

## **Fungal Cell Wall Composition**

Fungus belongs to a group of eukaryotic organisms that includes unicellular and multicellular fungi. They are categorized into Kingdom 'Fungi'. They form tangles of filaments. Yeast, on the other hand, is a unicellular organism that reproduces through binary fission or budding. Depending upon the environmental conditions, dimorphic fungi could shift between hyphal and yeast phase.

Fungi make use of organic compounds and carbon as a source rather than fixing carbon-dioxide from the atmosphere. It is not possible to fix nitrogen from the atmosphere, hence they have to obtain from the diet. They obtain nutrients from decaying organic matter for which they mainly depend upon plant materials. The nitrogen, carbon and other elements are released to the atmosphere when exoenzymes break down polysaccharides into insoluble readily absorbable glucose.

The cell wall of fungi is a dynamic structure that protects the cell from environmental stress and prevents from various effects that are caused due to changes in osmotic pressure. Biosynthesis is a unique feature of the fungal cell wall. They possess a complicated cellular structure. The cells of fungus comprise the membrane-bound nucleus and the DNA that is wrapped around histone proteins.

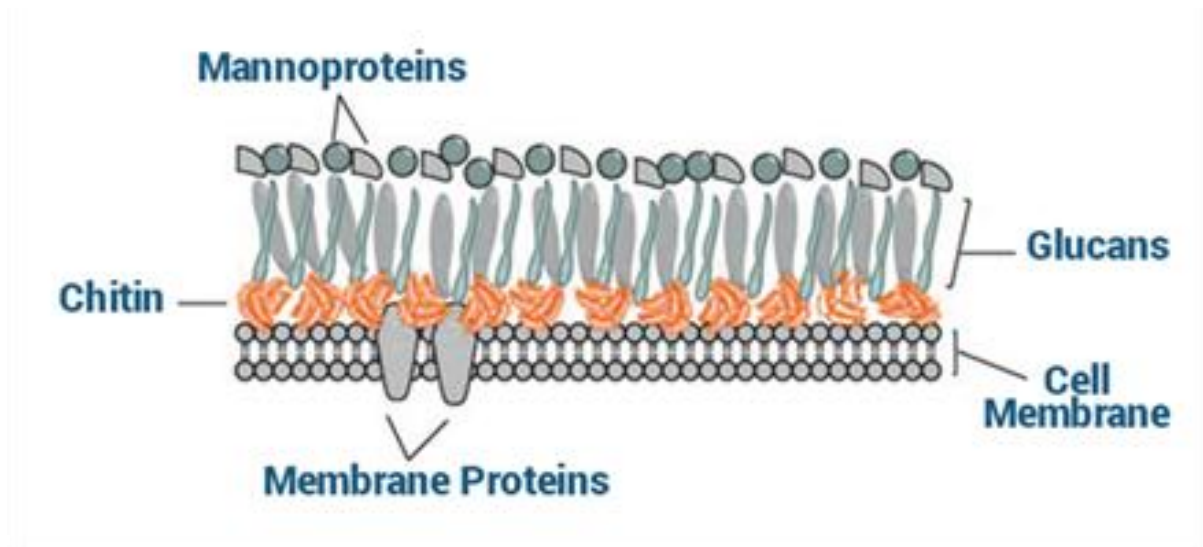
Fungal cell walls are made up of glucans, chitin, glycoproteins, and other components. The composition of the cell wall varies between species of fungi.

### **Components**

- **Glucans:** A major component of many fungal cell walls is  $\beta$ 1,3-glucan. Other glucans include  $\beta$ -1,6-glucan, mixed  $\beta$ -1,3-/ $\beta$ -1,4-glucan, and  $\alpha$ -1,3-glucan.
- **Chitin:** A component of the inner cell wall of most fungi.
- **Glycoproteins:** A component of fungal cell walls.
- **Mannoproteins:** A component of fungal cell walls.
- **Melanin:** A component of fungal cell walls.

## Structure

- The cell wall is layered, with the inner layer being more structural and the outer layers more heterogeneous.
- The inner layer is made up of a core of  $\beta$ -(1,3) glucan and chitin.
- The outer layer is made up of highly mannosylated cell wall proteins.



**Fig. Fungal Cell Wall**

## Functions

Provides cell rigidity and shape, Metabolism, Ion exchange, and Interactions with host defense mechanisms.