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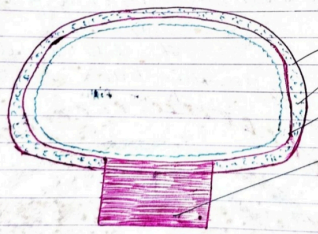
(2) **Cell Wall** ⇒ Bacterial Cells are surrounded by a wall made up of Mucopeptide, which is peculiar to bacteria. The amount of cell wall varies in two main divisions of true bacteria Commonly known as Gram +ve and Gram −ve bacteria.

In gram positive bacteria, it is major cell wall Components (85%), however in gram negative, bacteria it is present in small quantity (3 to 12%) mucopeptide. Mucopeptide is Composed of large number of alternating molecules of N-acetyl Glucosamine and N-acetyl muramic acid both being derivatives of glucose. The detailed chemical composition and structure of Gm positive and Gm negative bacteria Can be well marked by their differences given below:—

| GRAM + (POSITIVE) | GRAM − NEGATIVE |
|---|---|
| (1) Thickness ⇒ Varies from 20-80 Nm and lacks the outer lipo-polysaccharide layer i.e homogenous. | Thickness is upto 2.5 Nm (thinner). It is suppressed between the Cell membrane and lipo—polysaccharide layer. ie it is three layered |
| (2) Chemical Compon ⇒ Mucopeptide forms major portion of the wall 85% of the dry weight rest being simple polysaccharide which are in form of Teichoic acid. (It don't contain lipid). | (2) Muramic acid forms only 3 to 12% of the total dry wt. Major portion is contributed by Lipoprotein, lipid and polysaccharide. Thus it has lipid Contents but absence of Teichoic acid |

(1) **Capsule** ⇒ Some Bacteria like Bacillus anthracis and Diplococcus pneumoniae possess a thick and thin gelatinous covering out side the cell wall Called Capsule. Its function is to protect bacterial Cell from injury, to prevent complete drying of the cell and to protect from viral infection. Depending upon the thickness of the Capsule, it is named as Macrocapsule (More than 0.2 µ) and Microcapsule (less than 0.2 µ) If the Covering → is loosed, it is termed as Slime but if it is rigid and well defined, then it is termed as Capsule. Capsule is made up of polysaccharides and polypeptides of only one and some times two different amino acids.




Capsule

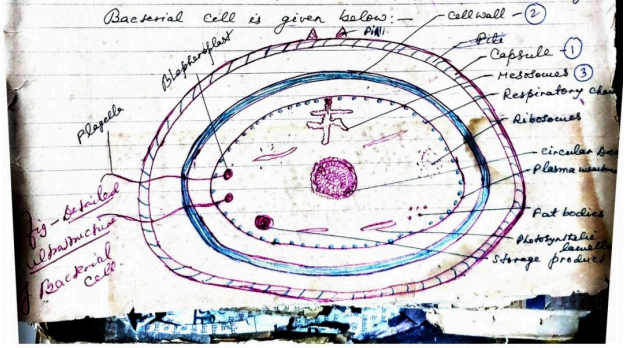
# BACTERIAL CELL

**Ques:** With the help of suitable diagram describe the electron microscopic structure of Bacterial Cell?

**Ans:** In recent 20 years, through Electron microscope the Bacterial Cell has been studied in detail. It reveals that it is prokaryotic in Cellular Organisations being complicated and following main structures are visible:-

1. Capsule
2. Cell wall
3. Plasma membrane (Mesosomes)
4. Cytoplast - a) Ribosomes
   b) Flagella
   c) Pili
5. Nucleoid
6. Special Structures - i) Endospore
   ii) Stalk

The detailed ultrastructure of Bacterial cell is given below:-

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