

Bacterial structure

LAB 2

1. Why study Bacterial Cell Structure?

Mechanisms of virulence.

Drug development.

Identification.

2. Essential structures

Cell wall.

Cell membrane.

Cytoplasm.

Nuclear material.

3. Particular structures

Capsule.

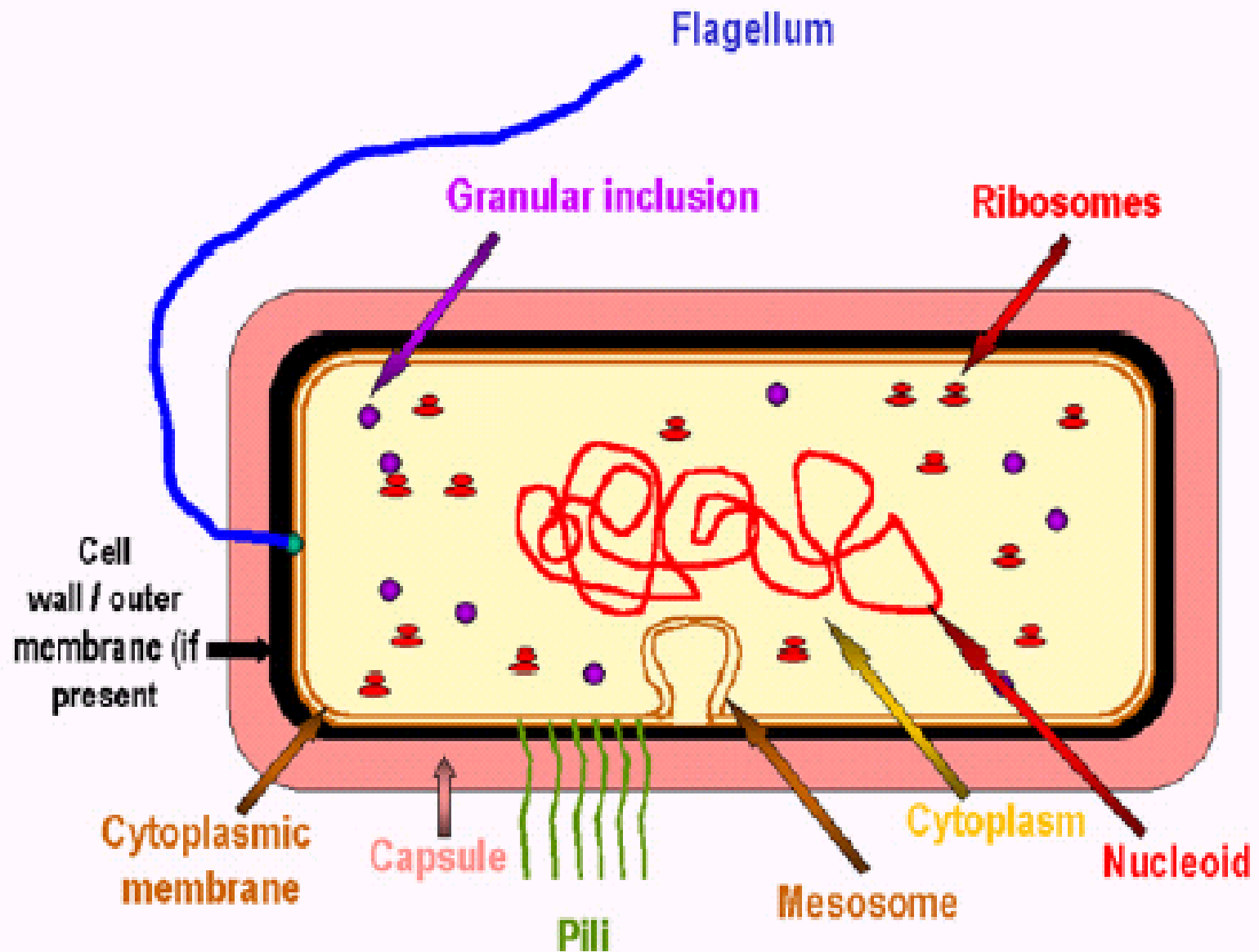
Flagella.

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, polysacharide).

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:

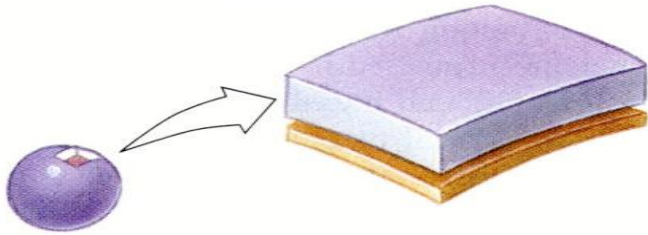
It classified bacteria into two major groups:

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

Acid fast staining *Mycobacterium*.

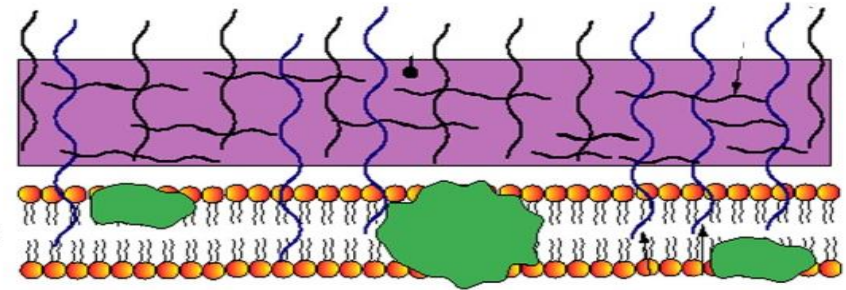
- * Gram-positive bacteria have simpler walls with a large amount of peptidoglycan
- * Gram-negative bacteria have less peptidoglycan and an outer membrane that can be toxic.

Gram-positive cells

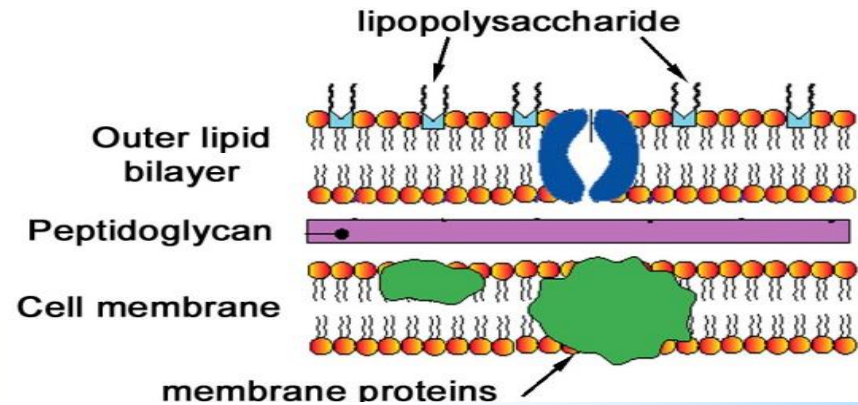
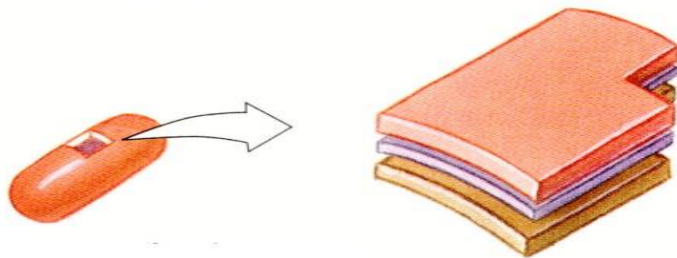


Thick
Peptidoglycan
Layer

Cell membrane

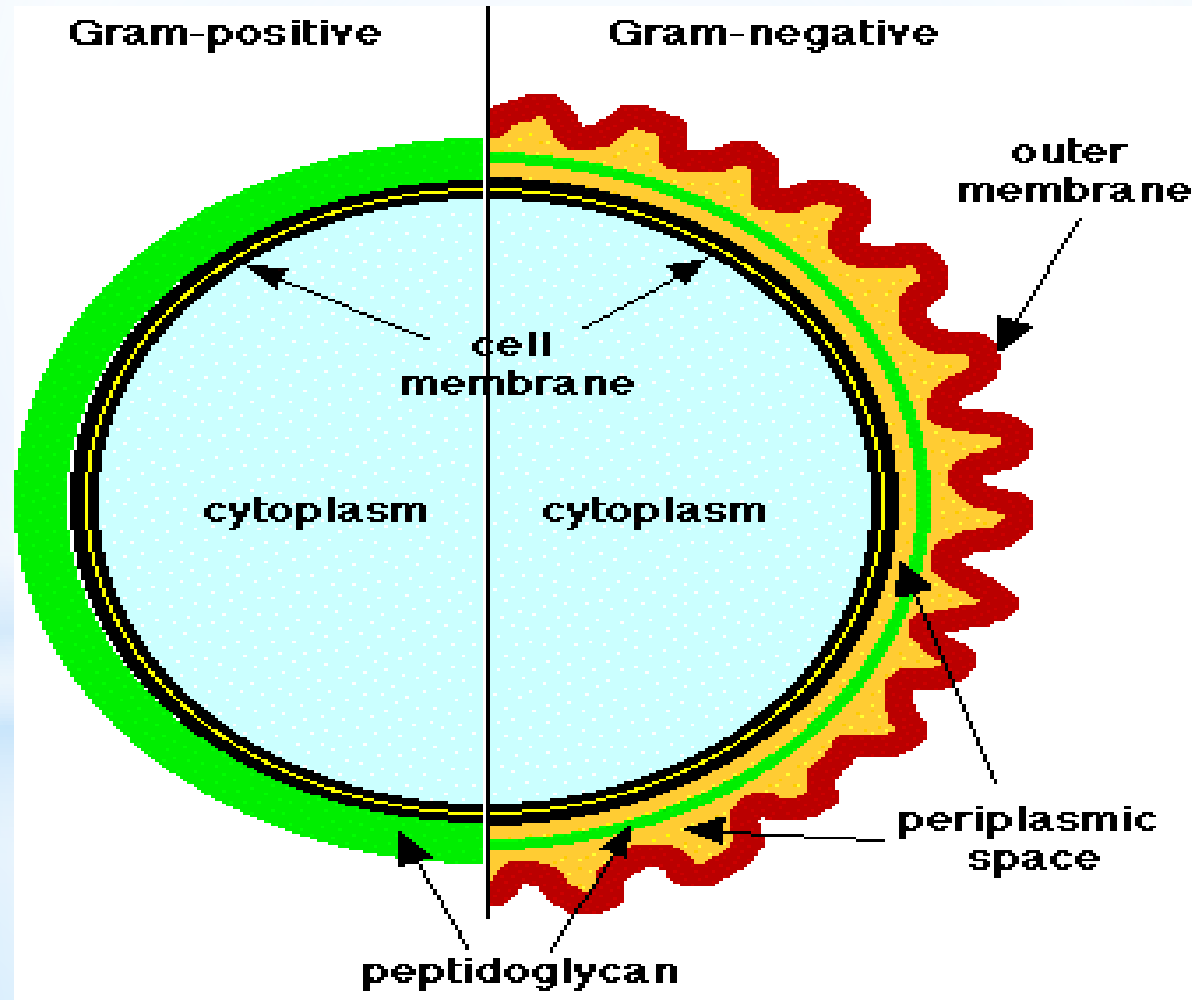


Gram-negative cells

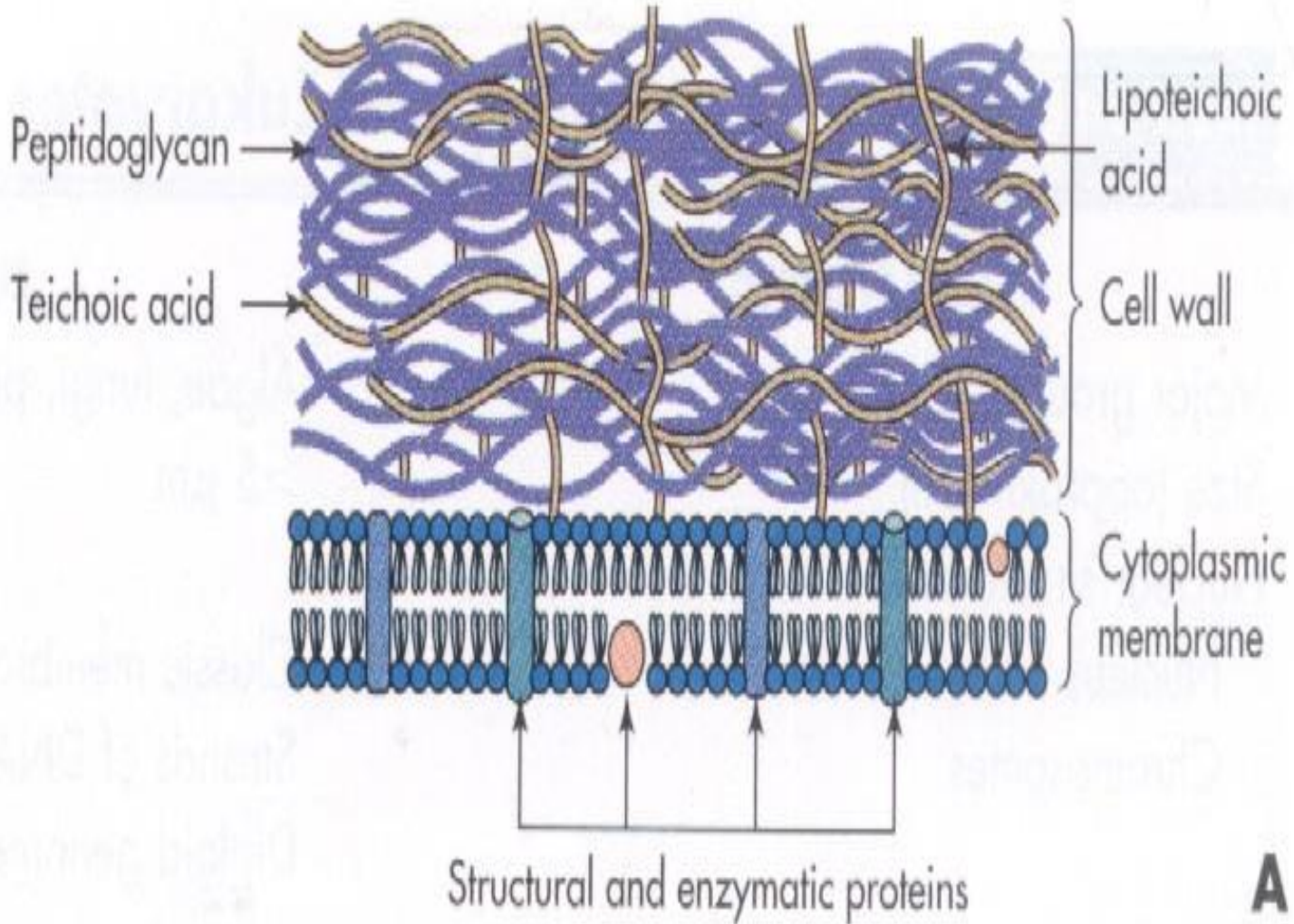


* Cell wall identification:

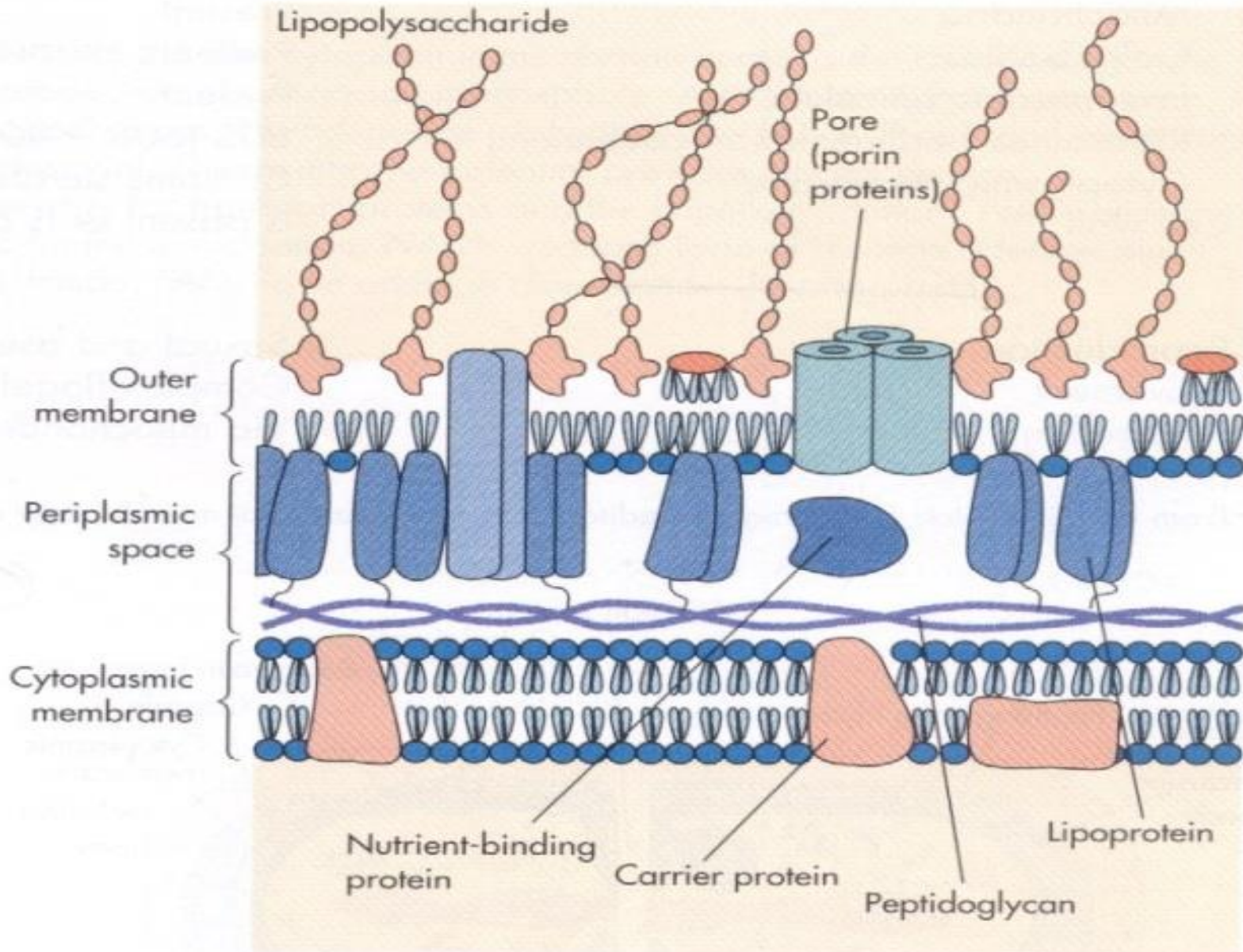
1884: Christian Gram: First publication for the Gram stain method)



Gram Positive



Gram Negative



Gram stain procedure

This stain for differentiate between G +ve bacteria (which accept staining) and G -ve bacteria (which not accept staining).

Steps:

- Prepare your clear slide and put one drop of H₂O .
- Take specimen from the colony and mix it well with water or normal saline.
- Leave for dryness on air then fix it on burner.
- Then pour Crystal Violet stain on the slide and leave it for 1 minute.
- Wash gently with water.
- Then pour Iodine on the slide and leave it for 1 minute.
- Wash gently with water.
- Wash with Alcohol to decolorize the slide.
- Then pour Safranin stain on the slide and leave it for 1 minute.
- Examine the finished slide under a microscope.