

معمل التركيب الدقيق

للكائنات الحية

“ 222 MIC ”

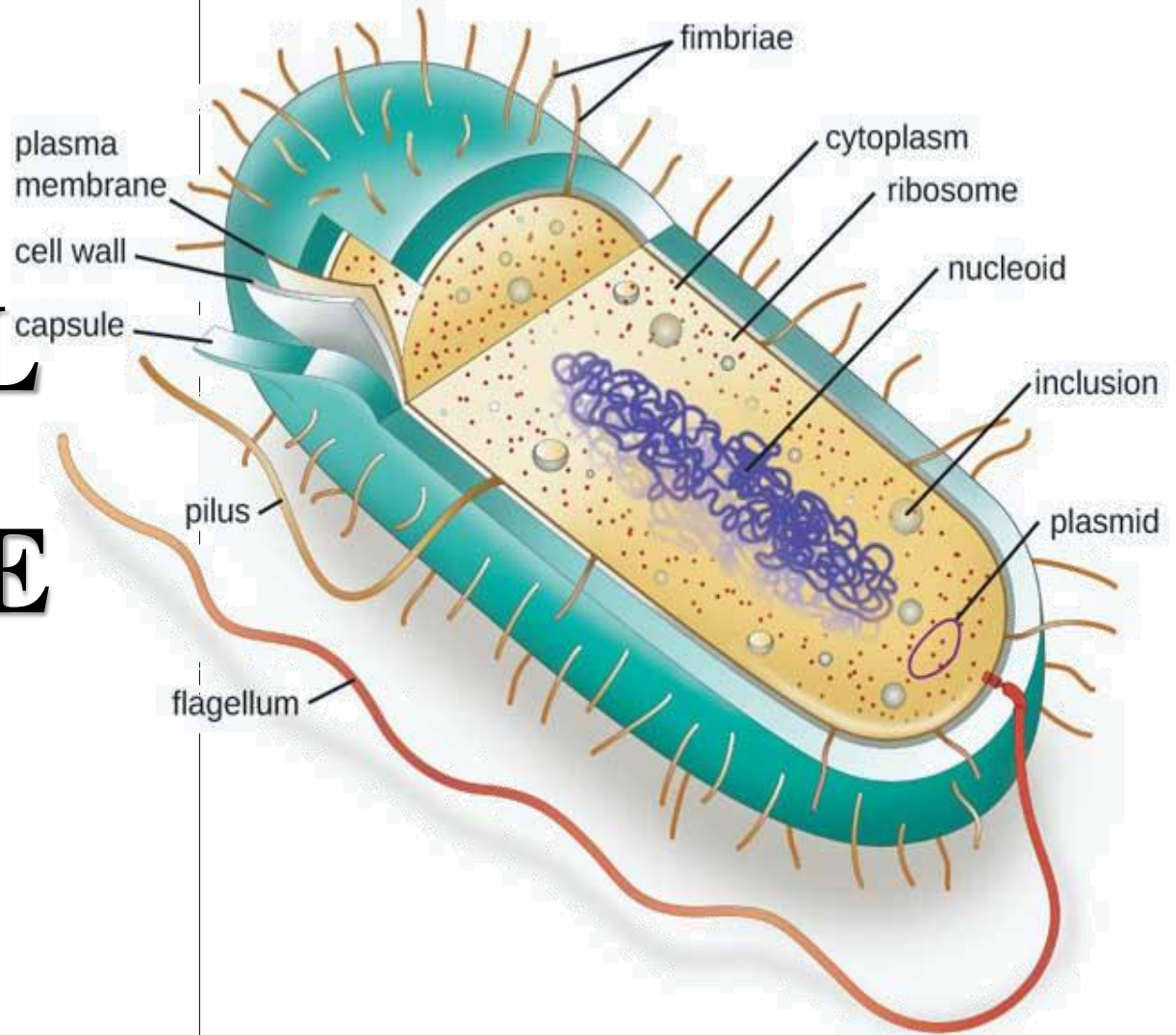
المعمل الثاني

نورة الكبيسي

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2021

BACTERIAL STRUCTURE



1. Function of Bacterial Cell Structure?

Mechanisms of virulence

Drug development

Identification



2. Essential structures

Cell wall

Cell membrane

Cytoplasm

Nuclear material



3. Particular structures

Capsule

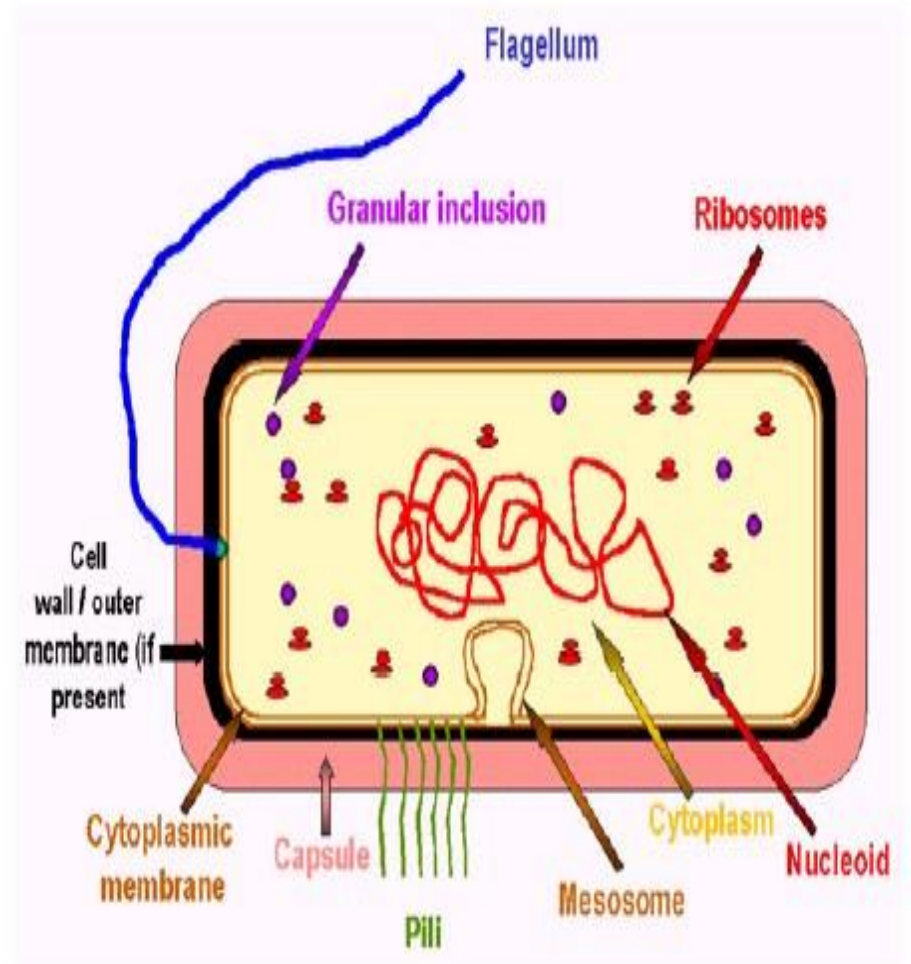
Flagella

Pili

Spore



BACTERIAL STRUCTURE (CELL WALL)



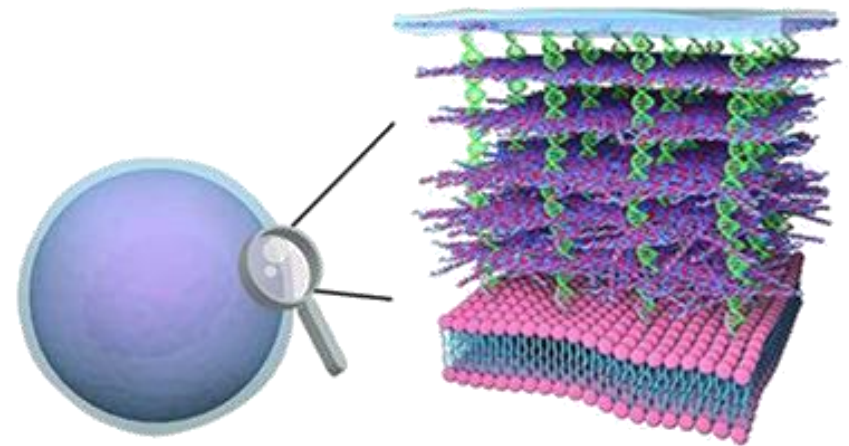
CHARACTERISTICS AND FUNCTIONS OF CELL WALL

Outer most portion /Barrier.

Protection from turgor pressure.

Gives shape.

Surrounds plasma membrane.



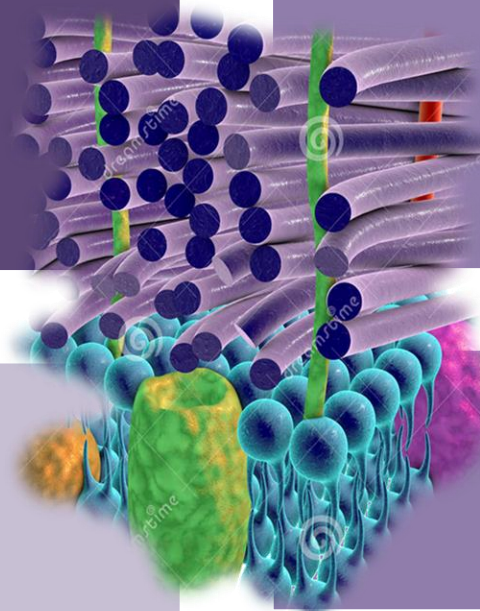
COMMON CELL WALL COMPONENTS

Peptidoglycan (murein layer, polysaccharide).

N-acetyl muramic.

N acetyl glucosamine.

amino acids.



CLASSIFICATION BASED UPON STAINING

Gram Positive vs Gram Negative:

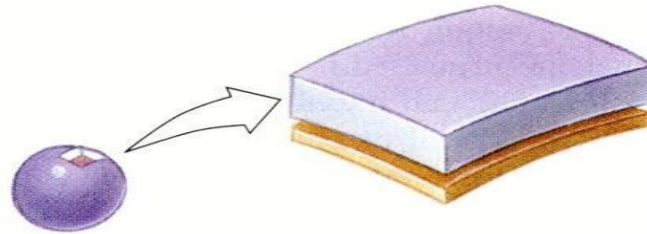
- 1 Hans Christian Gram (1884) differentiate between Positive and Negative.
- 2 It is the most important differential stain used in bacteriology because **it classified bacteria into two major groups:**

| Gram positive structure | Gram negative structure |
|----------------------------------|---|
| - appears violet after staining. | - appears red after staining. |
| - Thick layer of peptidoglycan. | - Inner vs outer membranes. - lipopolysaccharide and endotoxins. |

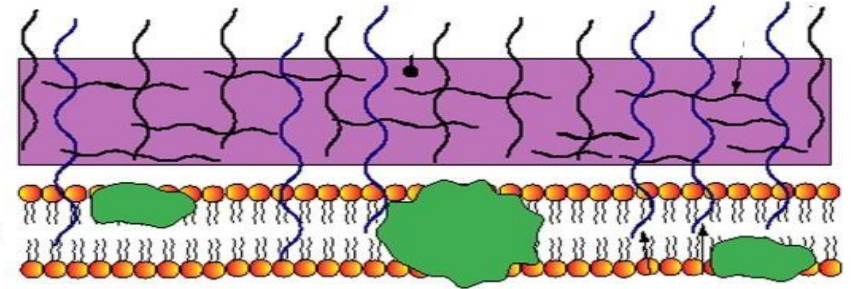
Acid fast staining *Mycobacterium*.

- Gram-positive bacteria have simpler walls with a large amount of peptidoglycan

Gram-positive cells

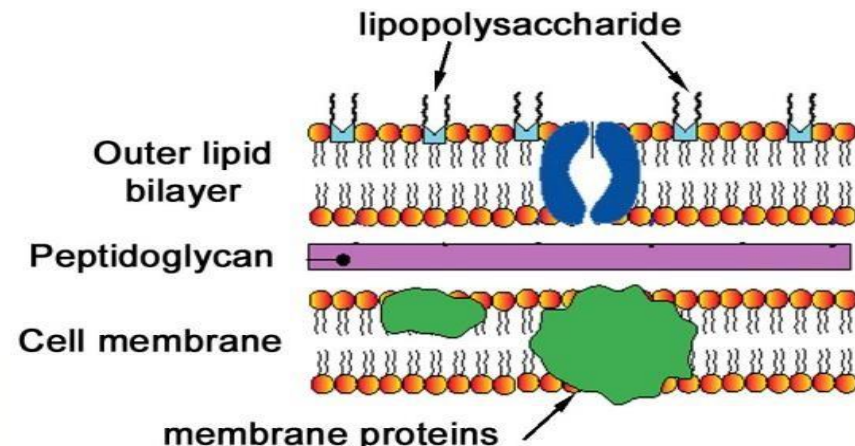
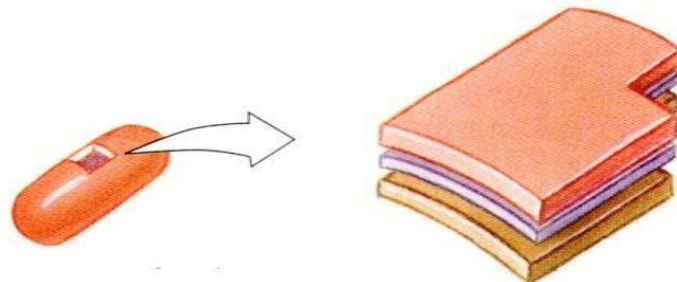


Thick Peptidoglycan Layer
Cell membrane



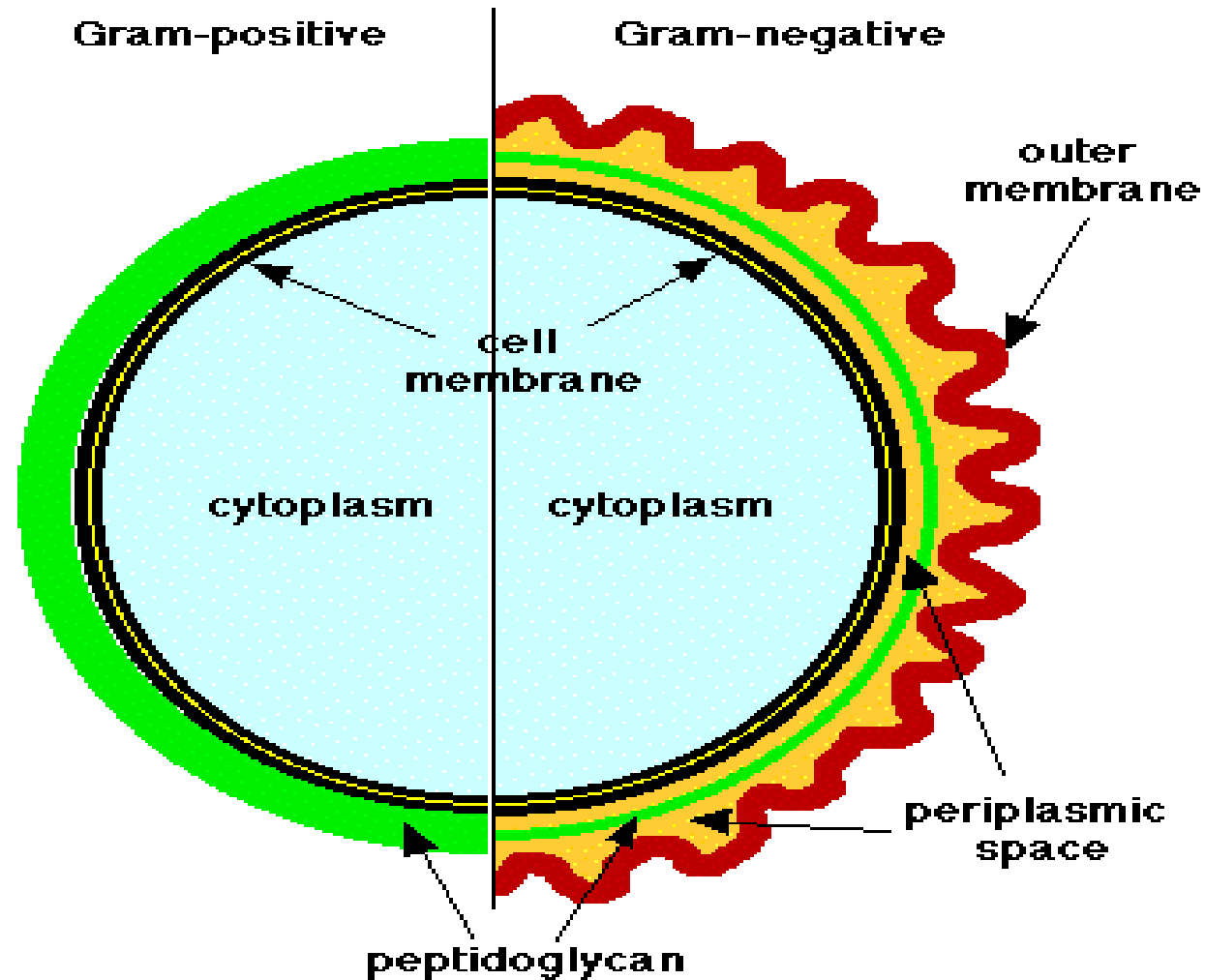
- Gram-negative bacteria have less peptidoglycan and an outer membrane that can be toxic.

Gram-negative cells

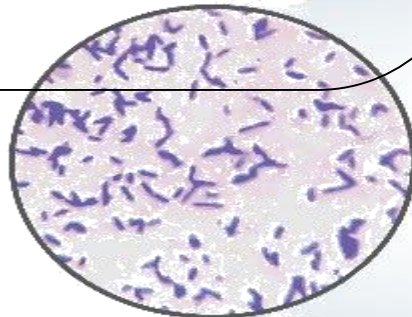
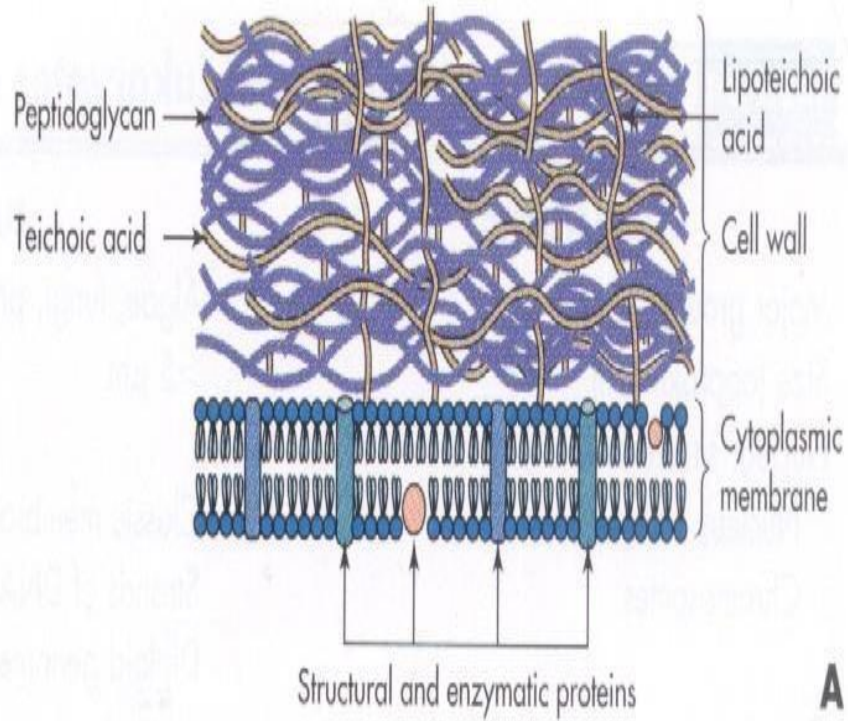


➤ CELL WALL IDENTIFICATION

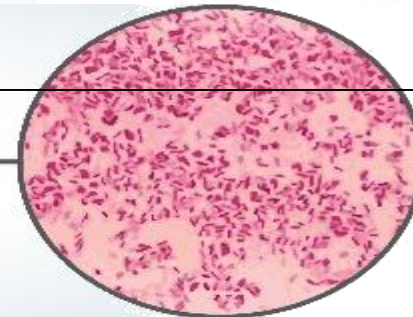
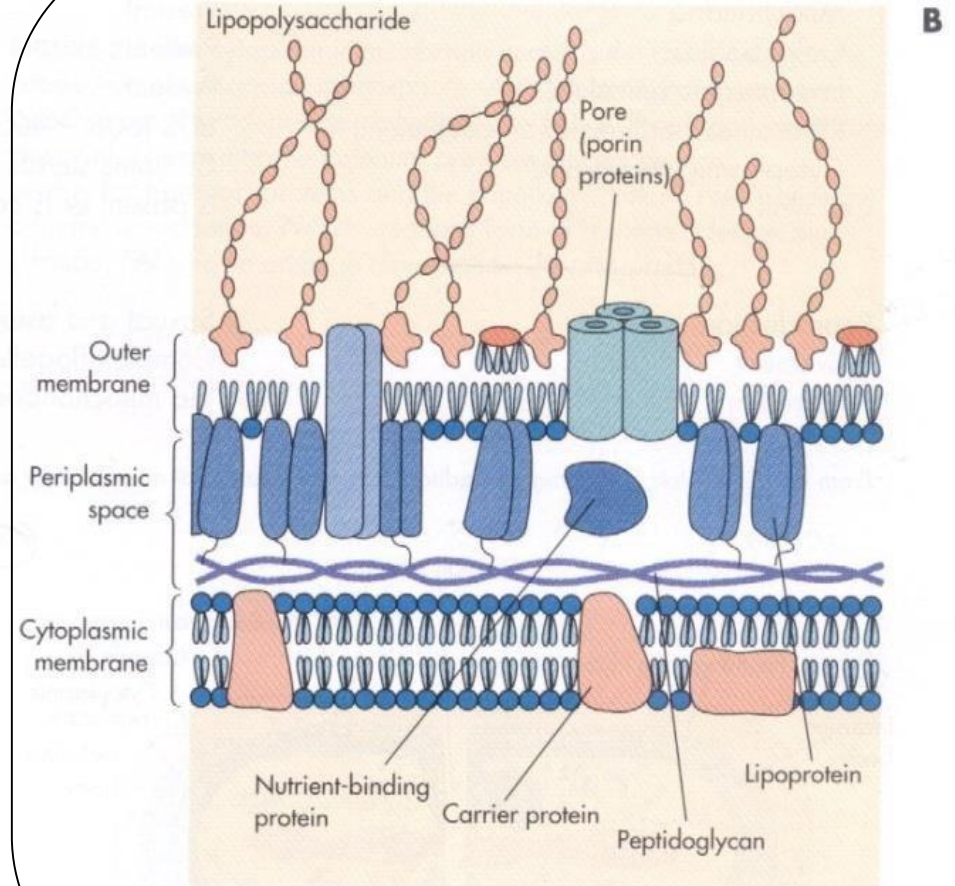
1884: Christian Gram: First publication for the Gram stain method



GRAM POSITIVE



GRAM NEGATIVE



VS

STEPS

1- Prepare your clear slide and put one drop of H₂O .

2- Take specimen from the colony and mix it well with water or normal saline.

3- Leave for dryness on air then fix it on burner.

4- Then pour Crystal Violet stain on the slide and leave it for 1 minute.

5- Wash gently with water.

6- Then pour Iodine on the slide and leave it for 1 minute.

7- Wash gently with water.

8- Wash with Alcohol to decolorize the slide.

9- Then pour Safranin stain on the slide and leave it for 1 minute.

10- Examine the finished slide under a microscope.

نهاية المعمل الثاني

