

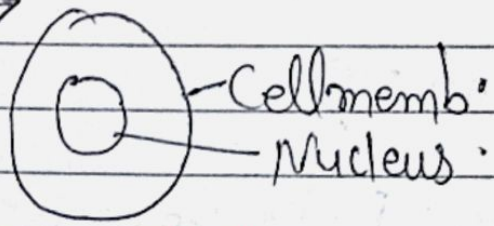
Classification of Microbiology



[DEPTH OF BIOLOGY]

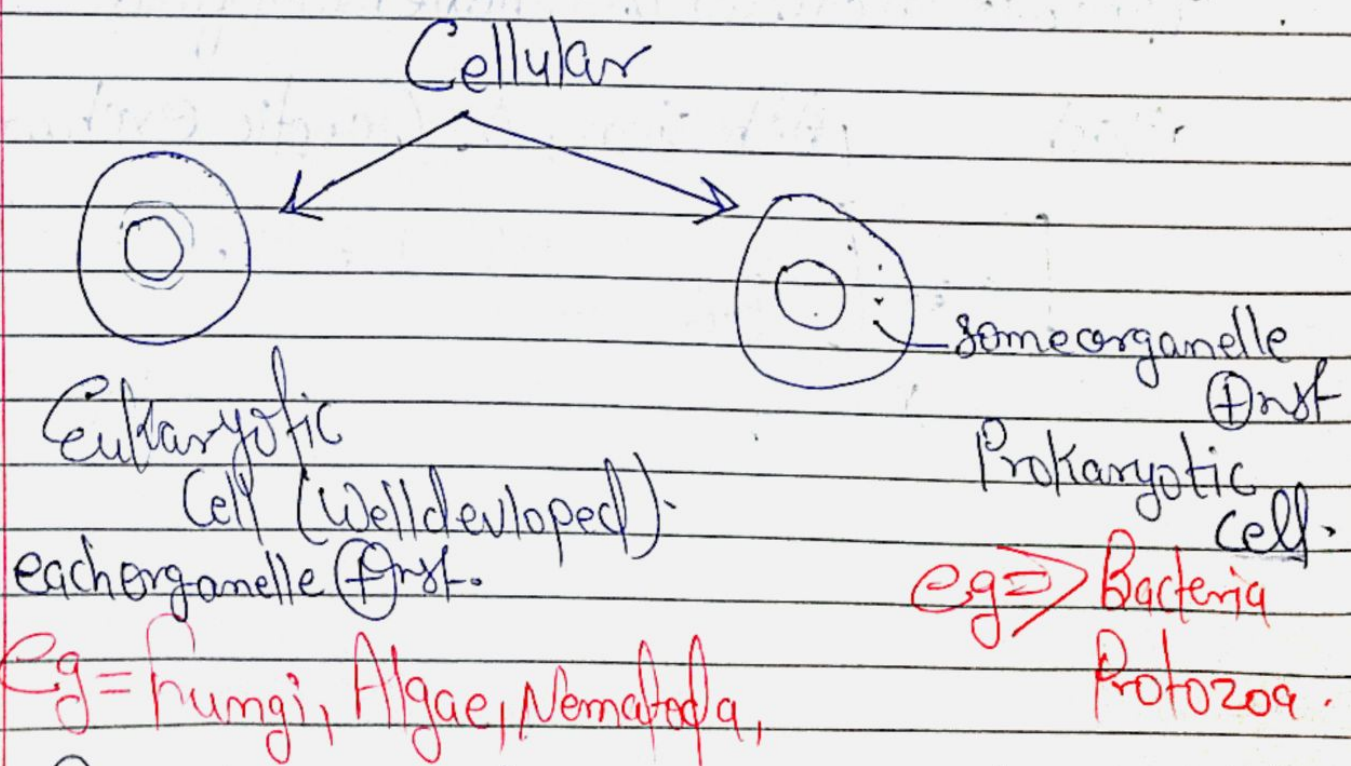
① Acellular → Not made up of cell. or divide into cells
or lacking intact cell. (not alter)
(not broken)

② Cellular →

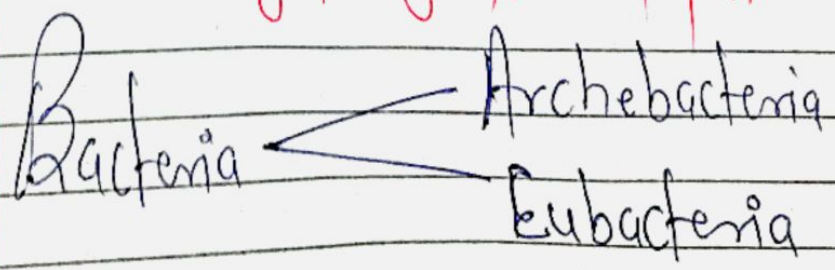


[DEPTH OF BIOLOGY]

Microbes → Cell.
Acell. ⇒ Virus.



[DEPTH OF BIOLOGY]



Date / /



Reproduce mainly by fission.

Bacteria/Eubact. ⇒ True Bact.

⇒ Most abundant Microorganism.

Simple form Complex behaviour.

⇒ Monera of Sole

Most extensive Metabolic Activity.

Cell wall = Peptidoglycan/Murien.

Nutrition in Bact. ⇒ Autotroph ⇒ Phototroph / Chemotroph

⇒ Heterotroph = Most of Bacteria.

eg ⇒ Lactobacillus.

Some are pathogen. Caused damage to human being.

Reprodno ⇒ Binary fission = Most Common (20-30 min).

Genetic Recombination in Bacteria ⇒ [DEPTH OF BIOLOGY]

~~Transformation~~ × ~~Conjugation~~ × ~~Transduction~~.

Archeobacteria ⇒ Cell wall diff. (peptidoglycan -nt)

It can grow extremely unfav. condition bcz cell wall. ⇒ oldest living Fossil

Most primitive Cellular Microorg.

Methanogen

Obligate Anaerobe

→ Founding of Ruminating animal. Cow, Goat.

for Pdm. of Methane gas Biogas, Grobar gas. Used as a fuel.

Halophiles

Ob. Ana.

→ Found in salty area. Developed pigmented memb. for Prodn. of ATP to carry out Metabolic Process.

[DEPTH OF BIOLOGY]

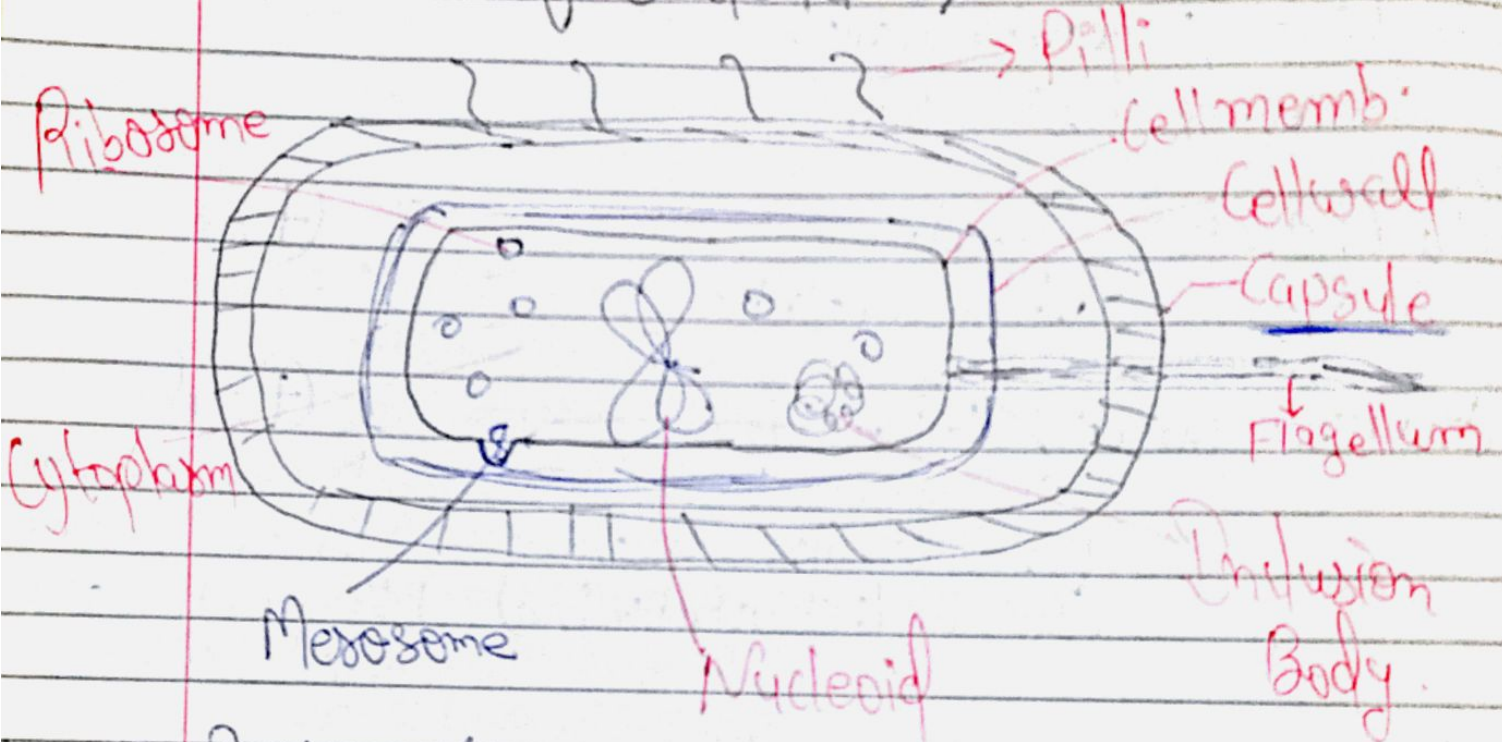
Thermophilic

Fac. Ana.

This bact. found at High Temp. at 90°C & High PH bcz due to presence of Branched chain lipid in their Cell Membr.

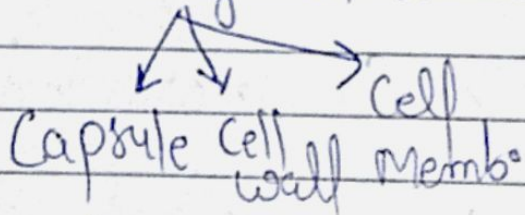


Struc. of Bacteria =>



=> Bacteria Struc. = 3 layer Struc.

[DEPTH OF BIOLOGY]

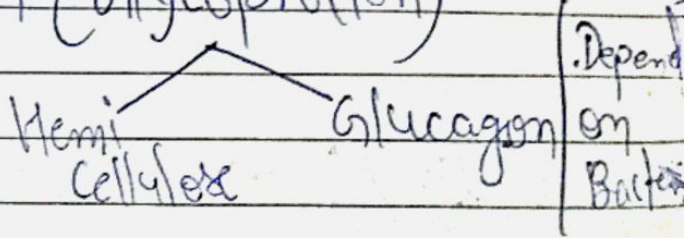


=> Bacterial Capsule show Virulence property. (घातक)

की Struc. में पानी है (98%)

[DEPTH OF BIOLOGY]

& only 2% Protein (Glycoprotein)



=> Capsule को 2 part में

divide कर सकते हैं। On the basis of their thickness

If Capsule thickness \rightarrow > 0.2 micron IIII
 \rightarrow < 0.2 micron III

> 0.2 micron (Macrocapsule)

< 0.2 micron (Microcapsule)

[DEPTH OF BIOLOGY]

Capsule \rightarrow protect the Bacteria.

\rightarrow Protect Bacteria (PHAGOCYTOSIS)
 \rightarrow Provide shape
 \rightarrow provide strength to Bacteria.

Cell Wall \Rightarrow

\Rightarrow Bacteria is Gram (+) or (-) defined with the help of Cell wall.
or identify

\downarrow
 made up of Peptidoglycan

mean (cell wall thickness) 20-80 layer \Rightarrow Gram (+)ve Bacteria.
 of Peptidoglycan

[DEPTH OF BIOLOGY]

7-8 layer of \Rightarrow Gram (-)ve Bacteria.
 of Peptidoglycan.

\rightarrow It protect the Bacteria.

\rightarrow & provide shape to bacteria.

[DEPTH OF BIOLOGY]

Composed of Lipid Bilayer.

It separates cytoplasm from surrounding.

Cell Membr. ⇒

Thin, Delicate Membrane. 8nm in thickness. ⇒ acting as a permeability barrier for most of molecules.

Cytoplasm ⇒

Provide a medium to the organelle to remain suspend.

act as buffer & protect Genetic Material of Cell.

⇒ Protein synth. also occur in cytoplasm.

(Nucleus like)

Nucleoid ⇒

(Less developed) Nucleus

(It is where transcrip. & replic. of DNA takes place)

Essential

60% DNA

30% RNA

10% Protein

for controlling the activity of cell & reprodn. (Contain all or most of genetic material)

Inclusion Bodies ⇒

are tiny particles found

Non-living Chemical Compound

freely suspended & floating within the cytoplasmic matrix

therefore also called cytoplasmic inclusions.

⇒ There are wide variety of inclusion body in diff. type of cell.

eg ⇒ Gas vacoules, Glycogen granules

⇒ In prokaryotic cell mainly form to store reserve material.

Mesosome ⇒ Extra chromosomal DNA

extension of the cell memb. (↑) in cytoplasm as infolding & serves to (↑) the surface area.

Help the cell to cellular respiration; (↑) the surface area. *Analogous to mitochondria

Date: / /

Composed of Microtubules



Flagella \Rightarrow (Single Flagellum) is a long & help.

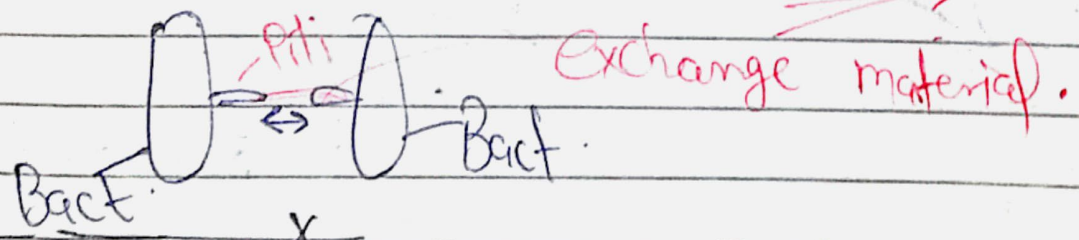
Some single cell organism to move. [DEPTH OF BIOLOGY]

\rightarrow It is primarily motility organelle that enable movement & Chemotaxis.

Maybe bacteria \rightarrow Peritrichous (several flagella all over the bacterium)

Pili / Fimbriae \Rightarrow [DEPTH OF BIOLOGY]

Are filamentous proteinaceous structure found on the surface of some bacterial cell. They extend from the surface of the bacteria cell wall & can have many function such as attachment, Adhesion, & Genetic Exchange.



[DEPTH OF BIOLOGY]

Lecture - 7



Morphological Classification of Bacteria

Free Bacteria

False/Pseudo Bacteria
 ↳ Bact. VP
 ↳ Bact. Bact
 ↳ Bact. Str

Spherical shape



Coccus

[DEPTH OF BIOLOGY]

Monococcus

Diplococcus

Tetrads

Chain like (Strepto Coccus)

Cube like (Sarcino Coccus)

Grapelike (Staphylo Coccus)

Rod

Bacillus

Monobacillus

Diplobacillus

Tetrabacillus

(Chain) Strepto bacillus

Sarcino Bacillus

(Staphylo Bacillus)

① Actinomycetes

Branches of form



↳ looks like fungi
 ↳ Gram +ve
 ↳ not mainly in soil

② Spirochater

↳ straight without branches & double memb.

Gram -ve

length \Rightarrow 3-500 microns
 ↳ Affect Human Health
 ↳ Caused z. like Syphilis

\Rightarrow Group of spiral shape bacteria

\Rightarrow They are either free living or host associated

\Rightarrow found in human oral cavity & gut

[DEPTH OF BIOLOGY]

They produce a no. of enzyme that help degrade organic plant material (Lignin & Chitin).

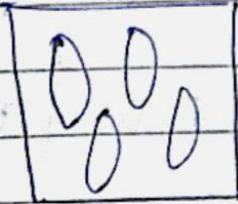
Actinomycetes ⇒ Can be Terrestrial or aquatic.

Play Imp. role in soil ecology. [DEPTH OF BIOLOGY]
Great economic importance for human.
Forms branches filamentous Hyphae.
Its hyphal diameter approx. 1 μm.

③ Mycoplasma ⇒ Looks like Virus (Jockey of microbial world) [PPLD].
↓ Gram -ve

- Wallless bacteria [DEPTH OF BIOLOGY]
- Smallest dz. causing organism.
- Pleomorphic → shape fix
- Facultative Anaerobe ⇒ Many pathogenic in Animal & Plants.
- eg = Bunchy top of Pappus (dz).

④ Rickettsia ⇒ Non-spore forming*

↓ Gram -ve Bacteria.  ⇒ Multiply by Binary fission

found in lice, mammals. ⇒ Many of them can only grow inside living cell.
& they are frequently transmitted by Mice, lice etc.

- ⇒ It has both DNA & RNA. [DEPTH OF BIOLOGY]
- ⇒ Non-Motile*

Date: / /

They are dependent on replication inside the host cell.



5

Chlamydiae \Rightarrow Oval shape

[DEPTH OF BIOLOGY]

↓
Soft cell wall \rightarrow Peptidoglycan + Imp. Protein

[DEPTH OF BIOLOGY]

\Rightarrow Affects the eye of people

\Rightarrow Gram \ominus Bact.

\Rightarrow Obligate Intracellular Parasites.