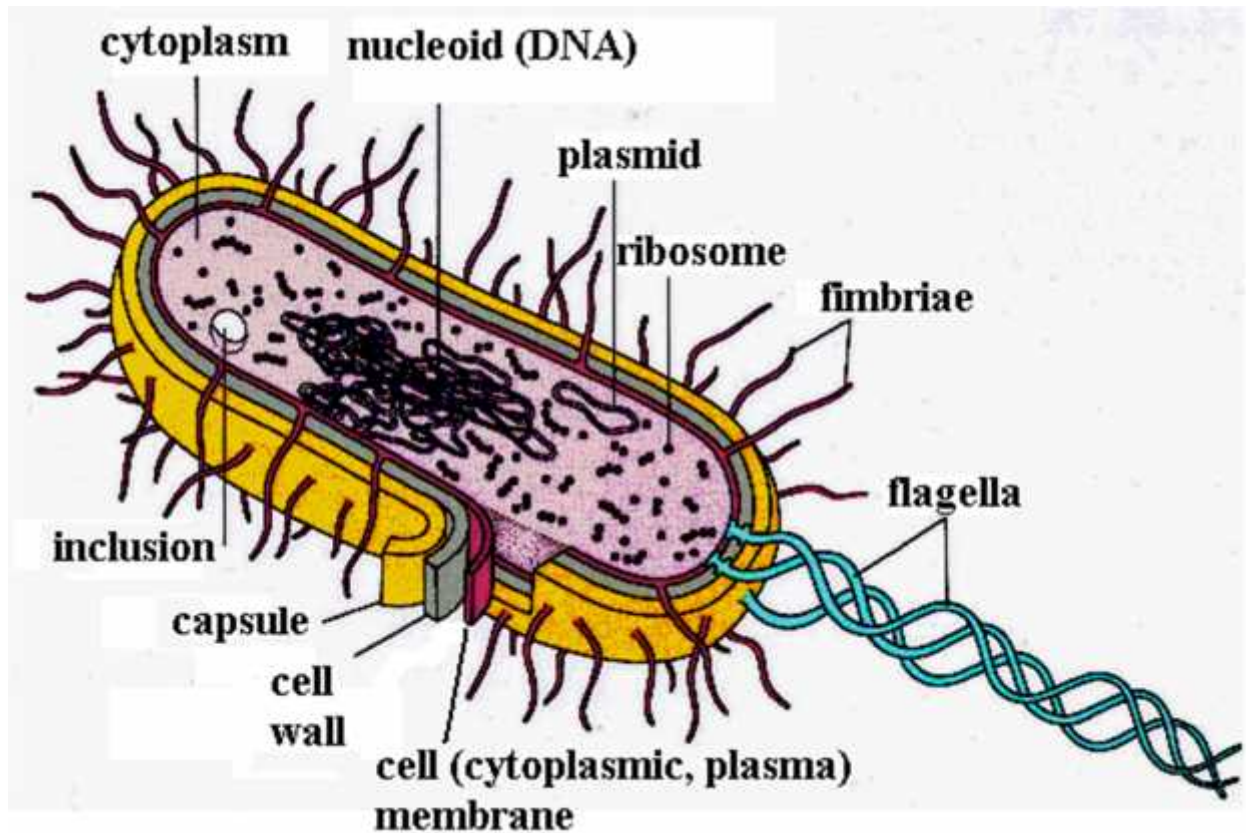
Capsule:keeps the cell from drying out and helps it stick to food or other cells

Cell wall:Thick outer covering that maintains the overall shape of the bacterial cell

Ribosomes :Ribosomes give the cytoplasm of bacteria a granular appearance and it is where proteins are made

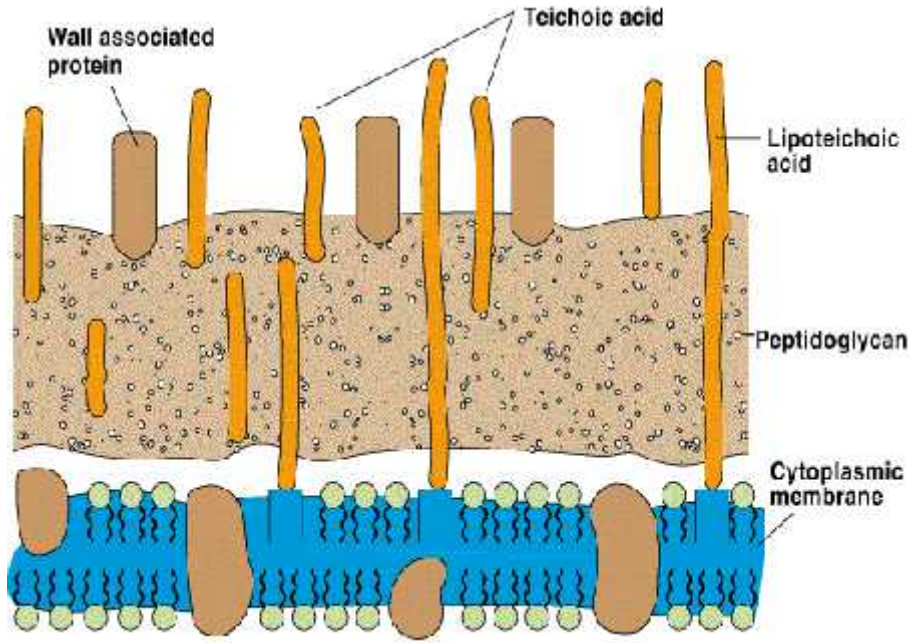
Flagella:A whip-like tail that some bacteria have for movement

Pilli:Heavy hair-like structures made of protein, allows bacteria to attach to other cells

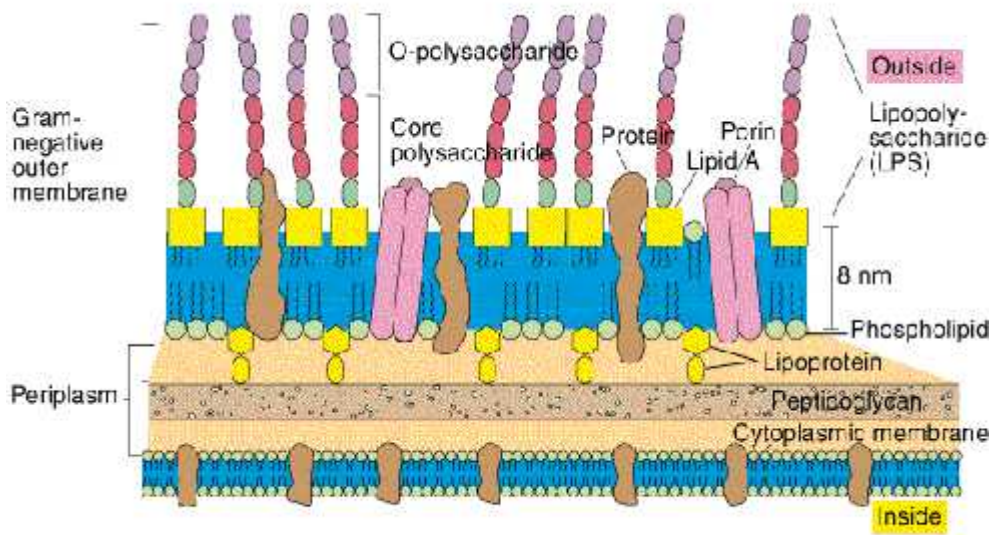


Cell wall:

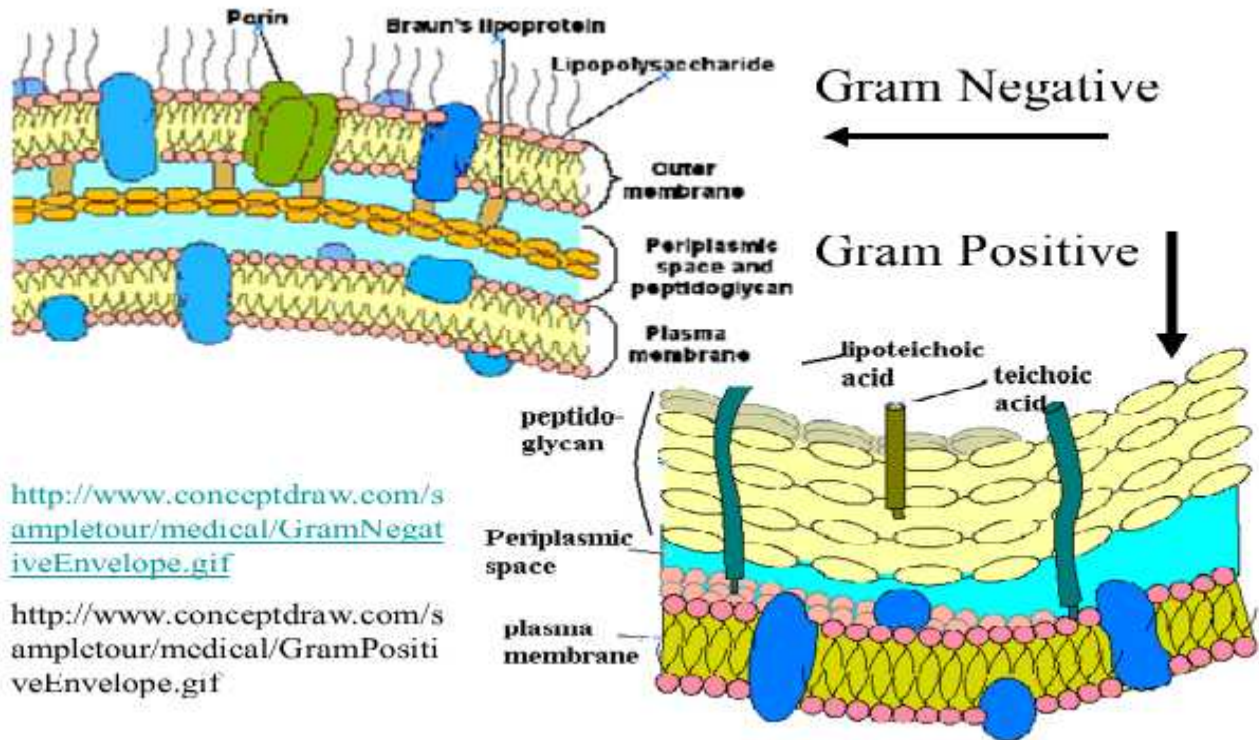
- Stain is valuable in identification.
- Gram positives stain purple; Gram negatives stain pink.
- **Gram positives** have a **thick peptidoglycan layer** in the cell wall;
- **Gram negatives** have a **thin peptidoglycan layer** and an **outer membrane**.
- Function and Structure of peptidoglycan
- Provides shape and structural support to cell
- Resists damage due to osmotic pressure
- Provides some degree of resistance to diffusion of molecules
- Composed of polysaccharide chains cross linked with short chains of amino acids: “peptido” and “glycan”.



Structure of the Gram-positive Cell Wall

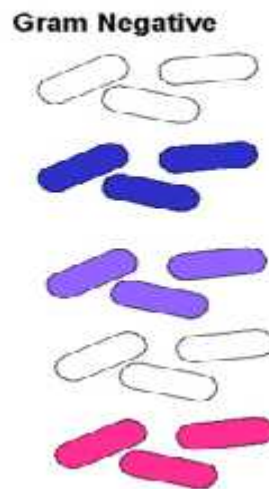
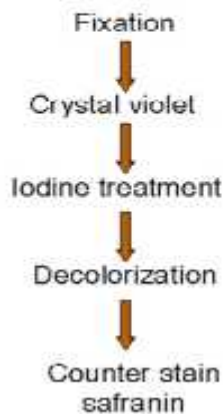
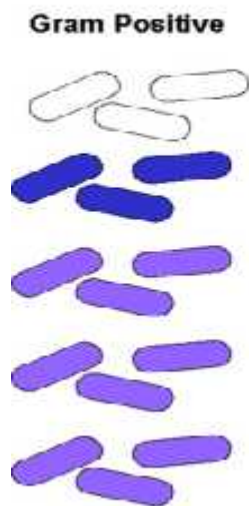


The Gram-negative outer membrane



**Division of the bacteria :
Gram Negative and Gram Positive**

Gram stain



Gram stain invented by Hans Christian Gram

Divides Eubacteria into two main groups based on stain.

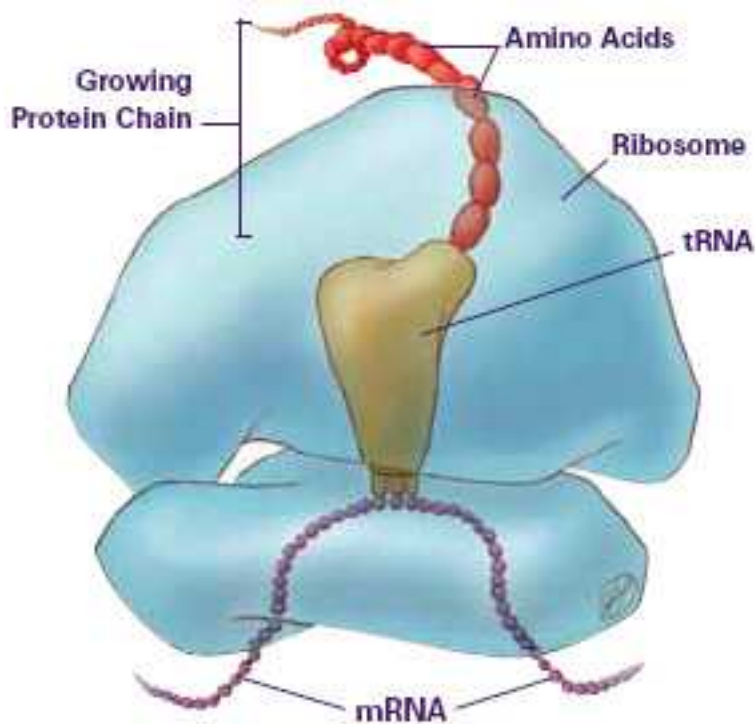
Correlates with two types of cell wall architecture.

- Grams stain = a differential stain procedure, different results, + and (-)



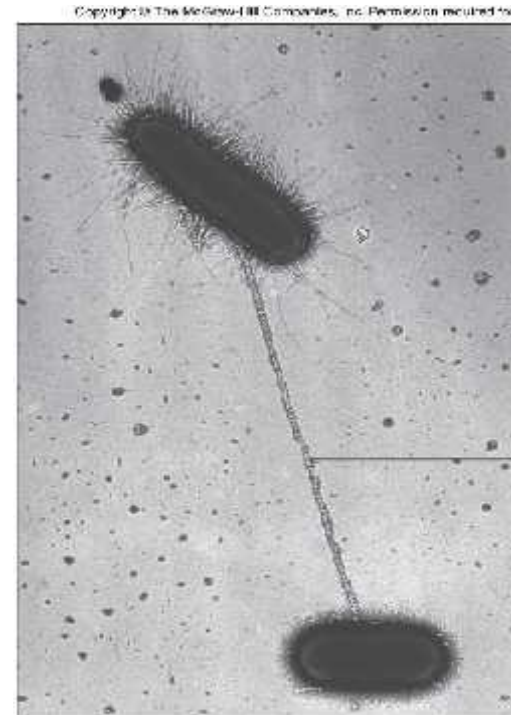
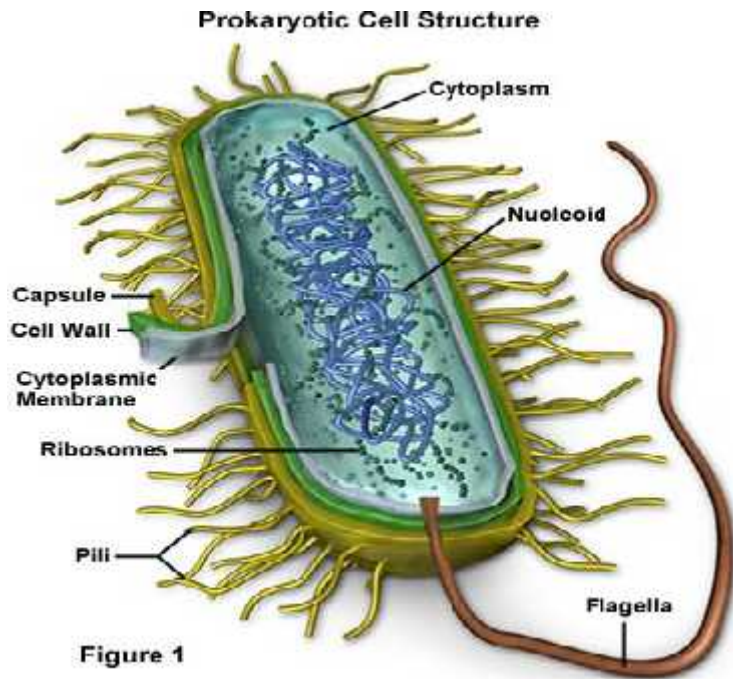
Ribosome:

Ribosomes give the cytoplasm of bacteria a granular appearance and it is where proteins are made smaller ribosome than eukaryotes, same function: protein synthesis, structure made of RNA.



Pili (fimbriae) :

Pilli are short, hair-like, protein: function of pili is attachment of host tissue , and the sex pilus – conjugation stick to each other, stick to surfaces

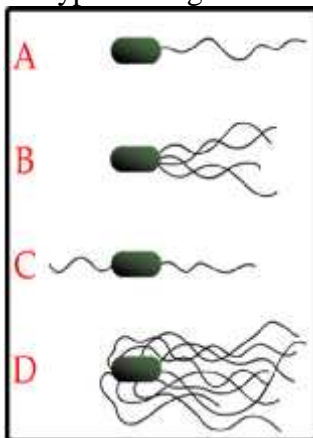


Flagella: A whip-like tail that some bacteria have for movement Flagella: complex organ of motility.

Type of Flagella

A = monotrichous B = amphitrichous C = lophotrichous D = peritrichous

Type of Flagella



structure of flagella

