

# **Anatomycal structures of Fungi**

## **Week 4**

# 1) Cell Wall

Only hypha with septum have this structure. Since the septum-less (coenocytic) hypha are shaped as one cell or tubule, the wall of hyphae is accepted as cell wall

It determines the size and the shape of fungus. Protects the fungus from inappropriate environmental conditions, gives the antigenic property to the cell and because of the enzymatic content it exhibits physiological activity

The removal of cell wall reveals the protoplast form

The cell wall is multi laminal and fibrillary

This property improves the solidity of cell wall

The structure of cell wall includes:

% 80 polysaccharide (glucan, galactose, chitin, chitosane, mannan, cellulose)

% 5-15 protein

% 3-10 lipid

Cellulose and chitin give the fibrillary characteristic of cell wall



## 2) Septum

Except *Oomycetes* and *Zygomycetes* class the all other filamentous fungi do have septum

Simple septum: *Ascomycetes* and *Deuteromycetes*

Near the middle or in the middle of septum the pore is located

There are one or more Woronin particle that close this pore

Dolipore septum: *Basidiomycetes*

In the middle of the septumun there is a very narrow pore located and surrounded by amorph and puffy side (collar)

Around this structure there is a perforated (delikli), very thin membrane (parentosome) is located

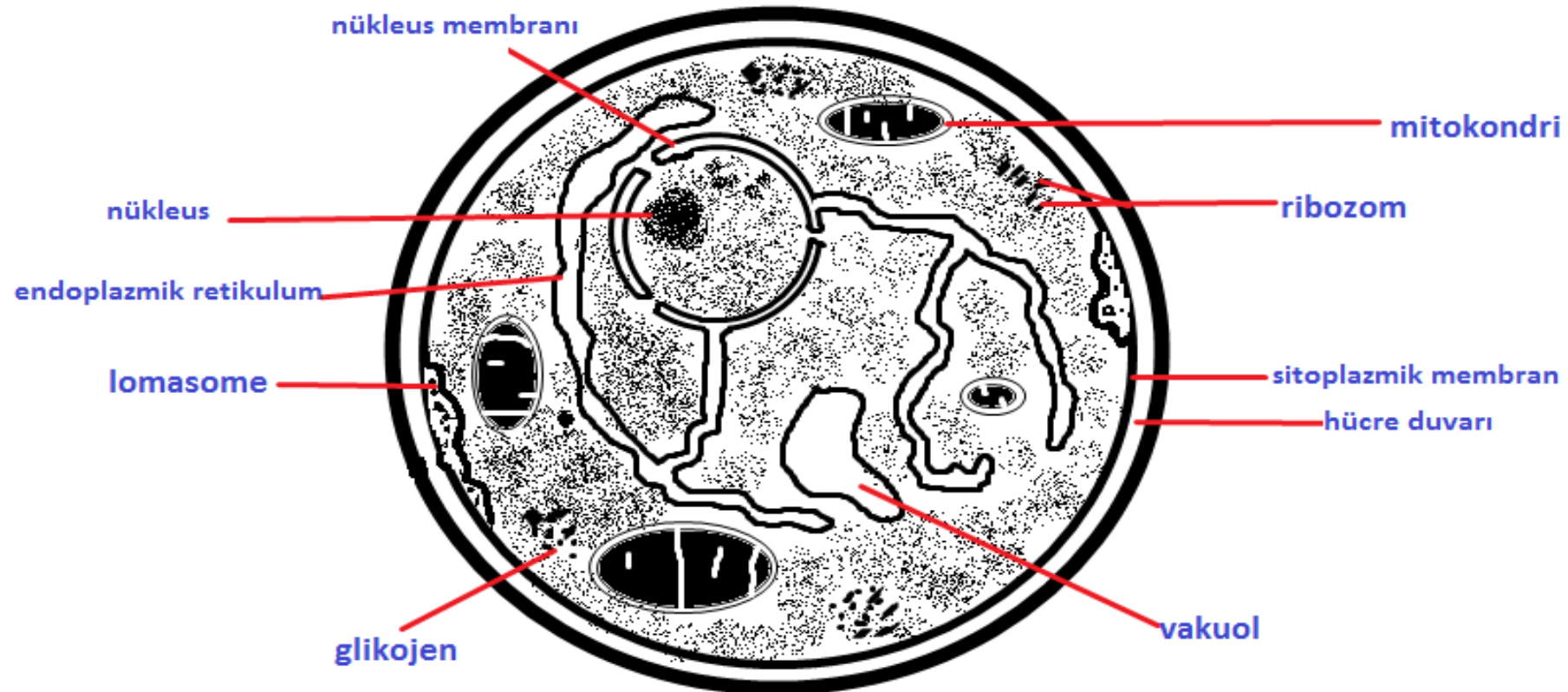
Dolipore septum permits the transmission of cytoplasm but not the cell nucleus

### 3) Cytoplasmic Membrane (plasmalemma)

Beneath the cell Wall there is a three layer unit membrane called plasmalemma

It is made of phospholipid, protein and sterol (ergosterol)

It has the permeability capability



#### **4) Lomasome**

This is an organelle between the cell wall and cytoplasmic membrane

The cytoplasmic membrane is collapsed

It has the ability of secretional activity and cytoplasma synthesis

## **5) Endoplasmic reticulum**

It is surrounded by 2 layer unit membrane and there are rybosomes on it

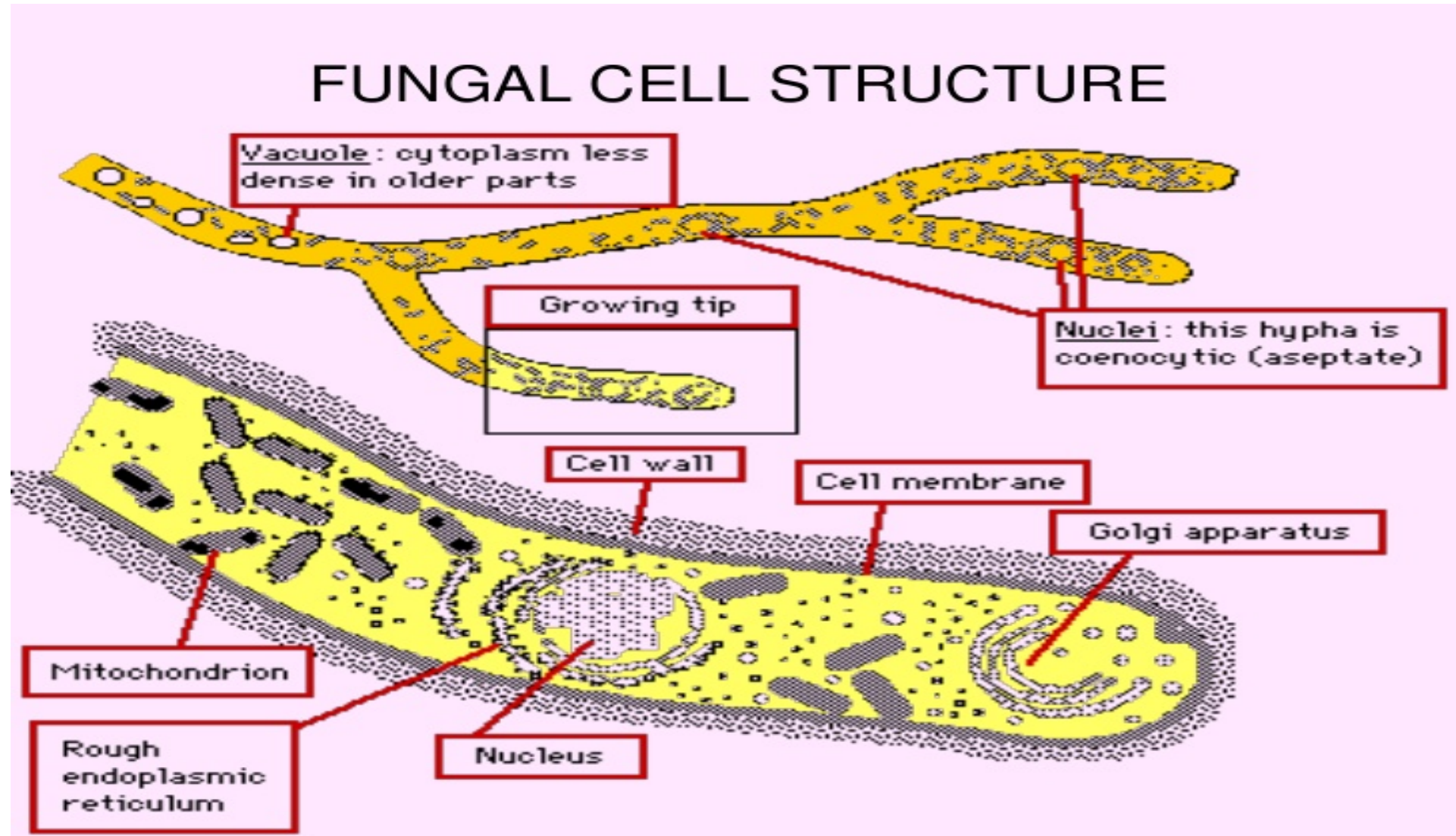
Lipoprotein structure

It has a function in protein synthesis and the transport of necessary substances for the metabolism

## 6) Vacuole

They are surrounded by unit membrane

It contains pigment, crystal and amorph substances





## **7) Vesicle**

There are many in the growing hyphae

Originated from the Golgi apparatus

It has a role in cell wall synthesis and lysis

## **8) Nucleus and nucleolus**

All cells have one, very young and rapidly growing hyphae have more than one

In septum-less hyphae all cells have more than one

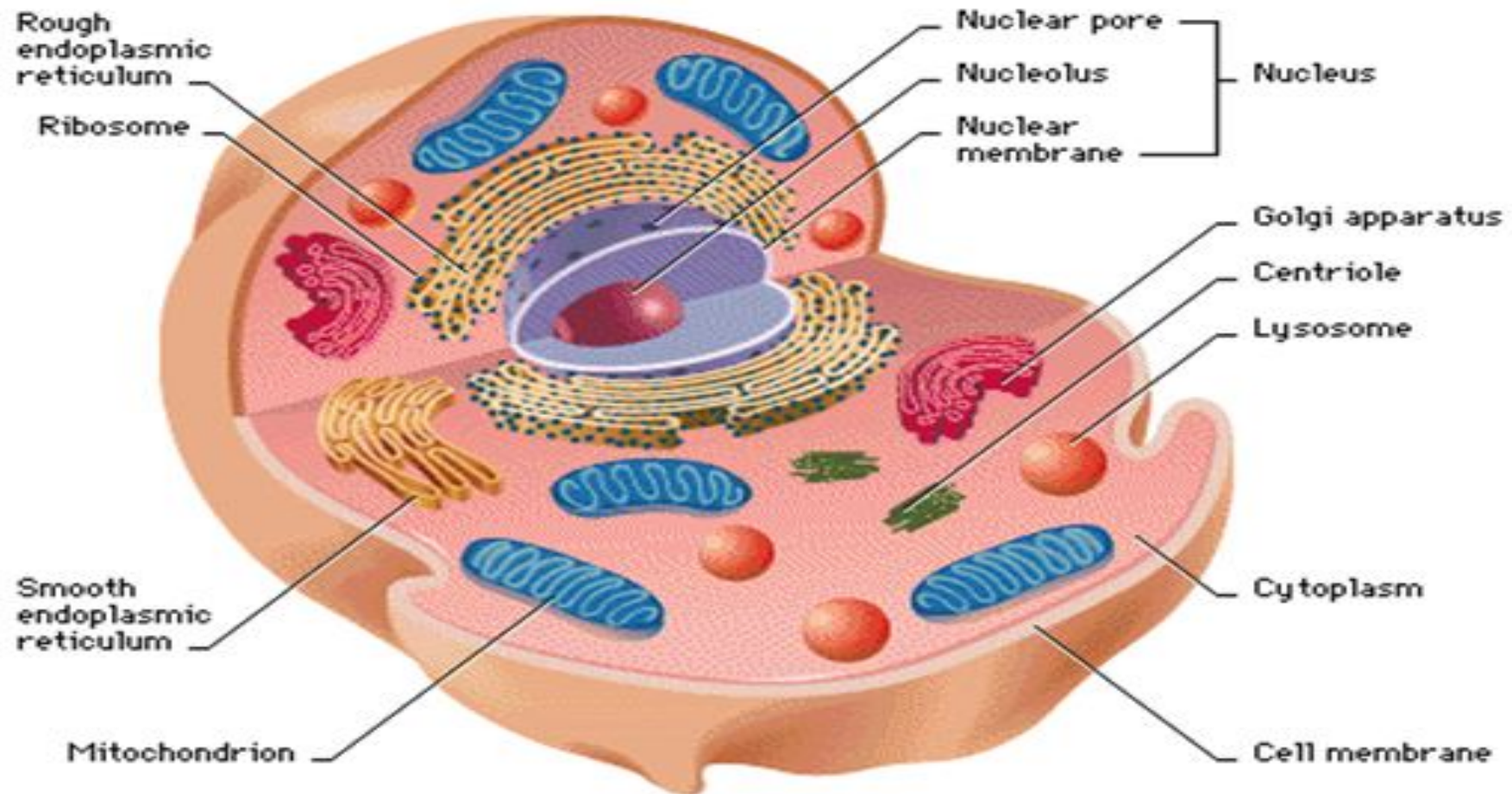
Chromosome is made of DNA

A perforated membrane is located around it

## 9) Mithochondrion

Its structure is made of protein and DNA

It is the energy source central of the cell



## **10) Ribosome**

Protein synthesis

% 50-70 RNA and % 35-50 protein structure

80 S (60S + 40S) (S : Svedberg unit)

## **11) Golgi apparatus**

**Cytoplasmic granules**

**Lysosome**

**Chitosome**

# **Anatomycal Structures of Yeasts**

They are spherical, round or cylindrical shaped and unicellular organisms  
Sometimes they come together and form long chains (pseudohyphae)

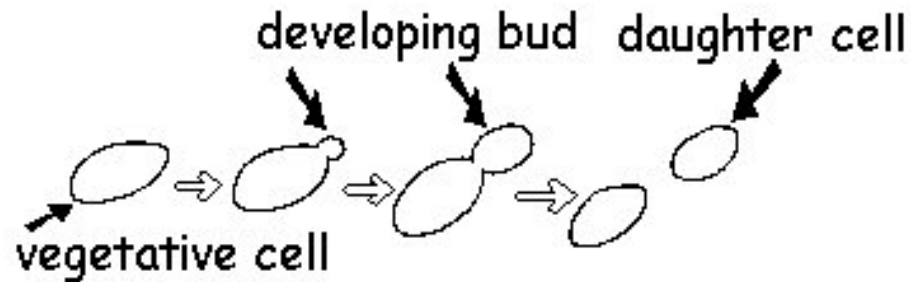
### 1) Cell Wall

Mostly glucose and mannose polymers, less lipid, protein and chitin includes

### 2) Cytoplasmic Membrane

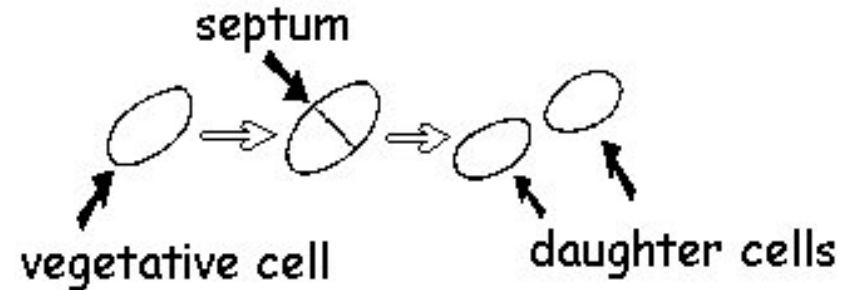
Unit membrane structure and permeability capability

### 3) Nucleus, granules, vacuole, mitochondrion and ribosome



Asexual reproduction of yeast by budding

Ex. *Saccharomyces cerevisiae*



Asexual reproduction of yeasts by dividing

Ex. *Schizosaccharomyces pombe*

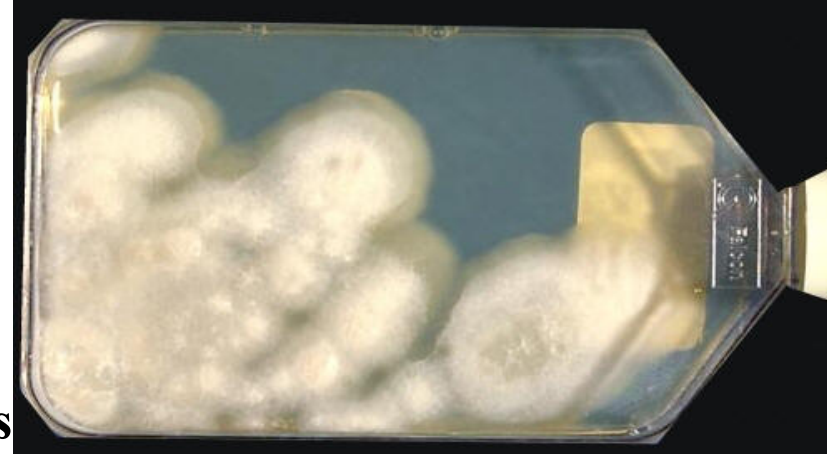
# Macroscopic Morphology of Fungi

## Diphasic fungi

(*Coccidioides immitis*)

✓ 37 °C yeast like

✓ 22-25 °C mycelial colony



## 1) Mycelial colonies

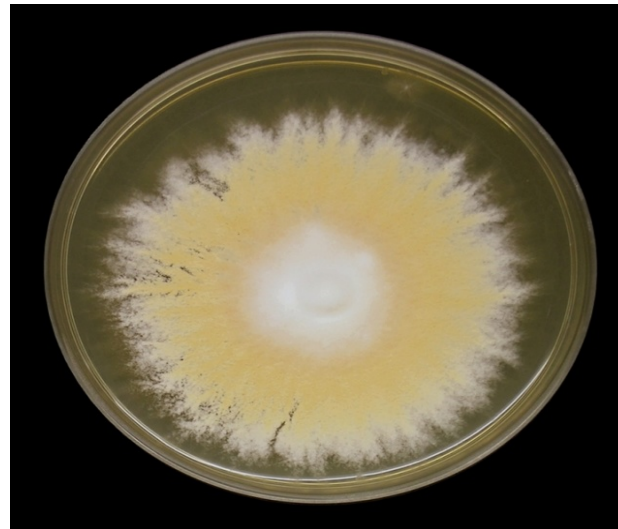
✓ **Dermatophytes leads to cutaneous**

(*Epidermophyton*, *Microsporum*, *Trichophyton*)

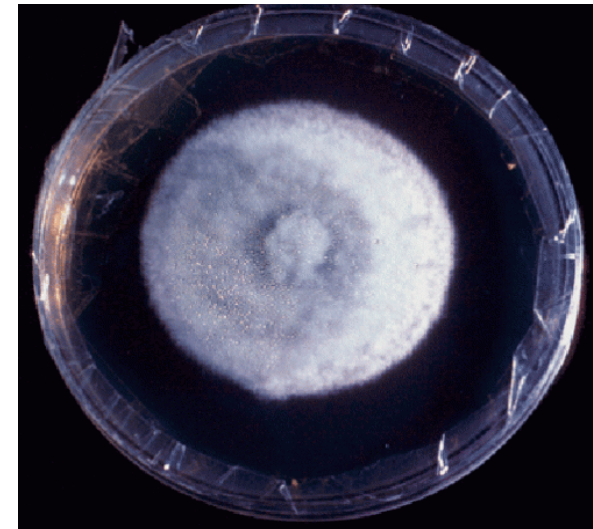
✓ **Systemic mycoses** (*C. immitis*)



*Epidermophyton*



*Microsporum*



*C. immitis*

## 2) Yeast-like colonies

( *Saccharomyces cerevisiae* )

✓ Soft, mucoid,

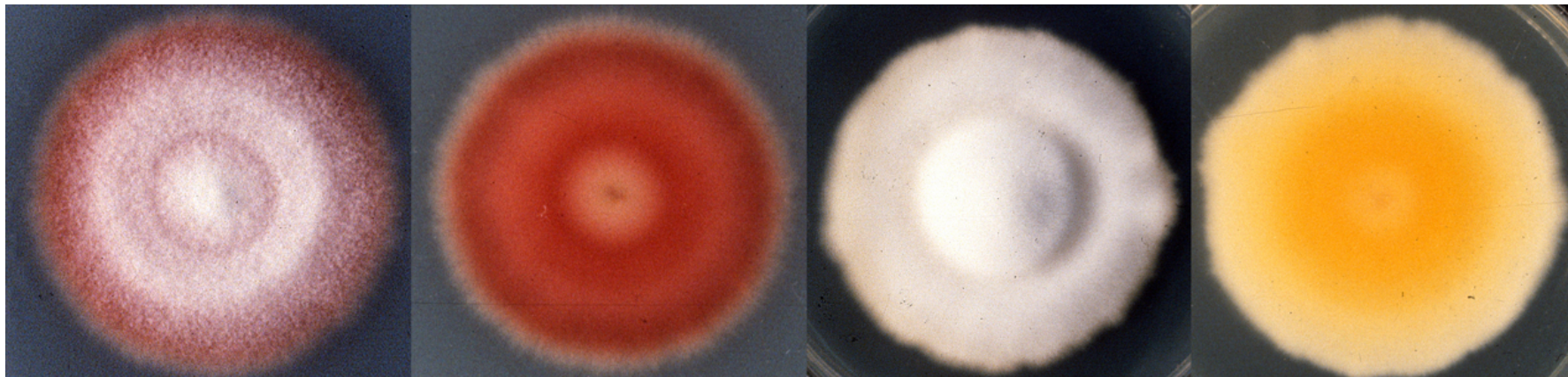
✓ Fluffy and moist shaped colonies



## 3) Membranous colonies

Thin skin-like or membranous colonies

✓ ( *Trichophyton* spp. )





#### 4) Granular colonies

- ✓ If there is so much sporulation occurs in colony, aerial hyphae decreases in number and colony will exhibit granulation

#### 5) Pleomorphic colonies

- ✓ As a result of long-time passages, the development of in the middle or around the colony, white, sterile and velvet (kadife) like hyphae