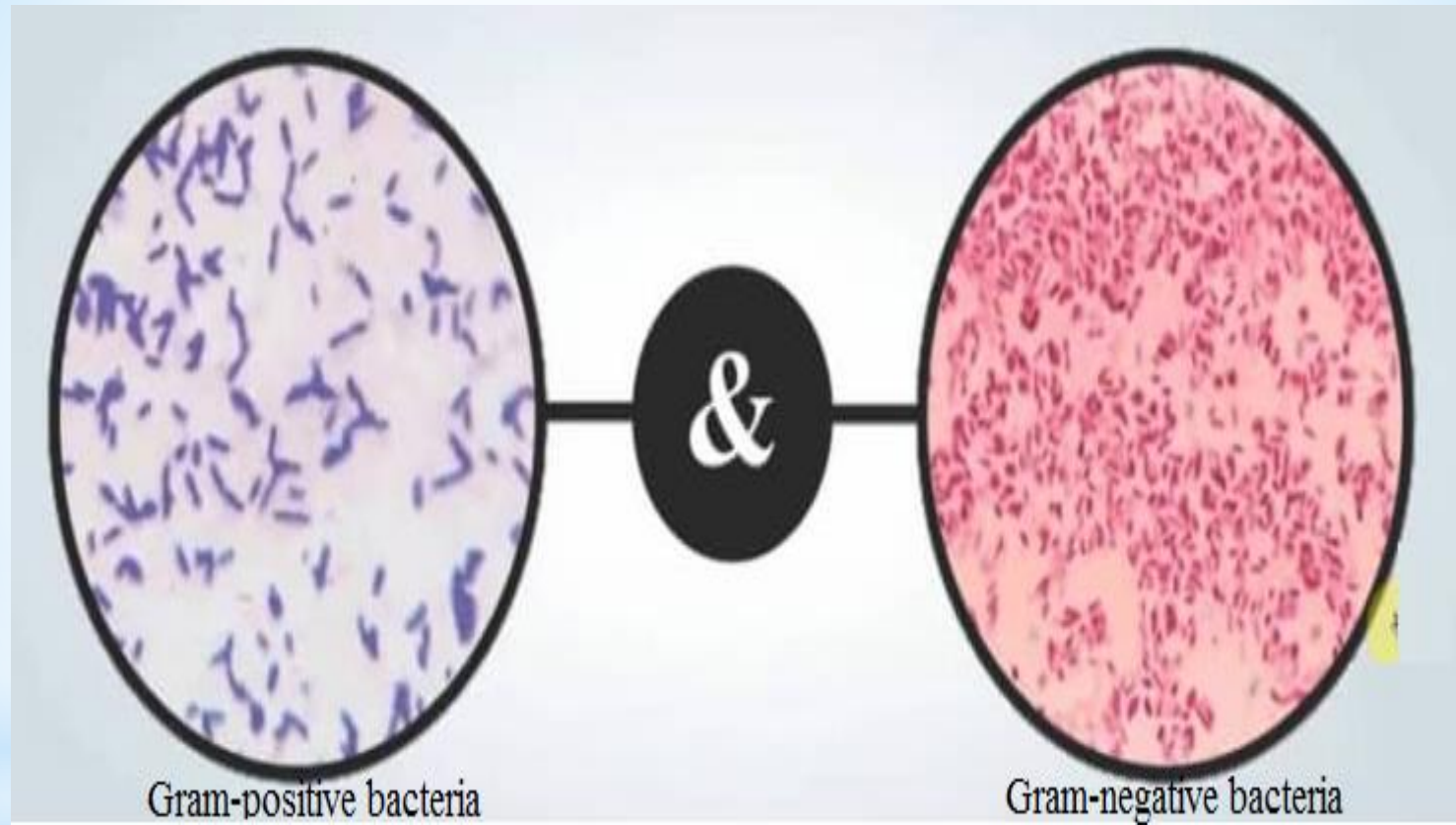


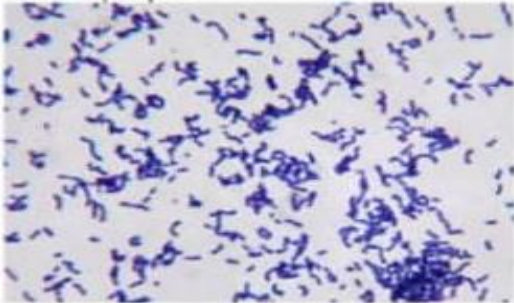
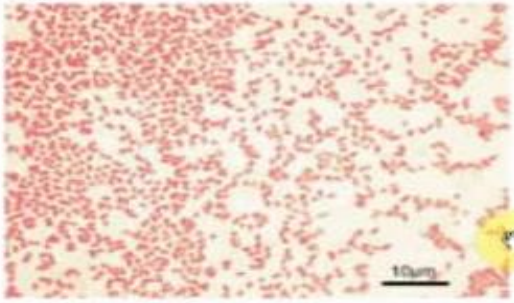
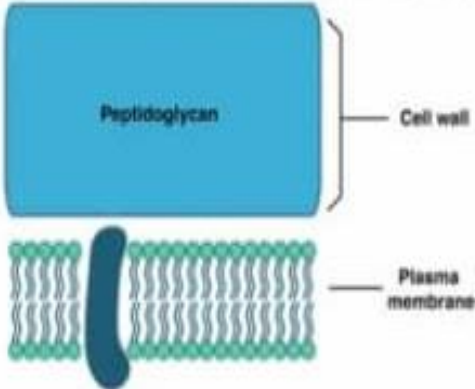
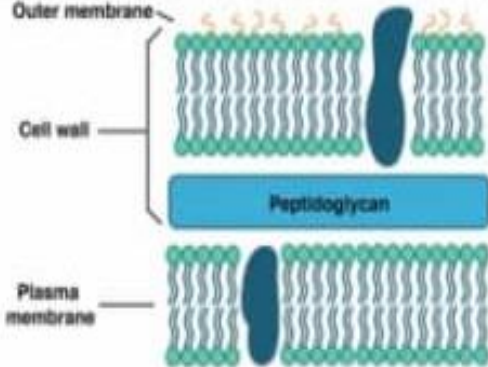
# Biology

تقنيات التخدير المرحلة الاولى

**Lab 9 Gram stain**

- Gram stain is one of the most important types of dye used in hospitals to identify bacteria.
- Discovery by Hans Christian Gram.
- The method helped to differentiate the types of bacteria.
- One type of bacteria giving red color is called (Gram-negative bacteria) and the other giving blue color is called (Gram-positive bacteria).
- The color of the bacteria in a Gram stain depends on the chemical composition of the wall of the bacteria cell.

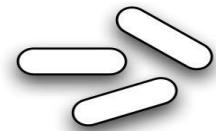


| Characteristics     | Gram Positive                                                                                                                                                               | Gram Negative                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gram Reaction       | <p>Retain crystal violet dye and stain blue or purple.</p>  <p>Gram Positive Bacteria</p> | <p>Accept safranin and stain pink or red.</p>  <p>Gram Negative Bacteria</p> |
| Cell Wall Structure | <p>Structure of Gram-Positive cell wall</p>                                              | <p>Structure of Gram-Negative cell wall</p>                                 |
| Cell Wall Thickness | Thick (20-80 nm)                                                                                                                                                            | Thin (8-10 nm)                                                                                                                                                  |

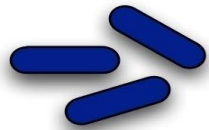
# Method

GRAM-POSITIVE

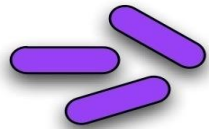
GRAM-NEGATIVE



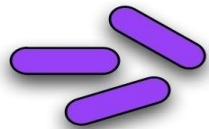
Fixation



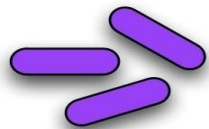
Crystal Violet



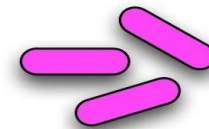
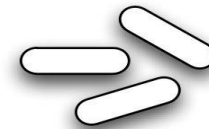
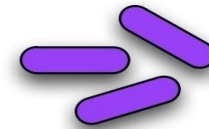
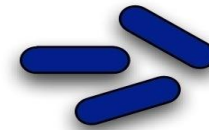
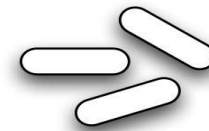
Iodine Treatment



Decolorisation



Counter stain with  
Safranin





Reacts when the dye is added

- When a crystal violet is added to the slide, the dye enters into the cell wall, and when the addition of iodine solution Iodine reacts with Crystal violet to form a compound called Crystal complex Iodine (violet).
- When alcohol is added, it enters the cell wall and If it is soluble in alcohol, it will dissolve and come out of the cell wall, thus emptying.
- when added safranin, which is red, will enter the cell wall and therefore the cell color becomes red, so the bacteria are Gram-negative
- but if the bacteria gram-positive the safranin dye will not find a place inside.

