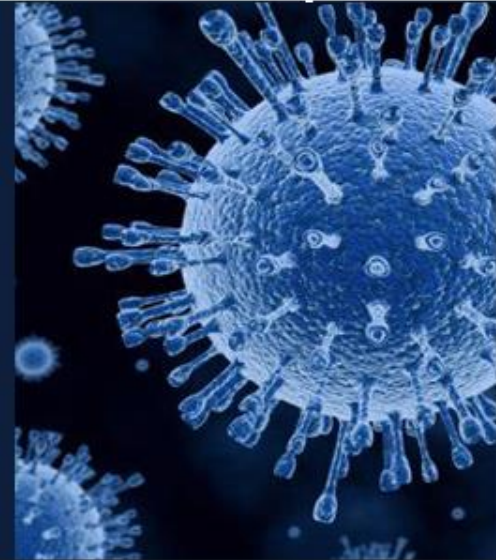
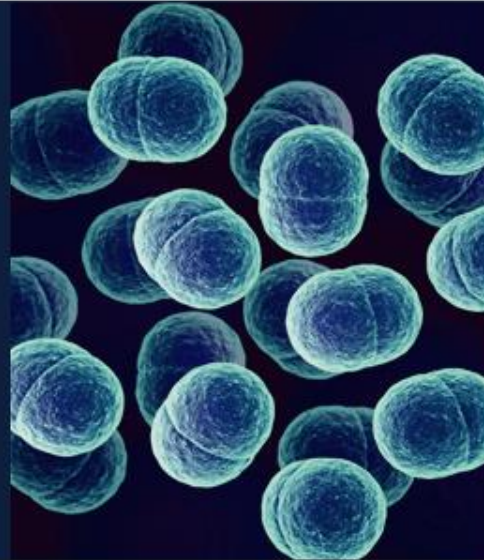


# MICRObiology

TEAM 435

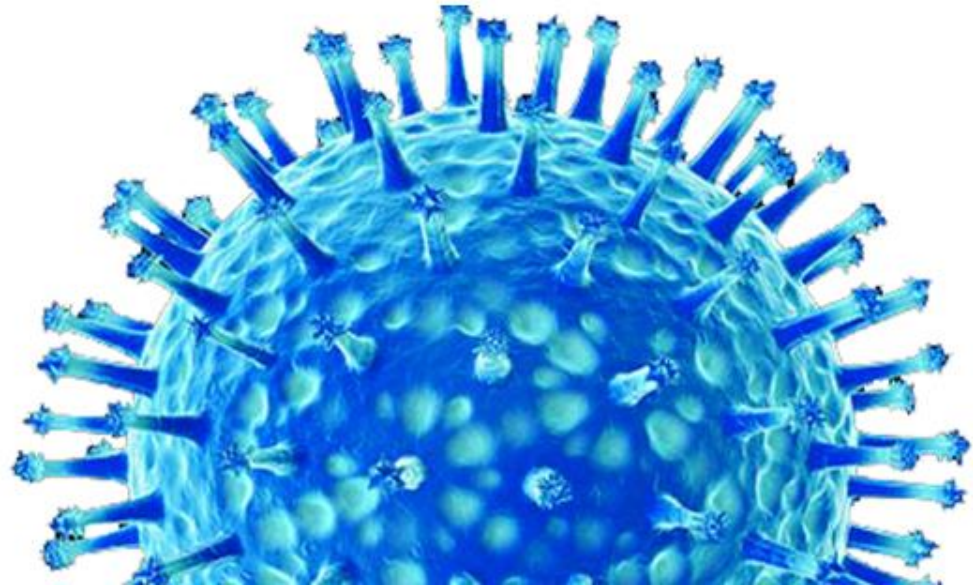
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## Lecture 10 Fungi

# 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 reproduction and identification of fungi.





# General Characteristics Of Fungi

**Mycology:** Study of fungi, (Kingdom Myceteae = kingdom Fungi)

**Medical mycology:** Study of medically important fungi and their diseases

**Mycoses:** A disease caused by a fungus

Myco = Fungus in Greek

## Characteristics of fungi:

All Eukaryotic  
(a true nucleus)

Heterotrophic:

Do not have chlorophyll  
(Achlorophyllous)

Cell membrane  
(Sterol, Ergosterol)

The cell is surrounded by a  
rigid cell wall made of:

Saprobic: feed on dead  
tissues or organic waste  
(decomposers)

Symbiotic: mutually beneficial  
relationship between a fungus  
and another organism

Parasitic: feeding on living  
tissue of a host  
(disease)

Chitin

Complex carbohydrates  
(Mannan, Glucan)

**Extra:**  
Mannan  
and Glucan  
are targets  
for the  
diagnosis of  
fungal  
infections.

## Types of morphology:

Yeasts:  
unicellular  
organisms

Filamentous  
"Mold" fungi:  
(Hyphae,  
mycelium)

Dimorphic

**Extra:**  
Grow as  
round oval  
structures.

Hyphae are  
multicellular  
filamentous  
structures,  
constituted by  
tubular cells with  
cell walls.

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

Filamentous:  
Saprophytic form,  
Cultured at 25 C

**Extra:**  
Grow as a  
filament  
"Hyphae"

Dimorphic: Have two forms depending on change in the environmental factors (Ex: Temperature)

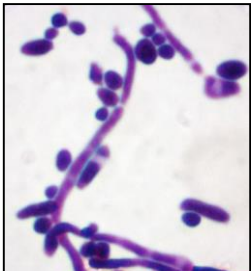
Mold  
form

Yeast form



# Yeasts

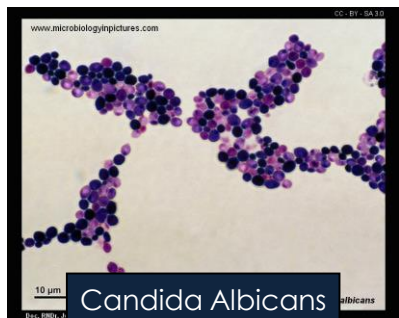
Morphology:	Reproduction:	Examples:	Clinical Examples:
Colony	Budding (Asexually)	Candida Albicans (found as normal flora)	Pseudohyphae Extra: Pseudo = not true hyphae but it still a yeast
		Saccharomyces cerevisiae (found in Baking Powder)	



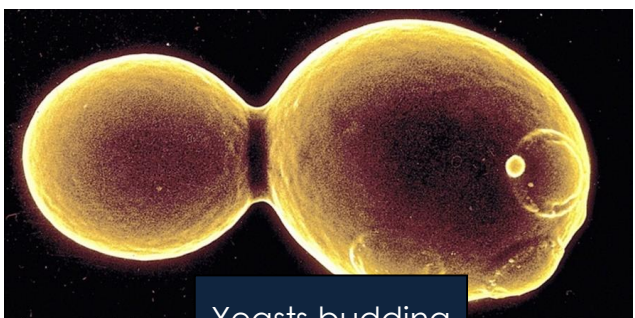
Pseudohyphae



Saccharomyces cerevisiae



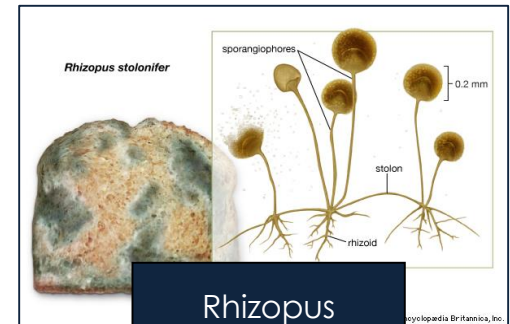
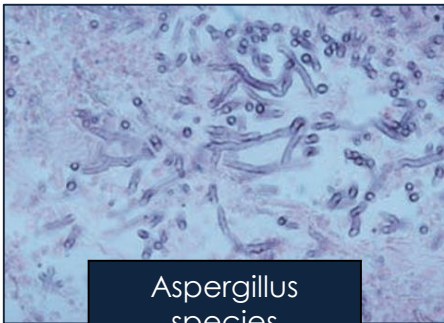
Candida Albicans stained



Yeasts budding

# Filamentous (Mold) fungi

A hypha: (plural hyphae)	Mycelium: (colony)	Conidia/Spore:	Examples:
<p>is a long, branching filamentous cell. hyphae are the main mode of vegetative growth.</p>	<p>The intertwined mass of hyphae that forms the fungal colony.</p>	<p>asexual spores born externally on hyphae or on a conidiophore.</p>	<p><b>Aspergillus</b> (Extra: very common pathogenic filamentous fungi)</p>
			<p><b>Penicillium</b> (Extra: synthesize penicillin)</p>
			<p><b>Rhizopus</b> (Extra: causes Black bread mold)</p>



## Selected Features of Fungi and bacteria compared

### Selected Features of Fungi and bacteria compared

	Fungi	Bacteria
Cell Type	Eukaryotic	Prokaryotic
Cell Membrane	Sterols present	Sterols absent, except in Mycoplasma
Cell Wall	Glucans, mannans, chitin (no peptidoglycan)	Peptidoglycan
Spores	Sexual and asexual reproductive spores	Endospores (not for reproduction), some asexual reproductive spores
Metabolism	Limited to hetrotrophic, aerobic, facultatively anaerobic	Hetrotrophic, autotrophic, aerobic, facultatively anaerobic, anaerobic

# Filamentous (mold) fungi

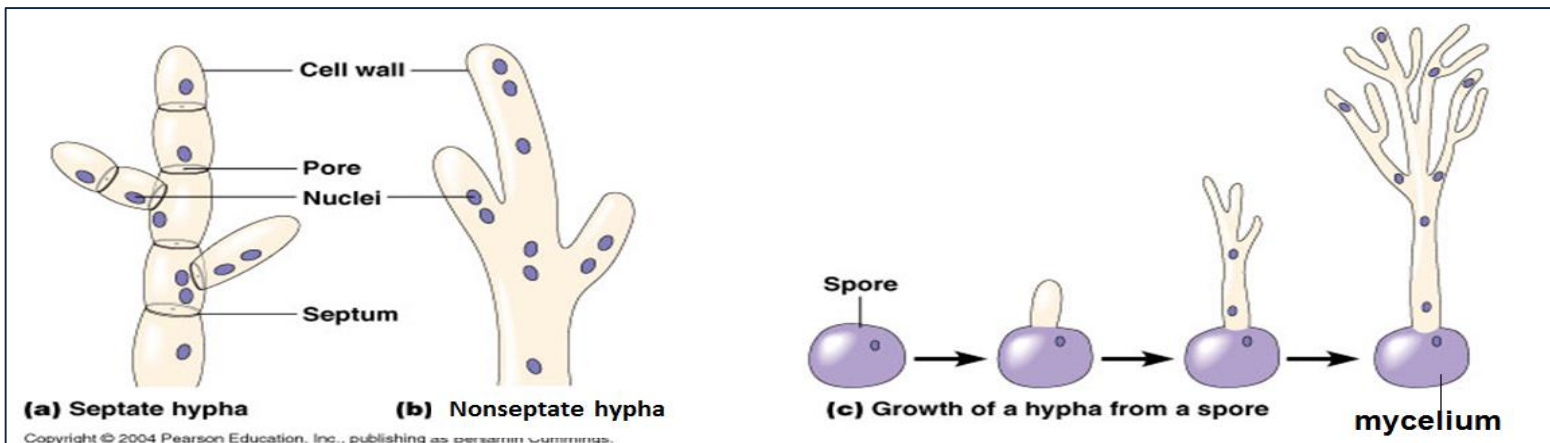
The threads (hyphae) are actually tubular cells that, in some fungi, are partitioned into segments (septate); whereas, in other fungi, the hyphae are uninterrupted by cross walls (nonseptate).

◆-----◆

Mycelium is the intertwined mass of hyphae that forms the fungal colony, and conidia is spore produced asexually by various fungi at the tip of a specialized hypha.

**Examples:** penicillium, aspergillus and rhizopus

It's a type of fungi that grows by branching and tip elongation





# MORPHOLGY

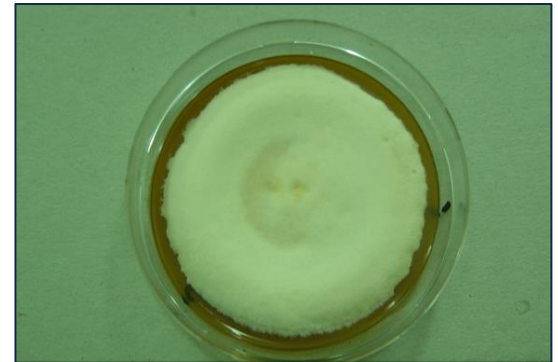
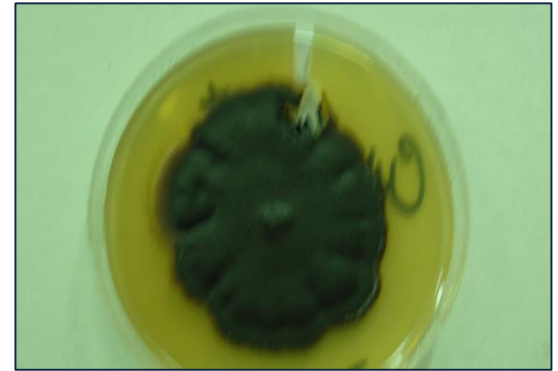
Moniliaceous  
molds:

hyaline or lightly  
pigmented  
conidia or  
hyphae, colorless

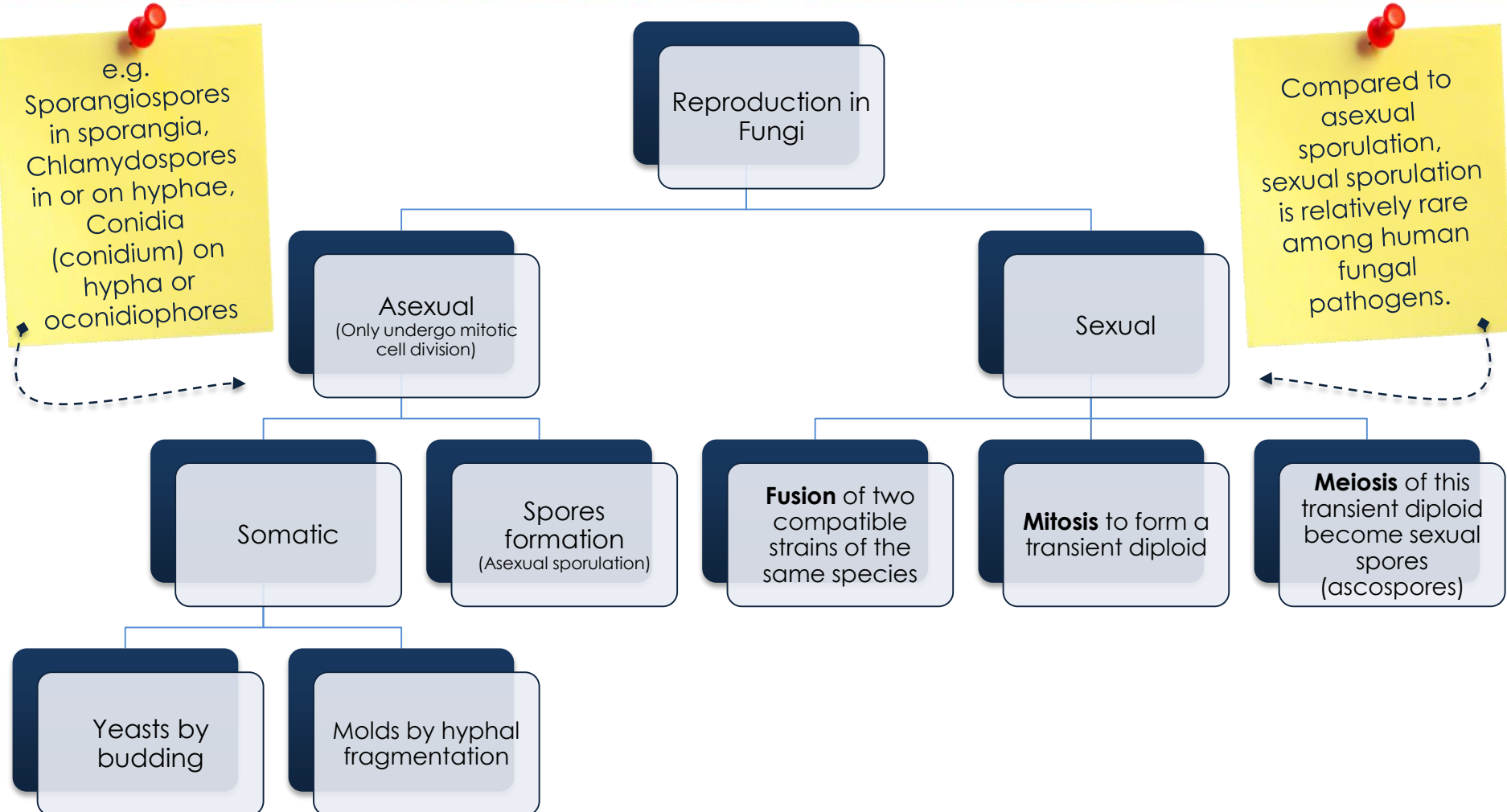
e.g. *Aspergillus*,  
*Penicillium*

Dematiaceous  
Molds:

Are pigmented.  
Because of the  
pigment, the  
colonies appear  
dark, brown, or  
black



# Reproduction in Fungi



# PATHOGENICITY OF FUNGI

## ❖ **Spores:**

These are the small airborne particles by which fungi reproduce, they are produced and disseminate in the air.

---

## ❖ **Fungi can cause diseases to humans**

Cause superficial infections

some can cause allergic reactions

Few cause invasive infections

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## ❖ **Not all fungi are pathogenic, to cause the disease:**

Thermotolerance

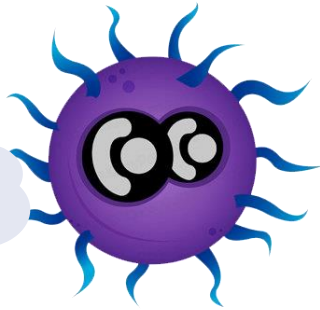
Ability to survive in tissue environment

Ability to withstand host defenses



## Online Quiz

Fine!  
Just click  
[HERE](#)



## Videos

- [-What is a fungus?](#)
- [- Overview of the Fungal Cell Structure.](#)
- [- Crash Course Biology.](#)



## Books that could help you

- ❖ Lippincott's Illustrated Reviews : Microbiology Second Edition.
- ❖ Lippincott's Microcards Microbiology Flash Cards Third Edition.



# MICRObiology

TEAM 435

## Boys Team

- **Ali Alzahrani**
- Khalid Sharahily
- Ahmad Alzahrani
- Zeyad Alsalem
- Muhammad Dossary
- Meshal Alhazmy
- Hamzah Alfiar

## Girls Team

- **Lamya Alsaghan**
- Nojood Alhaidri
- Monera Alayuni
- Alanoud AlOmair
- Shahad Alenezi
- Aisha Al-Sabbagh
- Bodour Julaidan
- Noura AlTawil
- Deema AlFaris
- Sara Al-Hussein
- Suha Alenezy
- Latifah Alsukait
- Dalal Alhuzaimi
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