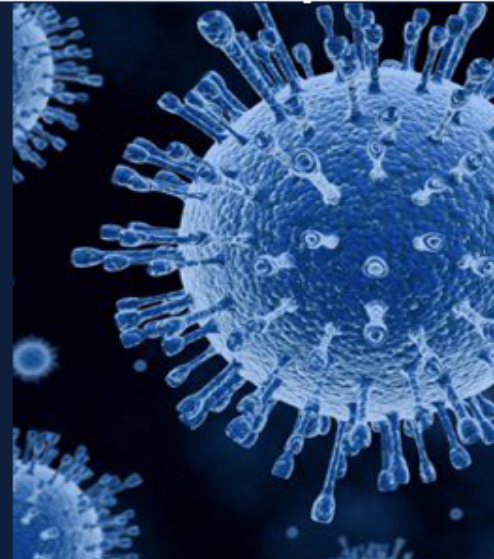
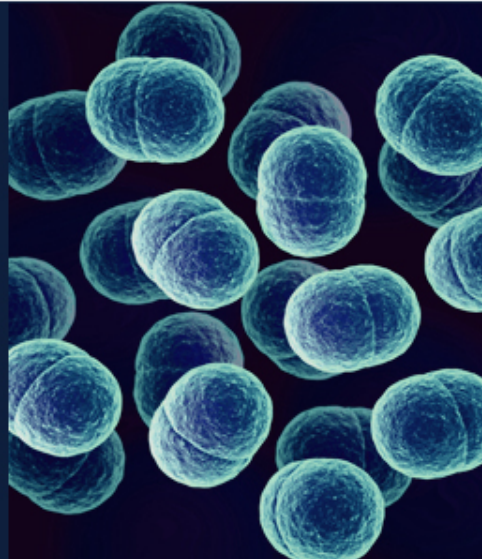


MICRObiology

TEAM 435

هذا العمل لا يغني عن المرجع الأساسي للمذاكرة



Lecture 11

Diversity of Fungi and Fungal Infections

● Important

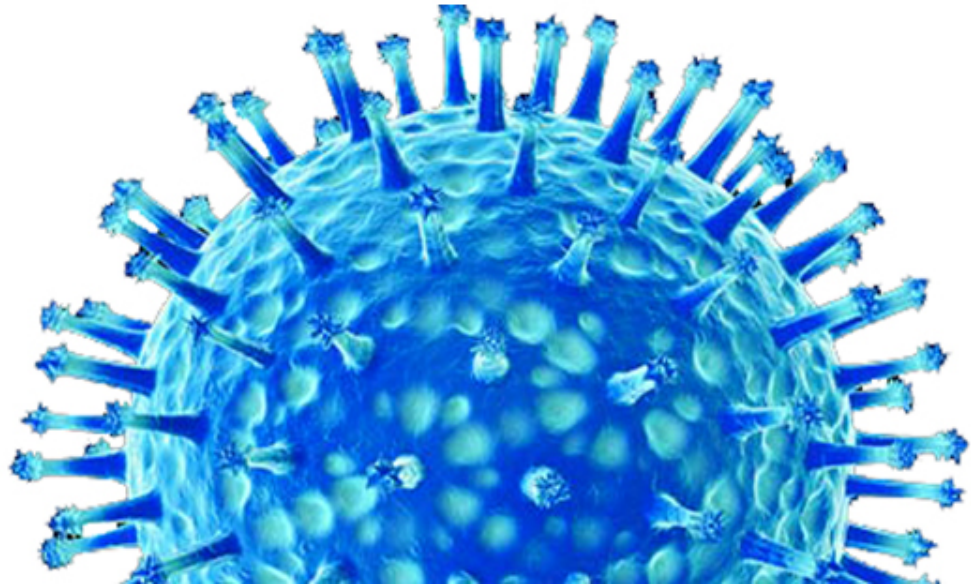
● Term

● Extra explanation

● Additional notes

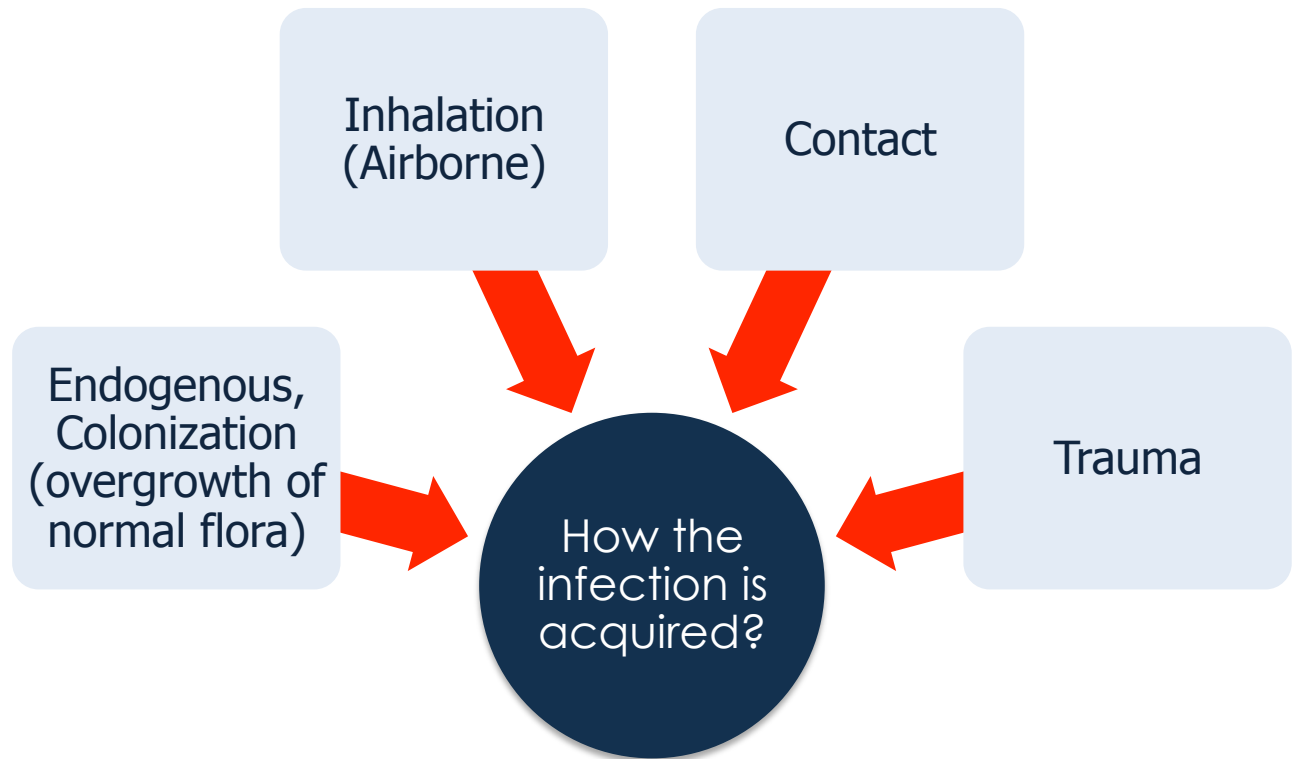
Objectives

- To provide students with an **overview** of the common medically important yeasts and mold fungi.
- To provide students with an **overview** of the major fungal diseases that threatens human health.
- To give a fundamental knowledge about the **antifungal agents**, their **mechanisms of action**, and **spectrum**.





Mycotic Diseases:





Types of Fungal infections (Mycoses)

Superficial Mycoses

Affect the outer layer of the skin or hair shaft

No immune response

Cutaneous Mycoses

Dermatophytosis

Infection of the skin, hair or nails caused by a group of keratinophilic fungi, called dermatophytes

Subcutaneous Mycoses

Fungal infections involving the dermis, subcutaneous tissues, muscle and may extend to bone.

Usually they are initiated by trauma.

Systemic Mycoses

Caused by primary pathogens

Contracted by inhalation, Start as respiratory disease

Geographically restricted (endemic), north and south America

Opportunistic Mycoses

Diseases in immunocompromised host

Risk factors

- Examples:
HIV/AIDS
Hematopoietic stem cell transplant (HSCT)
Solid organs transplantation

Malignancies ,Neutropenia
Diabetes and Many others

The Fungi

A- Opportunistic Fungi

Normal Flora

- Candida spp.
- Other yeast

*Ubiquitous in our environment

- Aspergillus spp.
- Zygomycetes spp.

*Other Fungi

B- Primary Pathogens

Endemic geographically restricted

Dermatophytes

- Histoplasma spp.
- Blastomyces spp.
- Coccidioides spp.
- Paracoccidioides spp.

Diagnosis of Fungal Infection

Clinical features (clinical presentation)

Imaging

Lab Investigations

History, risk factors, etc.

Good value in diagnosis and therapy monitoring

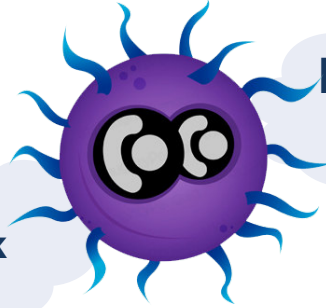
-Histopathology
-Microbiology

Target for Antifungal Agents

Target	Group	Mechanism of action	Antifungal Agents	Spectrum of activity	Comments
Cell membrane	Polyenes	Binds to ergosterol within the fungal cell membrane resulting in formation of pores which permit leakage of intracellular contents, and lead to cell death	*Amphotericin B, lipid formulations *Nystatin	Amphotericin B has Broad antifungal spectrum which includes most fungi that cause human disease	Serious toxic side effects (nephrotoxicity)
	Azoles	Inhibit the synthesis of ergosterol the major sterol of fungal cell membrane.	Ketoconazole Itraconazole Fluconazole Voriconazole Posaconazole Miconazole clotrimazole	Fluconazole has a limited or no activity against mould fungi Voriconazol is the drug of choice for Aspergillois Posaconazole has broader spectrum of activity than other azoles	Not effective against zygomycosis (except posaconazole) Adverse Effects Drug Interactions
Cell wall	Echinocandins	*Inhibits B-1,3 –D glucan synthase, (the enzyme complex that forms glucan polymers in the fungal cell wall) *Glucan polymers are responsible or providing rigidity to the cell wall.	Caspofungin Micafungin Anidulafungin	Good activity against Candida spp , Aspergillus spp Limited or no activity against other fungi	Less toxicity and side effects compared to amphotericin B and azoles
DNA/RNA synthesis	Pyrimidine analogues	*Fungal RNA miscoding *Interfering with DNA synthesis	Flucytosine	Restricted spectrum of activity Active against: Candida species Cryptococcus neoformans	Monotherapy now limited (Resistance)



Online Quiz



Pull my
pili!

Fine!
Just click
[HERE](#)



Videos

Part 1

<https://youtu.be/FIHg-PA97gE>

Part 2

http://youtu.be/DBB_vcFuoS4



Books that could help you

Lippincott's Illustrated Reviews



MICRObiology

TEAM 435

We do things better

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- Muhammad Dossary
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Girls power!

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