CUTANEOUS AND SUBCUTANEOUS MYCOSES

I. Superficial Mycotic Diseases:

1. Characteristics of Superficial Mycotic Diseases: 
   
   Involves stratum corneum, little pathology, min. inflam response

2. Some Examples of Superficial Mycoses:

   Tinea Versicolor (Pityriasis versicolor) - skin
   Tinea Nigra - skin -> mostly common
   Black Piedra - hair
   White Piedra - hair -> looks like lice -> ox by microscope

3. Tinea Versicolor (Pityriasis versicolor):

   A. Etiologic agent: Malassezia (pityrosporum) furfur

   B. Epidemiology:

   Geographic distribution: Worldwide
   Age: All ages
   Sex: Equally distributed
   * Common in USA

   C. Pathogenesis: Mild, dry lesions, no inflammation

   * Look white on dark skin

   D. Diagnosis: - do scrape

   a. Mycology:

   1) Direct examination of specimen by wet preparation. "Meatballs and spaghetti."

   2) Culture: Not necessary; requires fatty acids; overlay with olive oil

   b. Morphology of fungus in tissue.

   * Often found on neonates b/c they have a lot of fatty acids -> add a catheter & get disseminated ulceration
   * Must be cautious in NICU!!
II. Cutaneous Mycotic Diseases → "ring worm"

- Tinea capitis - hair
- Tinea corporis - skin
- Tinea cruris - groin
- Tinea unguium - nails
- Tinea barbae - face
- Tinea pedis - feet (athlete's foot)

1. Etiologic Agents: 3 Maj. Genera
   - *Microsporum* sp. (15 sp)
   - *Trichophyton* sp. (21 sp)
   - *Epidermophyton floccosum*

2. Communicability: Direct contact with infected object.
   - *Only truly communicable fungal diseases.*
   - Anthrophilic--man to man
   - Zoophilic--animal to man
   - Geophilic--soil to man or animal → in large quantities

3. Microsporosis:
   A. Common etiologic agents in U.S.
      - *Microsporum audouinii* → not much in U.S.; anthrophillic, esp. children
      - *Microsporum canis*
      - *Microsporum gypseum*

   Pathogenesis: Infects hair and skin
   
   Diagnosis: Direct examination of clinical specimen
   - Hyaline, septate hyphae
   - *Scrape skin, kOH prep†* ⇒ see septate hyphae

   Culture: Mold; septate hyphae; large thick-walled, rough-walled, spindle-shaped conidia. Few microconidia.

   a. *Microsporum audouinii*
      - *benign*

   Epidemiology: Man to man contact (Anthrophilic), primarily in children

* Nails: grow in nail bed ⇒ need to go into nail bed for dx. ☺
b. \textit{Microsporum canis} *more pathogenic* → get inflam response
\textbf{w/ EXUDATE, NOT TESS}

Epidemiology: Animal-Animal-Man (Zoophilic)
Usually in children (He more asect, w/animals)

\textbf{c. Microsporum gypseum}

Epidemiology: Soil-Man-Man (Geophilic). Often occurs in adults, ie gardeners

\textbf{B. General Characteristics of Microsporum sp.:} Culture on artificial media;
numerous macroconidia, few microconidia. Macroconidia, large, rough-walled, thick-walled.

\textbf{4. Trichophytosis:} \underline{10-15-04}

\textbf{A. Common etiologic agents in U.S.:} hair, skin \& nails \(\text{(Microsporum no nails)}\)

\begin{itemize}
  \item \textit{Trichophyton mentagrophytes} \\
  \textit{Trichophyton rubrum}  \textbf{large conidia are RARE} \rightarrow \\
  \textit{Trichophyton verrucosum} \textbf{Microconidia, NOT the thick-walled}
  \textit{Trichophyton tonsurans} \textbf{conidia of microsporum}
\end{itemize}

Pathogenesis: Infects hair and skin; often inflammatory

Diagnosis: Direct examination of clinical specimen
Hyaline, septate hyphae

Culture: Floccose to granular colony, septate hyphae with many microconidia in grape-like clusters.

\textbf{a. Trichophyton mentagrophytes: Zoophilic}

Epidemiology: Most common cause of athletes foot in U.S., worldwide in distribution

\textbf{b. Trichophyton rubrum} \(\rightarrow\) red pigment, "fluffy"

Epidemiology: Occurs in children and adults.
Worldwide in distribution.

\(\star\) Chronic, \& often in nails, plus anywhere in body.
c. *Trichophyton tonsurans*

Epidemiology: Worldwide in distribution

d. *Trichophyton verrucosum* 

Epidemiology: Most common in people in contact with animals, esp. farm animals. Occurs in children and adults. 

B. General Characteristics of *Trichophyton* species: 
Numerous microconidia, few macroconidia. When present macroconidia are thin-walled, smooth-walled.

5. Epidermophytosis:

A. Etiologic Agent:

*Epidermophyton floccosum*

Epidemiology: In adults and children; usually adults. Associated with athletes ("Jock Itch"). Anthrophophilic.

Pathogenesis: Infects primarily skin, may be inflammatory. 

Diagnosis: Direct examination of clinical specimen 
Hyaline, septate hyphae → exp. w/ KOH 

Culture: Tan to olive-drab (OD), felt-like colony; septate hyphae; club-shaped macroconidia with 3-4 segments; no microconidia

↓ Smooth walled:
MEDICAL MYCOLOGY

I. Subcutaneous Mycoses

A. Route of infection--Trauma, with injection of fungus into wound.

B. Etiologic Agents:

- \textit{Cladosporium} sp.
- \textit{Fonsecaea} sp.
- \textit{Phialophora} sp.
- \textit{Sporothrix schenckii}

\textbf{1. Chromoblastomycosis}

A. Etiologic agents:

- \textit{Cladosporium} sp.
- \textit{Fonsecaea} sp.
- \textit{Phialophora} sp.

B. Epidemiology: Primarily in Tropics and Subtropical areas of the world.

C. Pathogenesis: Chronic, granulomatous often with secondary bacterial infection.

D. Diagnosis: Culture: Slow growing, dematiaceous fungus.

Histopathology: “Sclerotic bodies” in granulomatous tissue.

E. Microscopic Morphology

\textbf{2. Phaeohyphomycosis}

A. Etiologic agents:

Numerous genera of darkly pigmented (dematiaceous) fungi.

Examples:
- \textit{Wangiella dermatitidis}
- \textit{Exophiala jeansiellmei}
- \textit{Cladosporium} species
- \textit{Bipolaris} species
- \textit{Dreschlera} species
B. Epidemiology: Worldwide. Associated with trauma to the skin, as in farmers, laborers, etc.

C. Pathogenesis: Abscess formation → may have pus → can form anywhere

D. Diagnosis: Pigmented Abscesses

Direct microscopic examination, darkly pigmented hyphae.

Culture: Darkly pigmented fungi.

3. Sporotrichosis

A. Etiologic Agent: *Sporothrix schenckii* → Dimorphic fungus

B. Epidemiology: Reported in all age groups.

Higher prevalence in males (probably occupational relationship).

Worldwide, temperate and sub-tropic areas. → esp in the soil & moss. (some spores may be a bit different)

C. Clinical Form: Ulceration at site of inoculation, lymphatics involved, lesions spread along lymphatics draining site.

D. Diagnosis: Culture: Dimorphic fungus (Mycelium/Yeast)

Yeast, 4-6μ in diameter. Budding. Some cells may be elongate (Cigar shaped). (some spores may be a bit different)

Mold, dirty gray to black mycelium. Delicate septate hyphae bearing tapered conidiophores with small conidia produced at the tip. Conidia often arranged in "flowerettes"

Histopathology: Granulomas or suppuration:

Fungus may not be observed in exudate.

Serology: Agglutination Test.

Not sensitive in systemic disease