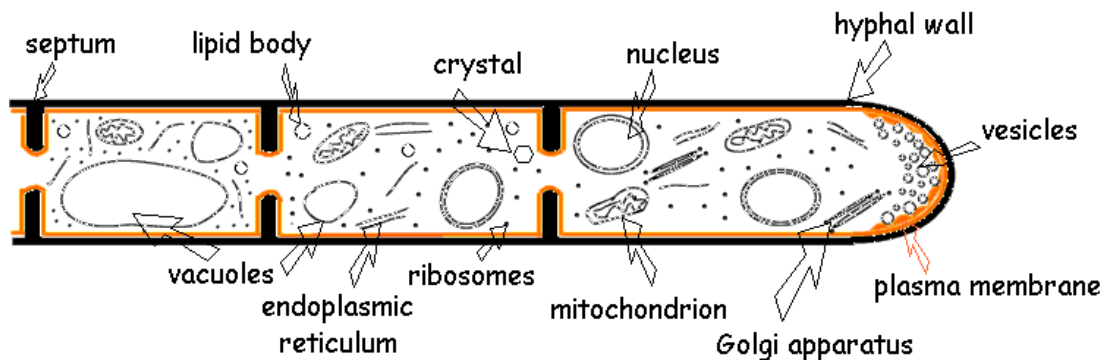


## GENERAL CHARACTERISTICS OF FUNGI AND FUNGAL-LIKE ORGANISMS CAUSING PLANT DISEASES

**Aim:** To acquaint the students with general characteristics of fungi and fungal-like organisms causing plant diseases

### Fungal Cell Structure

A typical fungal cell consists of protoplasm which is surrounded by a cell membrane, and cell wall being its outer most covering. The protoplasm typically contains nucleus, mitochondria, ribosomes, golgi bodies and endoplasmic reticulum among others.



### Typical fungus hyphal structure

#### Cell wall

- Made up of chitin and  $\beta$ -glucans in the members belonging to the kingdom **Fungi**.
- Chitin is a polymer of N-acetyl glucosamine units which is also found in the exoskeleton of insects.
- Made up of cellulose in kingdom **Straminopila** (including Oomycota).
- Cellulose is a polymer of  $\beta$  D-glucose units and is also found in the cell wall of plants and algae.

#### Nucleus

- The nuclei of fungi are extremely small and lie near the limit of resolution power of light microscope.
- Electron microscopic studies have revealed that the nuclear membrane does not disappear but constricts in the centre like a dumb-bell during

nuclear division. This type of division is known **karyochoresis**, term given by Moore in 1964.

- In **meiosis**, however, the nuclear membrane disappears.

### Life Cycle

- The fungi are mostly **haploid** organisms, i.e. their nuclei are haploid.
- The **thallus** multiplies by asexual methods.
- After sexual reproduction, a **diploid zygote** is formed.
- The zygote represents the diploid phase which is terminated by meiosis forming **haploid spores**.
- The spores on germination form the **haploid somatic** phase.
- In *Ascomycota* and *Basidiomycota*, **plasmogamy** is not immediately followed by **karyogamy**.
- The two nuclei of opposite strains remain as paired nuclei called dikaryon and give rise to dikaryotic hyphae.
- These are of limited duration in *Ascomycota*, as only a small portion of the mycelium, viz., the **ascogenous hyphae** become dikaryotic.
- In *Basidiomycota*, these extend through the major portion of the life cycle. The **monokaryotic mycelium** is of short duration and its function is only to establish dikaryotic mycelium as soon as possible.
- The dikaryotic phase, which is of **short duration** in *Ascomycota* is **extensive** in the life cycles of *Basidiomycota*.