

Lecture 10

# Pathogenesis of fungi



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(Foundation Block, Microbiology)

## Lecture Objectives..

- To describe the general characteristics of fungi and recognize a fungus from all other living organisms
- To establish familiarity with the terminology needed by medical students
- To know certain fundamental facts about classification and identification of fungi

## Mycology:

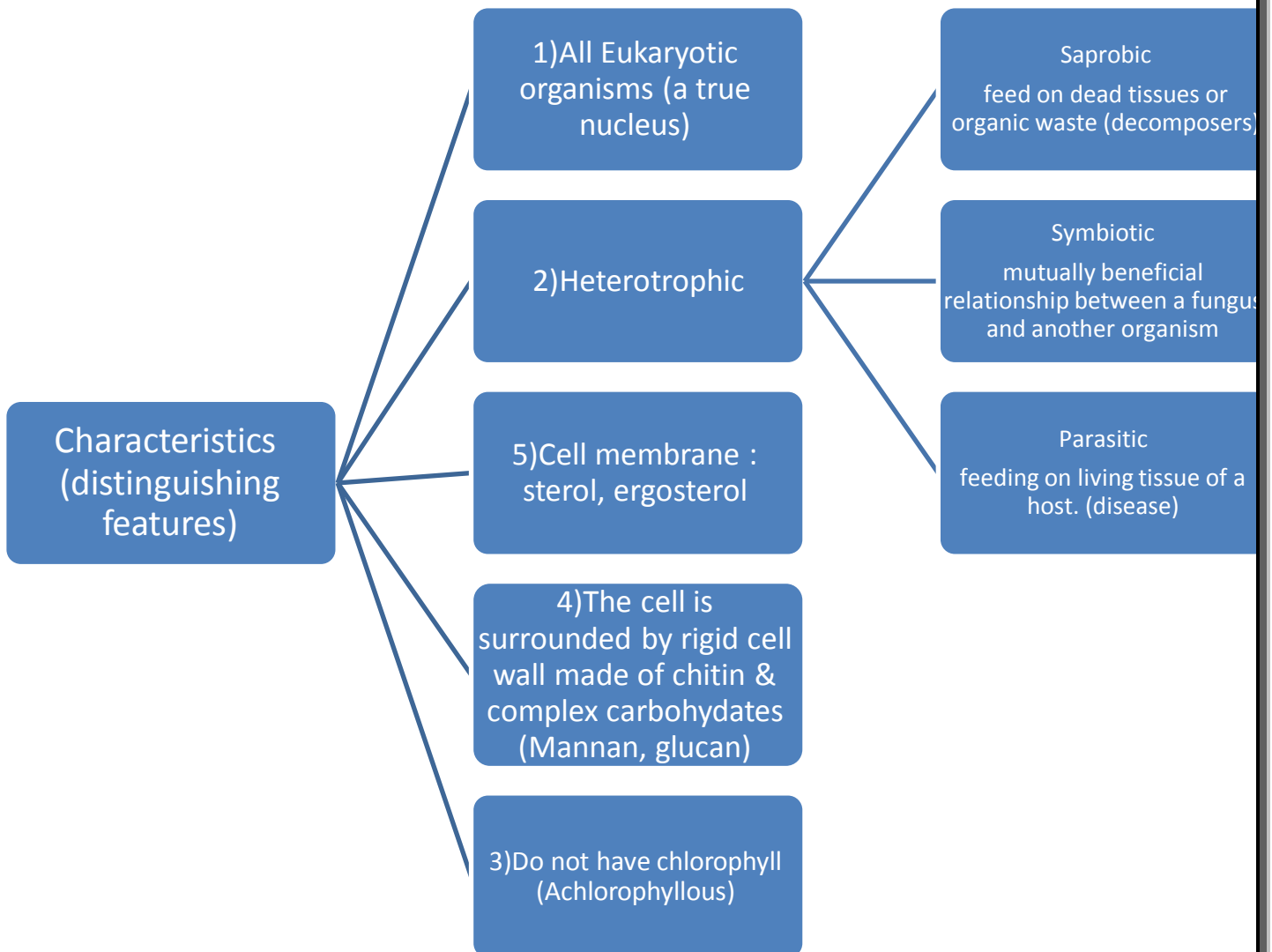
Study of fungi •  
Kingdom myceteae (= Kingdom fungi) •

## Medical mycology :

Study of medically important fungi •  
and the mycotic diseases.

## Mycoses:

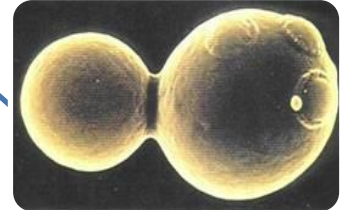
A disease caused by a fungus •



# MORPHOLGY

1. Yeasts :  
are unicellular organisms

e.g. *Candida albicans*,  
*Saccharomyces cerevisiae*



2. Filamentous fungi  
(Hyphae, mycelium)  
Hyphae are  
multicellular  
filamentous structures,  
constituted by tubular  
cells with cell walls.

–Septate (Cross-walls  
that divide hyphae into  
segments) : e.g.  
*Aspergillus*, *Penicillium*,

–Non-septate  
(Coenocytic) e.g.  
*Rhizopus*

3. Dimorphic  
Dimorphic: Have  
two forms  
depending on  
change in the  
environmental

• Yeast : Parasitic form,  
Tissue form, Cultured at  
37° C

• Mycelium: Saprophytic  
form, Cultured at 25 C

# Filamentous fungi (Mould=Mold)

A hypha (plural hyphae)

is a long, branching filamentous cell. hyphae are the main mode of vegetative growth.

Mycelium:

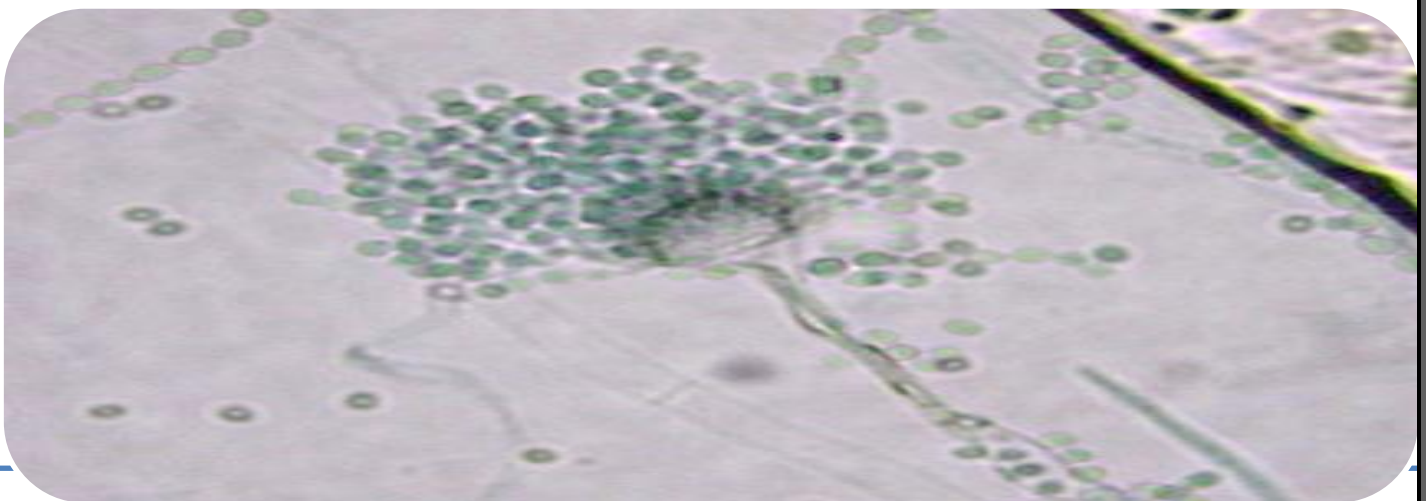
The intertwined mass of hyphae that forms the fungal colony.

Conidia (singular = conidium):

asexual spores borne externally on hyphae or on a conidiophore.

Conidia (singular = conidium): asexual spores borne externally on hyphae or on a conidiophore.

Conidiophore: the specialized hyphal stalk on which conidia develop either singly or in Clusters.



Septa:

Cross-walls (septa) that divide hyphae into segments. If there are no cross-walls, the hyphae are considered to be non-septate.

# Reproduction in Fungi

I) Asexual: Only mitotic cell division

1) Somatic Yeasts by budding  
Molds by hyphal fragmentation

2) Spore formation:  
a) Sporangiospores in sporangia  
b) Chlamydo spores in or on hyphae  
c) Conidia (conidium) on hypha or on conidiophores

Sexual: Fusion, mitosis, meiosis

Sexual spores:  
Oospore, Zygosporangium, Ascospore, Basidiospore

-They are produced by mitosis and readily disseminate in the air.

-These are the small airborne particles by which fungi reproduce



## General facts:

1. Fungi are all around us
2. Fungi play an important role in our ecosystem They decompose and recycle things on earth, decomposers of organic matter (clean the environment) Add nutrients to soil to help sustain plant life
3. Some fungi are used for producing antibiotics, and other medications.
4. We use fungi as source of food and also in cooking e.g. Mushrooms, Truffles *Saccharomyces cerevisiae*

fungi can cause diseases to humans Cause superficial infections some can cause allergic reactions Few cause invasive infections .

### **To cause the disease:**

1. Thermotolerance
2. Ability to survive in tissue environment
3. Ability to withstand host defenses