Medical mycology

- Overview
- Pathogenic Fungi
- Opportunistic fungi
- Cutaneous
- Intoxication

Tinea pedis : Athlete;s foot

Epidemology

- 100,000 spp of fungi
- <200 cause disease in humans
- Most not contagious,
- Except dermatophnytes
- Spores
- Hard to treat, eukaryotic cells
- Not reported so do not know the extent in the human population

Clinical manifestations

- Fungal infections– most common
- Toxicoses– poisoning through ingestion
- Allergies– hypersensitivity reactions
- Diagnostic– sabouraud dextrose agar
  KOH

Treatment

- Membrane has ergosterol not cholesterol
- Target synthesis
- Amphotericin B– treat systemic mycoses, very toxic to humans
- Azoles – less toxic, fungistatic
- 5-Fluorocytosine inhibits RNA and DNA synthesis

Fungal pathogens

- Actively attack and invade tissue
- Dimorphic forms

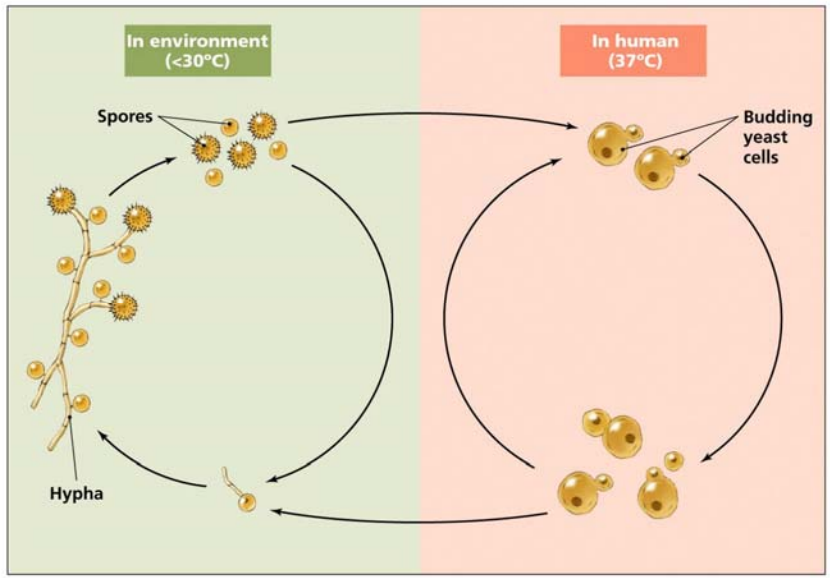


Figure 22.2 - Overview

Distribution of fungal pathogens

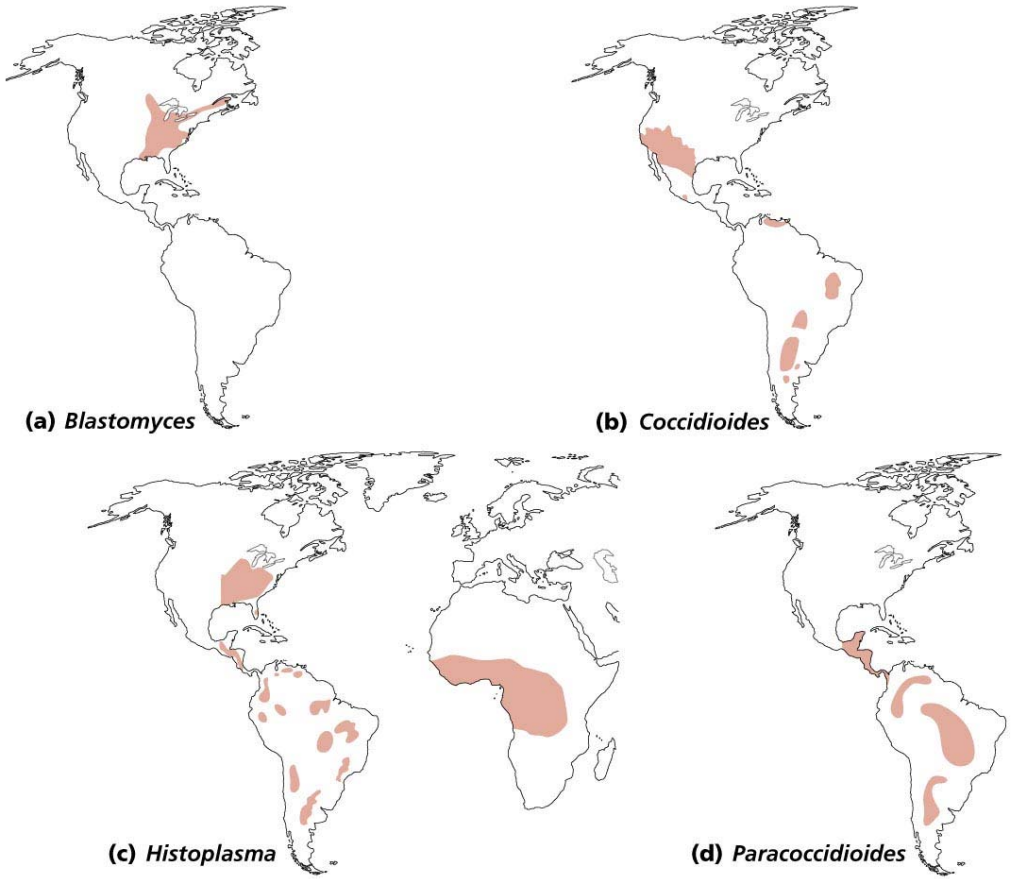


Table 22.1 Factors That Predispose Individuals to Opportunistic Mycoses

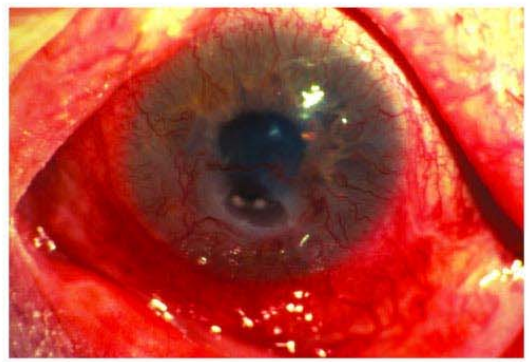
Factors	Examples
Medical procedures	Surgery; insertion of medical implants (heart valves, artificial joints); catheterization
Medical therapies	Immunosuppressive therapies accompanying transplantation; radiation and other cancer therapies; steroid treatments; long-term use of antibacterial agents
Preexisting conditions	Inherited immune defects; leukemia and lymphomas; AIDS; diabetes and other metabolic disorders; severe burns; preexisting chronic illnesses
Lifestyle factors	Poor diet; poor hygiene; IV drug abuse

Candidiasis--opportunistic

(a)

(b)

(c)



(d)

Figure 22.10 - Overview

Table 22.2 The Clinical Manifestations of Candidiasis *(continued)*

Type	Clinical Signs and Symptoms	Predisposing Factors
Peritoneal	Fever, pain, tenderness	Indwelling catheters for dialysis or gastrointestinal perforation
Urinary tract	Urinary tract infection: painful urination, possible discharge Renal: fever, pain, rigors, fungus ball	Chemotherapeutic drug regimens, catheterization, diabetes, preexisting bladder problems
Meningeal	Swelling of the meninges, fever, headache, stiffness of the neck	Dissemination of *Candida* during systemic infection
Hepatic and splenic	Fever, swelling of the liver and spleen, liver dysfunction, lesions and abscesses	Leukemia
Endocardial, myocardial, pericardial	Fever, heart murmur, congestive heart failure, anemia	Preexisting heart valve disease, catheterization plus use of antibiotics, IV drug abuse, valve prosthetics
Ocular	Cloudy vision, lesions within the eye	Disseminated candidiasis, indwelling catheters, IV drug abuse, trauma
Osteoarticular	Pain when weight is placed on joint	Disseminated candidiasis, prosthetic implants
Candidemic	Antibiotic-resistant fevers, tachycardia, hypotension, skin lesions, small abscesses in various organ systems	IV or urinary catheters, use of antibacterial drugs, surgery, severe burns, antibacterial therapy

Table 22.3 Common Dermatophytoses

Disease	Agents	Common Signs	Source
Tinea pedis ("athlete's foot")	*Trichophyton rubrum; T. mentagrophytes* var. *interdigitale; Epidermophyton floccosum*	Red, raised lesions on and around the toes and soles of the feet; webbing between the toes is heavily infected	Human reservoirs in toe webbing; carpeting holding infected skin cells
Tinea cruris ("jock itch")	*T. rubrum; T. mentagrophytes* var. *interdigitale; E. floccosum*	Red, raised lesions on and around the groin and buttocks	Usually spreads from the feet
Tinea unguium (onychomycosis)	*T. rubrum; T. mentagrophytes* var. *interdigitale*	*Superficial white onychomycosis:* patches or pits on the nail surface *Invasive onychomycosis:* yellowing and thickening of the distal nail plate, often leading to loss of the nail	Humans
Tinea corporis	*T. rubrum; Microsporum gypseum; M. canis*	Red, raised, ringlike lesions occurring on various skin surfaces (tinea corporis on the trunk, tinea capitis on the scalp, tinea barbae of the beard)	Can spread from other body sites; can be acquired following contact with contaminated soil or animals
Tinea capitis	*M. canis; M. gypseum; T. equinum; T. verrucosum; T. tonsurans; T. violaceum; T. schoenleinii*	*Ectothrix invasion:* fungus develops arthroconidia on the outside of the hair shafts, destroying the cuticle *Endothrix invasion:* fungus develops arthroconidia inside the hair shaft without destruction *Favus:* crusts form on the scalp, with associated hair loss	Humans; can be acquired following contact with contaminated soil or animals

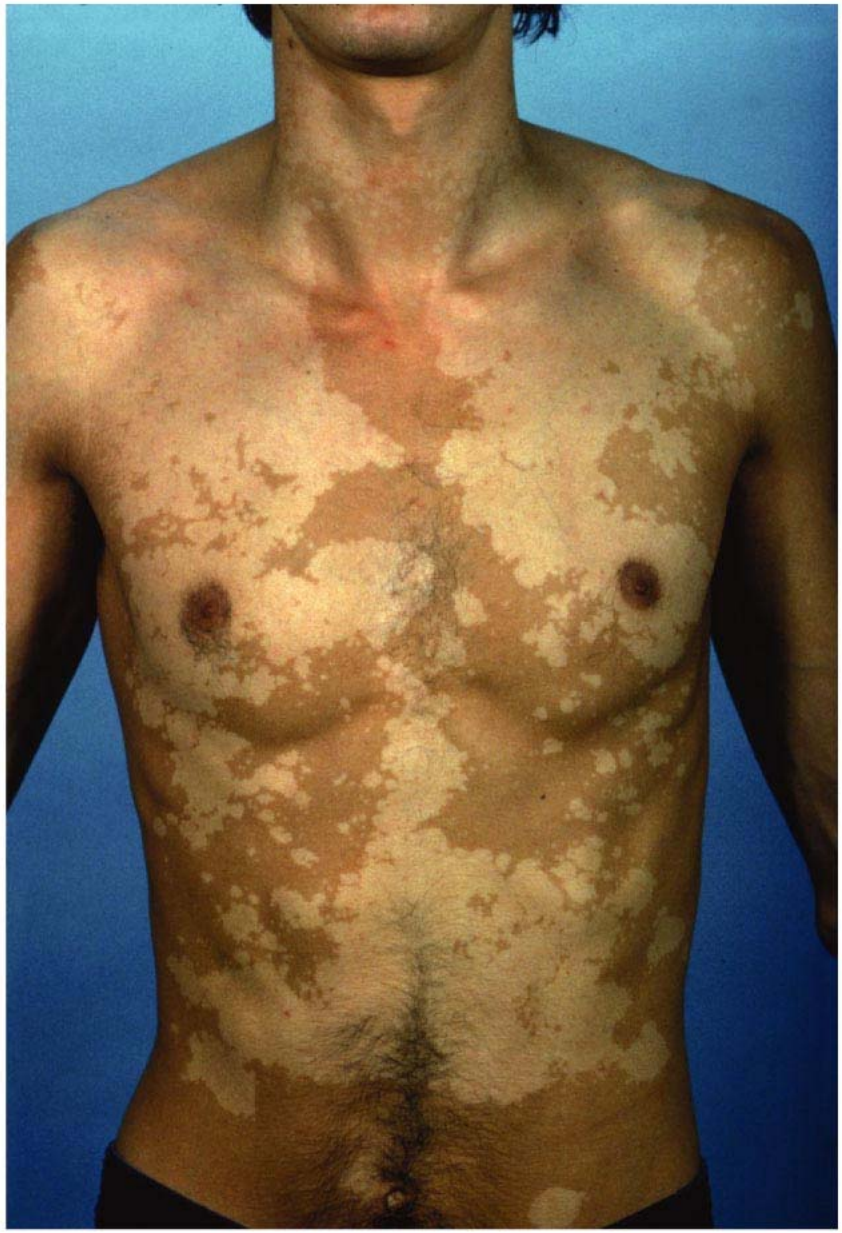


Figure 22.13

Amanita phalloides—death cap

Contains: phalloidin which binds actin and alpha-amanitin which Inhibits mRNA synthesis. Cause liver damage

Figure 22.19