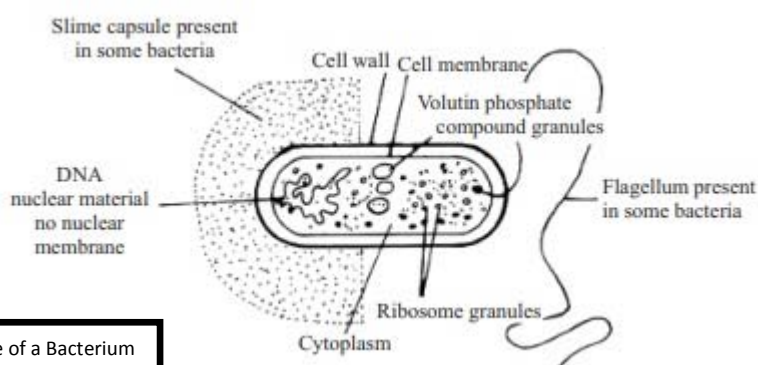


LESSON-2 THE KINGDOMS MONERA, PROTOCTISTA AND FUNGI

The Kingdom Monera which includes all the bacteria including blue-green algae (cyanobacteria) and the Protoctista which includes the protozoa, the diatoms and some algae are in a way the simplest among the living world. All bacteria, majority of protoctists and many fungi are microscopic and generally referred to as microorganisms

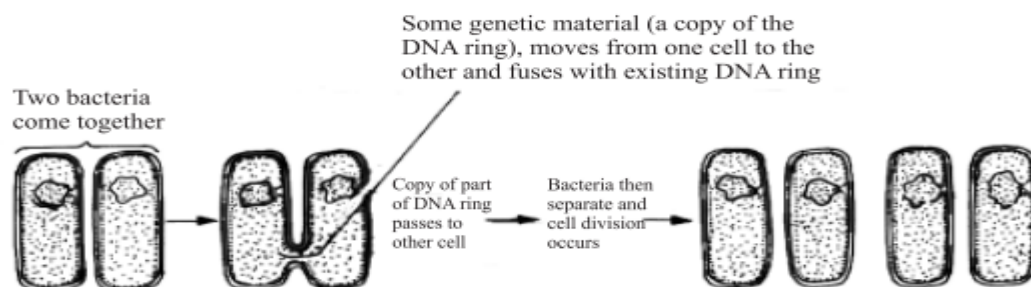
KINGDOM MONERA

- Includes the bacteria and cyanobacteria (commonly called blue-green algae). Since only bacteria are prokaryotic (lacking a true nucleus, that is without a nuclear membrane),
- Monera is the only prokaryotic kingdom.
- Prokaryotes have no nuclear membrane around genetic material and no membrane bound cell organelles except mesosomes. They have only the 70s ribosomes.



Structure of a Bacterium

- Bacteria exhibit four different kinds of nutrition - autotrophic, saprotrophic, symbiotic and parasitic.
- Some bacteria show a primitive mode of sexual reproduction. It is different from sexual reproduction in higher forms.
- Bacteria reproduce asexually by binary fission

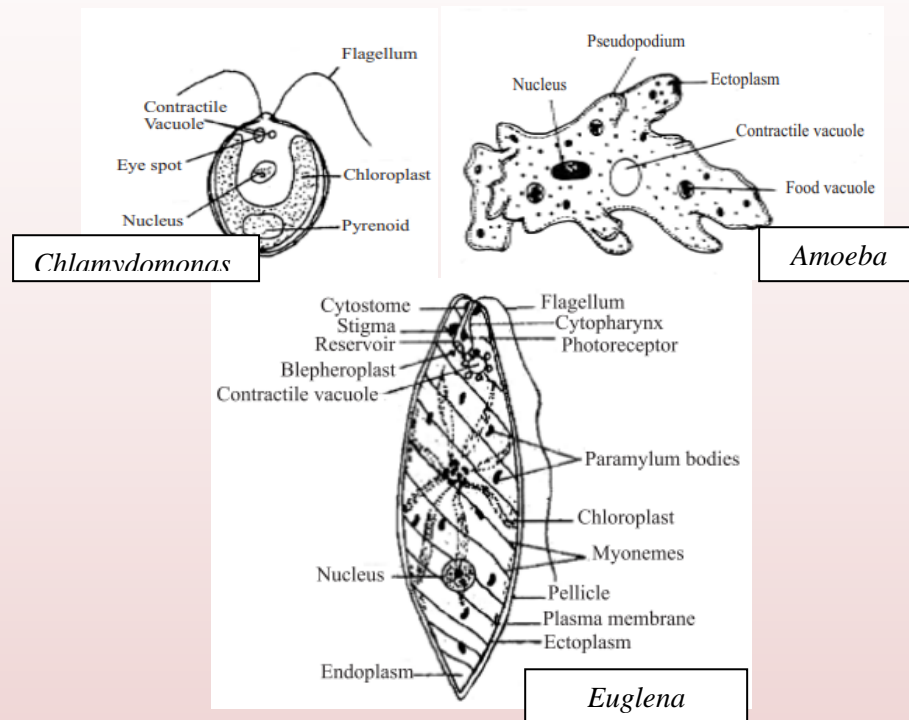


Conjugation in Bacteria

- **CYANOBACTERIA:** These were earlier called the blue-green algae. A very successful group on primitive earth, they could carry out photosynthesis and the oxygen released during the process changed the earth's atmosphere and gradually the level of oxygen increased in the earth's atmosphere.
- Kingdom Monera includes three groups, viz. 1. Archaeobacteria 2. Eubacteria, and 3. Cyanobacteria

KINGDOM PROTOCTISTA (UNICELLULAR)

- Protoctista includes protozoa, diatoms and other unicellular algae.
- They are unicellular eukaryotes and possess organelles like mitochondria, golgi, bodies, chloroplast, endoplasmic reticulum.
- Protoctists are autotrophic, saprotrophic or parasitic.
- Protozoans may have pseudopodia, cilia and flagella for movement.
- They reproduce asexually as well as sexually.
- Examples of protoctists are *Paramecium*, *Amoeba*, malarial parasite, *Chlorella*, *Euglena*, *Chlamydomonas* and diatoms.



- Some protozoa cause diseases. Algae provide food for fish, and are rich sources of some minerals and vitamins. Blue green algae fix atmospheric nitrogen. Walls of diatoms which have silica get deposited to form diatomaceous earths, which is used as filters and for lining the furnaces.
- Diatoms form bulk of plankton in ponds lakes and oceans, and are food for many aquatic organisms

KINGDOM FUNGI

- ✚ Fungi are eukaryotic, unicellular or multicellular saprotrophs having filaments which grow through soil, wood and other substrates.
- ✚ The fungi are of five main kinds
- ✚ Myxomycetes, the Slime moulds, which have irregular shape.
- ✚ Phycomycetes, are unicellular, filamentous and branched e.g. *Rhizopus* and *Phytophthora*.
- ✚ Ascomycetes, are one celled (e.g. yeasts) or multicellular branched e.g. *Aspergillus*, *Penicillium*, and *Neurospora*.
- ✚ Basidiomycetes, are multicellular, branched, and are represented by rusts, smuts, Mushrooms and toadstools, which are large enough to be seen by naked eyes.
- ✚ Deuteromycetes, are multicellular filamentous branched fungi which reproduce only by asexual means e.g. *Alternaria*.
- ✚ Lichens and mycorrhizae which exist in symbiotic associations.

- Yeasts are unicellular, which commonly reproduce asexually by budding. Yeast is used for making bread and beer.
- Sexual reproduction occurs by conjugation.
- Slime moulds are naked, creeping multinucleate mass of protoplasm.
- Lichens are symbiotic combinations of fungi and algae.
- *Rhizopus* is the common bread mould that produces whitish network (mycelium) on stale bread, in warm humid weather.
- *Rhizopus* reproduces asexually by spores, and sexually by producing zygosporangium which in turn produces haploid spores after meiosis and repeated mitotic divisions.
- Wheat rust (*Puccinia graminis*) causes brown patches on leaf and stem of wheat plants.
- Ringworm and athlete's foot are two common fungal diseases of humans.
- Certain mushrooms are edible.
- *Neurospora* is used in experiments on genetics.
- *Penicillium notatum* yields penicillin.
- Various other fungi produce other antibiotics.

Test Yourself

1. Draw a labelled diagram of a typical bacterial cell.
2. Draw a labelled diagram of Euglena.
3. List any three characteristics of fungi.