## Cytoplasmic membrane

The prokaryotic cell has a cell membrane called the cytoplasmic membrane that froms the outer structure of the cell and separates the cell's internal structure from the environment. The cytoplasmic membrane is a membrane that provides a selective barrier between the environment and the cell's internal structures.

## The function of the Cytoplasmic Memebrane

The cytoplasmic membrane regulates the flow of molecules (such as nutrients) into the cell and removes waste from the cell by opening and closing passages called channels. In Photosynthesis prokaryotes, the cytoplasmic membrane functions in energy production by collecting energy in the form of light.
The cytoplasmic membrane is selectively permeable because it permits the transport some substances and inhibits the transport of other substances. Two types of transport mechanisms are used to move substances through the cytoplasmic membrane. These are passive transport and active transport.

## Cytosol and Cytoplasm

The cytosol is the intracellular fluid of a prokaryotic cell that contains proteins, liquids, enzymes, ions, waste and small molecules dissolved in water, commonly referred to as semifluid. Substances dissolved in cytosol are involved in cell metabolism. The cytosol also contains a region called the nucleoid, which is where the DNA of the cell is located. Unlike human cells, a prokaryotic microorganism has a single chromosome that isn't contained within a nuclear membrane or envelop. Cytosol is located in the cytoplasm of the cell. Cytoplasm also contains the cytoskeleton, ribosomes and inclusions.

## Ribosome

A ribosome is an organelle within the cell that synthesizes polypeptide. There are thousands of ribosomes in the cell. A ribosome is comprised of submits consisting of protein and ribosomal RNA, which is referred to as rRNA. Ribosomes and their submits are identified by their sedimentation rate. Sedimentation rate is the rate at which ribosomes are drawn to the bottom of a test tube when spun in a centrifuge. Sedimentation rate is expressed in Sydberg (s) units. The sedimentation rate reflects mass, size and shape of a ribosome and its submits.

## Inclusions

An inclusion is a storage area that serves as a reserve for lipids, nitrogen, phosphate, starch and sulphur within the cytoplasm. Scientists use inclusion to identify types of bacteria. Inclusions are usually classified as granules.

# MYCOLOGY

## Introduction

Mycology is the study of fungi. Fungi have several features that distinguish them from other organisms

1. They have a filametous branching of system of cells with apical growth, lateral branching and heterotrophic nutrition.
2. They are characterized by a life-cycle that begins with germination from spore or a resting structure, followed by a period of growth a the substrate is exploited to produce a biomass
3. Finally, there is a period of sporullation where propapules are formed that can be disseminated from the parent mycelium.

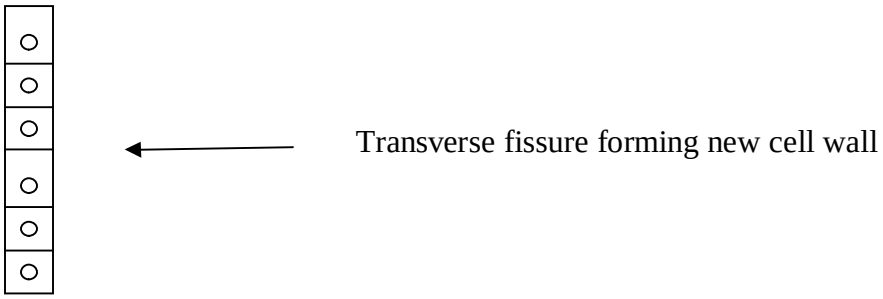
**Importance of Fungi**

1. They are vital to the biosphere for many reasons not the least, for their decomposing activities on dead substrate that ensure the release of nutrients like carbon, minerals and nitrogen back into the atmosphere(i.e. act as decomposers of complex organic materials in the environment)
2. They are major cause of plant diseases
3. They also cause many diseases of animals and man.
4. Fungi, especially the yeasts are essential to many industrial processes involving fermentation e.g. bread, wine and beer making.
5. They are important in the manufacture many antibiotics.
6. Fungi are important research tool in the study of fundamentals of biological process.

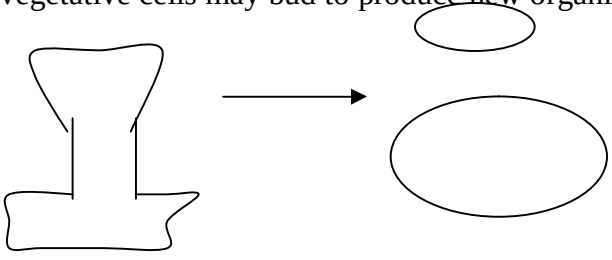
**Reproduction in Fungi**

Asexual reproduction: This can be accomplished in several ways

1. A parent cell can divide into two daughter cells by central constriction abd formation of new cell wall- (conidium)

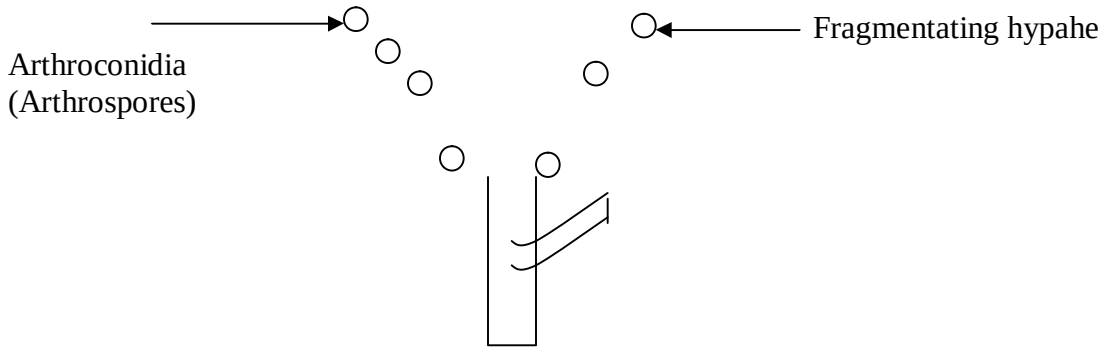



2. Somatic vegetative cells may bud to produce new organisms. This is common in yeasts.

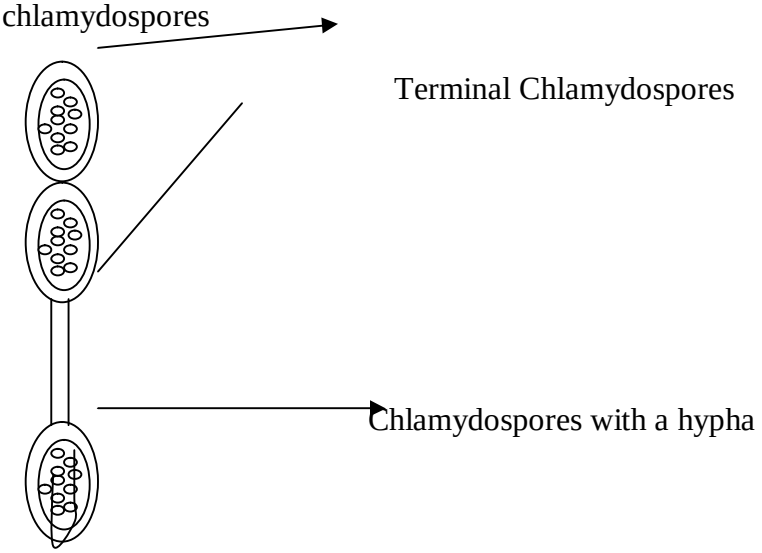


3. The most common method of asexual reproduction is spore production. Asexual spore formation occurs in an individual fungus through mitosis and subsequent cell division. There are several types of asexual spore.

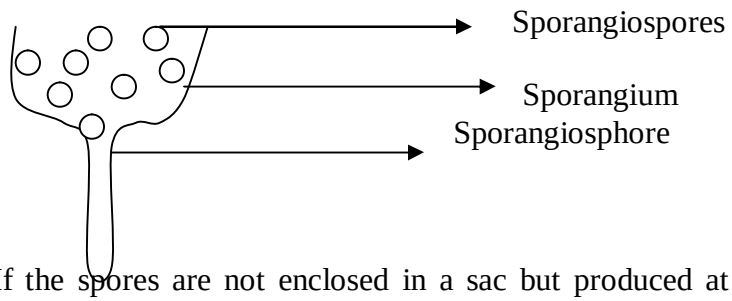
   a. Hypha can fragment to form cells that behave as spores. These cells are called arthroconidiao or athrospores.



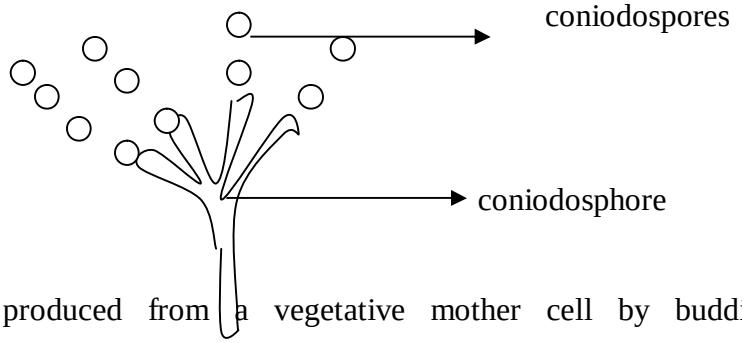

   b. If the cells are surrounded by a thick wall before separation, they are called chlamydospores



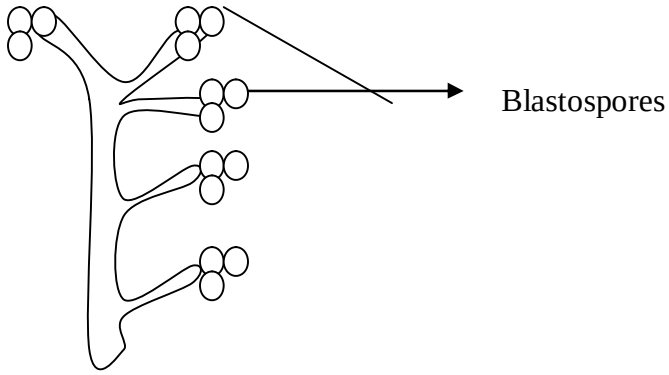
c. If the spores develop within a sac ( sporangium/ sporangia) at a hyphal tip, they are called sporangiospores




d. If the spores are not enclosed in a sac but produced at the tips or sides of the hypha, they are called comdiospores.




e. Spores produced from a vegetative mother cell by budding are called blastospores.




**Sexual Reproduction in Fungi**

Involves the union of compatible nuclei. Some fungal are self-fertilizing and produce asexually compatible gametes on the same mycelium- homothallic
Other species require out crossing between different but sexually compatible mycelia- heterothallic.

Sexual reproduction yields spores. For example in the zygomycetes the zygote develops a zygospore, in the ascomycetes, an ascospore, in the basiocomycetes a basidiospore.

Fungal spores are important for several reasons:

1. The size, shape colour and number are useful in the identification of fungal species.
2. For fungal dissemination

**Fungi metabolism**

Fungi prefer moist habitat and they are largely mesophyllic preferring temperature between 15 and $35^0$C. The carbon needs of fungi for energy metabolism and biosynthesis has to be met heterotrophically by one of three life styles.

a. Parasitism of plants and animals- causing diseases.
b. Saprophytism- growing on dead anima, plant or microbial biomass.
c. Symbiosis- growing together with algae, plants or insects.

**Structure**

The body or vegetative structure of fungus is called a thallus (thalli). It varies in complexity and size ranging from a single cell microscopic yeasts to multicellura molds, macroscopic puffballs and mushrooms. The fungal cell is enclosed in a cell wall of chitin.