

# **Bacteria**

## **(staining of bacteria)**

### **Morphology of bacteria:**

- 1) Spherical or round called: cocci
- 2) Rod called: bacilli
- 3) Coiled or spiral.

### **Arrangements of bacteria:**

#### **Cocci:**

- ▶ Single ---→ coccus
- ▶ Pairs of cocci ---→ diplococci
- ▶ Chain of cocci ---→ streptococci
- ▶ Cluster of cocci ---→ staphylococci
- ▶ Packet of 4,6,8 cocci ---→ micrococci

#### **Bacilli:**

- ▶ Single ---→ bacillus
- ▶ Pairs ---→ diplobacilli
- ▶ Chains ---→ streptobacilli
- ▶ Narrow bacilli ---→ fusiform
- ▶ Very short bacilli---→ cocco bacilli

#### **Spiral bacteria:**

- ▶ One rigid curve ---→ spirilla
- ▶ Several curves (waves)---→ spirochaetes
- ▶ Short, curved bacteria ---→ comma shape

**Staining of bacteria:**

Stain (dye): It is a salt in which one of the salt ions (-ve or +ve) is colored.

Ex. : Methylene blue.

Basic dye: if the color is in the +ve ion of the dye.

Acidic dye: if the color is in the -ve ion of the dye.

**How to make bacterial smear?**

- ▶ The slide we use for doing the smear should be clean (no dust or oil on top of it).

Why?

- ▶ Place the slide on the slide warmer:
  1. To kill the bacteria.
  2. Fix the bacteria on the slide by coagulate the protein substance of the bacterial cells.

**Gram stain:**

Consist of 4 reagents:

1. Crystal violet: primary stain.
  2. Iodine: mordant.
  3. Alcohol or acetone: decolorizer.
  4. Safranin: counter stain.
- ❖ We will see in the slide:
    - Violet bacteria: gram +ve bacteria.
    - Red bacteria: gram -ve bacteria

**Spore stain:**

Steps for staining spore are:

1. Malachite green: primary stain (strong stain).
  2. Apply heat (water bath) and leave it for 5-10 min.
  3. Safranin: counter stain.
- ❖ We will see in the slide: Red bacilli with green spores.

**Capsule stain:**

It is called Negative stain

Because the capsule made of inert polysaccharide (uncharged) so it will not be stained. Only the background and the bacteria will stain.

To stain the capsule we use:

Black India ink

OR

Nigrosin + safranin.

- ❖ We will see in the slide:

Dark background (purple) with round uncolored capsule and red bacteria inside the capsule