Mycology – is the science that study of fungi

Fungi - includes molds and yeasts.

Molds - exhibit filamentous type of growth.

Yeasts - exhibit pasty or mucoid form of fungal growth.

- **Fungi stain gram positive, and require oxygen to survive.**
- **Fungi are eukaryotic, containing a nucleus bound by a membrane, an endoplasmic reticulum, and mitochondria. (Bacteria are prokaryotes and do not contain these)**
- **Fungi are heterotrophic like animals and most bacteria; requiring organic nutrients as a source of energy.**

(Plants are autotrophic)

- **Saprophytes - live on dead organic matter.**
- **parasites - live on living organisms.**

Collection, Handling and Processing of Specimens

- Skin - cleaned with 70% alcohol to remove dirt, oil and surface saprophytes
- Nails - cleaned same as for skin.
- Hair - Use (fluorescence) to help locate infected hair. Hair can be obtained by plucking, brushing, or with a sticky tape
- Body fluids - normal sterile collection procedures

Preparation of Specimens for Transport to Laboratory

- Hair & nails sent in a dry envelope, inside proper container
- Other specimens are usually sent frozen or on dry ice
- Packaging - biohazard regulations. Any growing cultures must be on tube media (not plates). Aluminum screw-capped inner tube with outer cardboard mailing tube
- Inside labeling information: Patient ID, specimen source, suspected organism
- Outside labeling information - must state:
- **WARNING: POTENTIAL PATHOGEN**

Stains Used in Mycology

- Gram Stain - most fungi are gram positive;
- Modified Acid-Fast
- Giemsa Stain – use on blood and bone marrow specimens.
- India Ink - demonstrates the capsule of *Cryptococcus neoformans* in CSF specimens
- Important information
- Tubed media is used rather than plated media because:
  - there is less chance for spore release into the environment
  - less chance for dehydration
  - ease of storage
- The agar in a tube is inoculated in a straight line.
- The agar on plates is Inoculated like a large "S"
- Incubation should be aerobic (and anaerobic if Actinomycetes are suspected)
- Incubate cultures at room temperature & also at 37C if dimorphic fungi are suspected
- Cultures are kept for 4 weeks & should be examined every other day
- Systemic pathogens often require 10 days to 2 weeks

Media Used for Isolation of Fungi

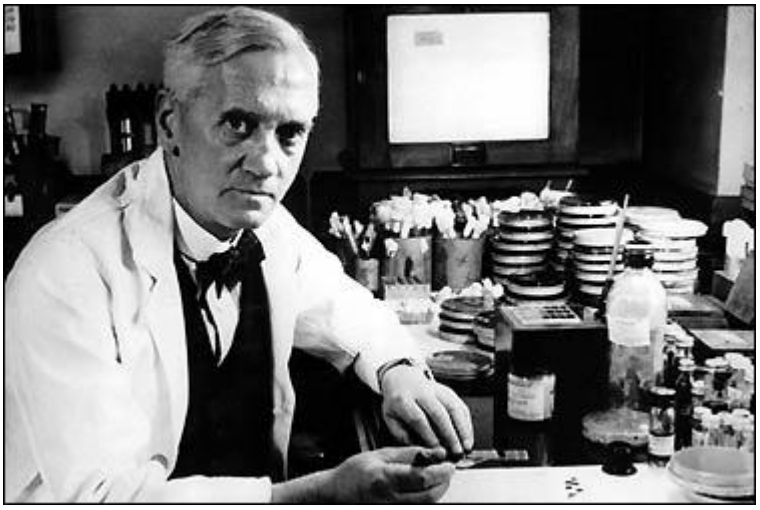
- Sabouraud's dextrose agar (Sab-Dex) - classic medium, recommended for most studies
- Sabouraud's dextrose agar with chloramphenicol - chloramphenicol inhibits bacterial growth

Potato-dextrose agar (PDA)

Colony Morphology (macroscopic features)

- Surface topography - some fungal colonies may cover the entire surface of agar; others grow in a more restricted manner
- Surface texture examples: cottony or wooly (floccose), granular, chalky, velvety, powdery, silky, glabrous (smooth, creamy), waxy

- Pigmentation - fungi may be colorless or brightly colored. Color may be on fungus itself, on its sporulating apparatus, on the agar, or on the bottom of the colony (reverse pigmentation). Pigment color is due to the color of the sporulating apparatus. Pigment can diffuse into the agar. It is important to note the top pigment (obverse); the underside pigment (reverse).



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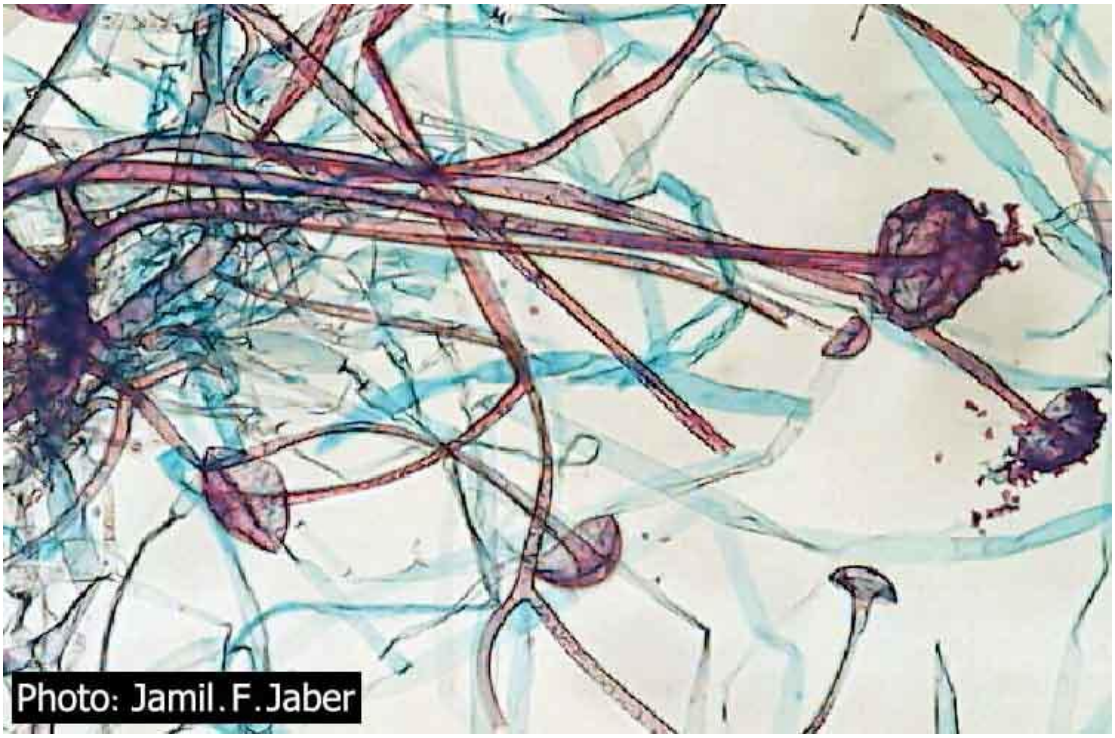
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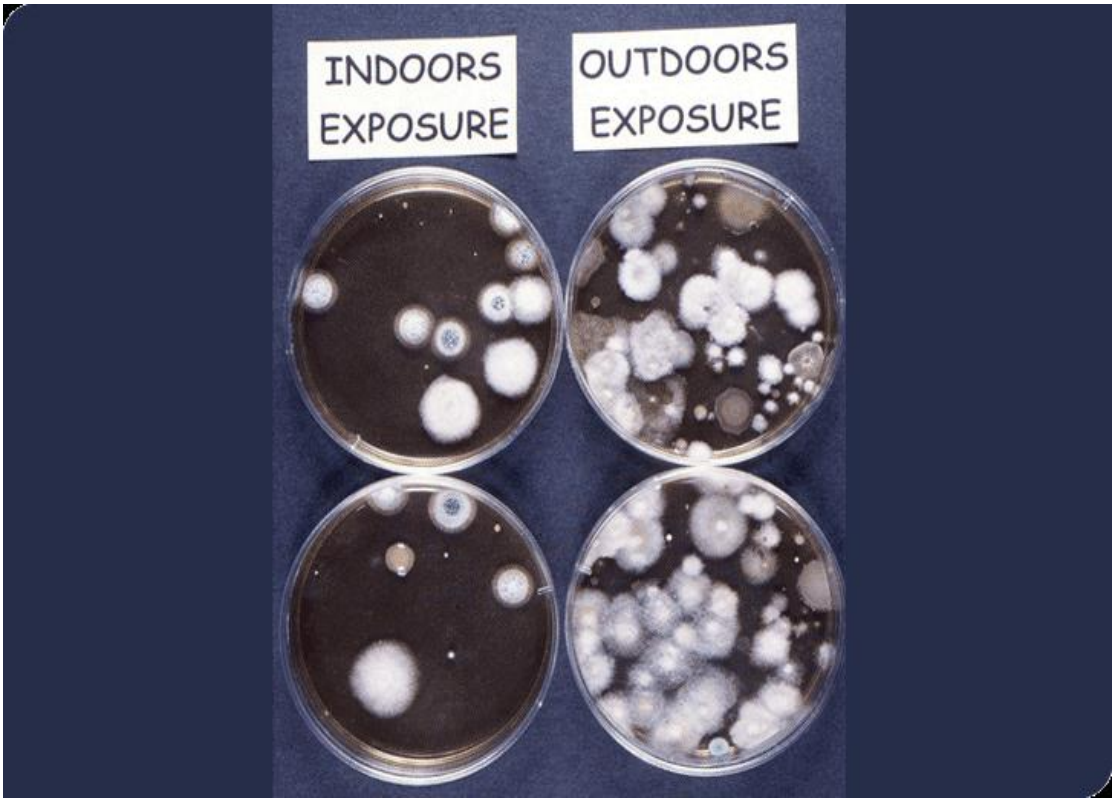
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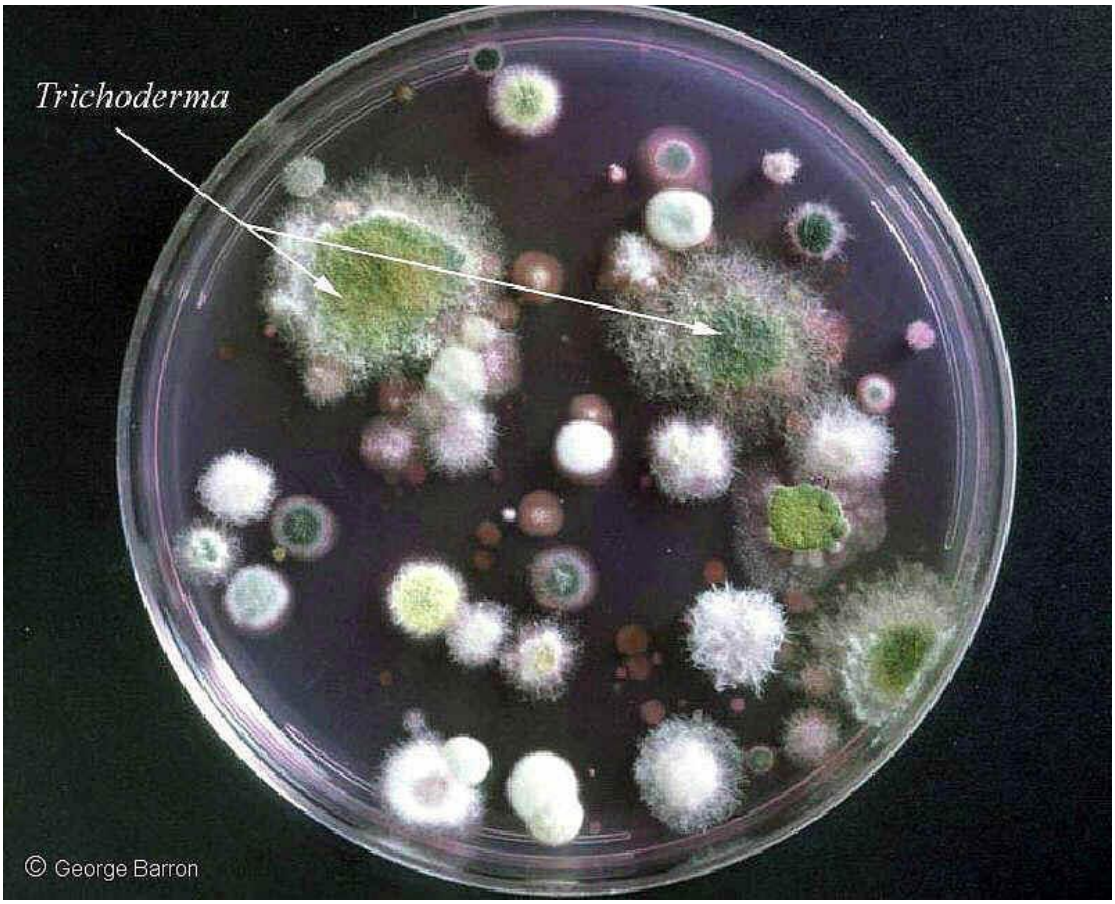
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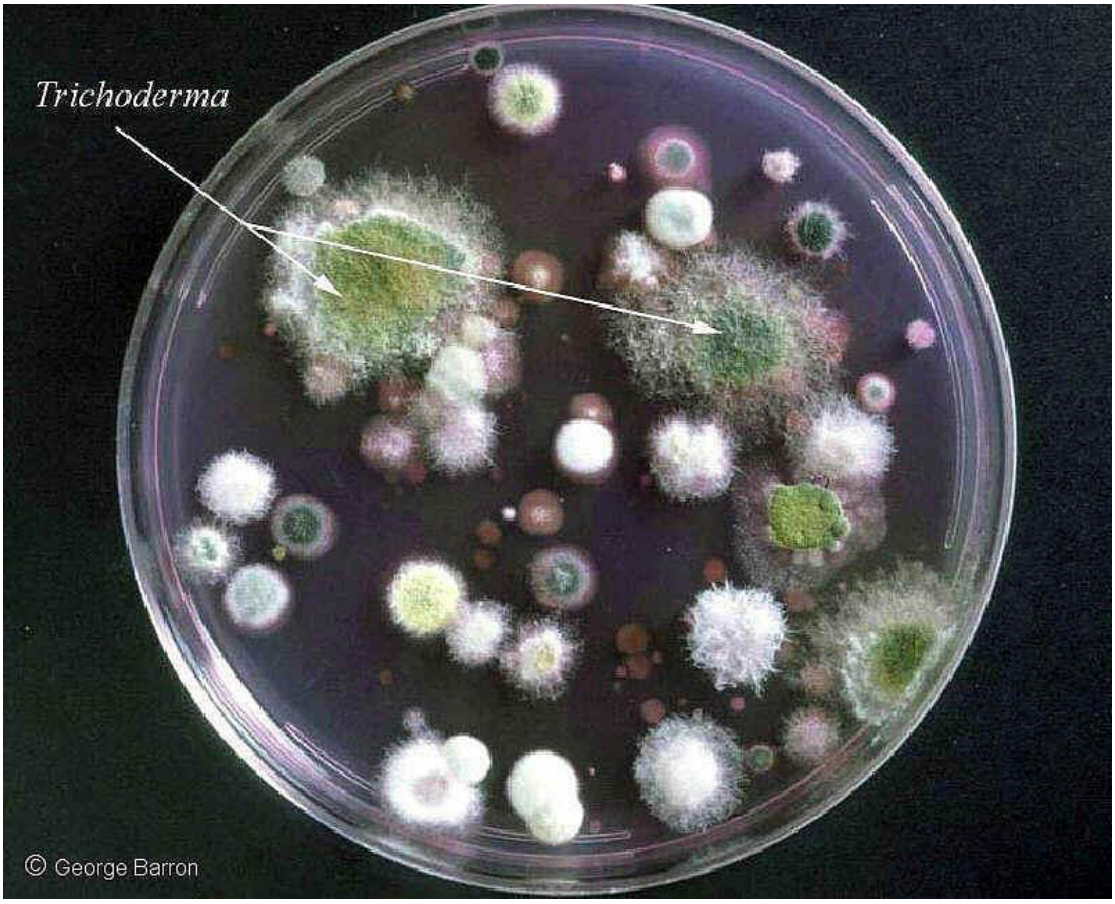
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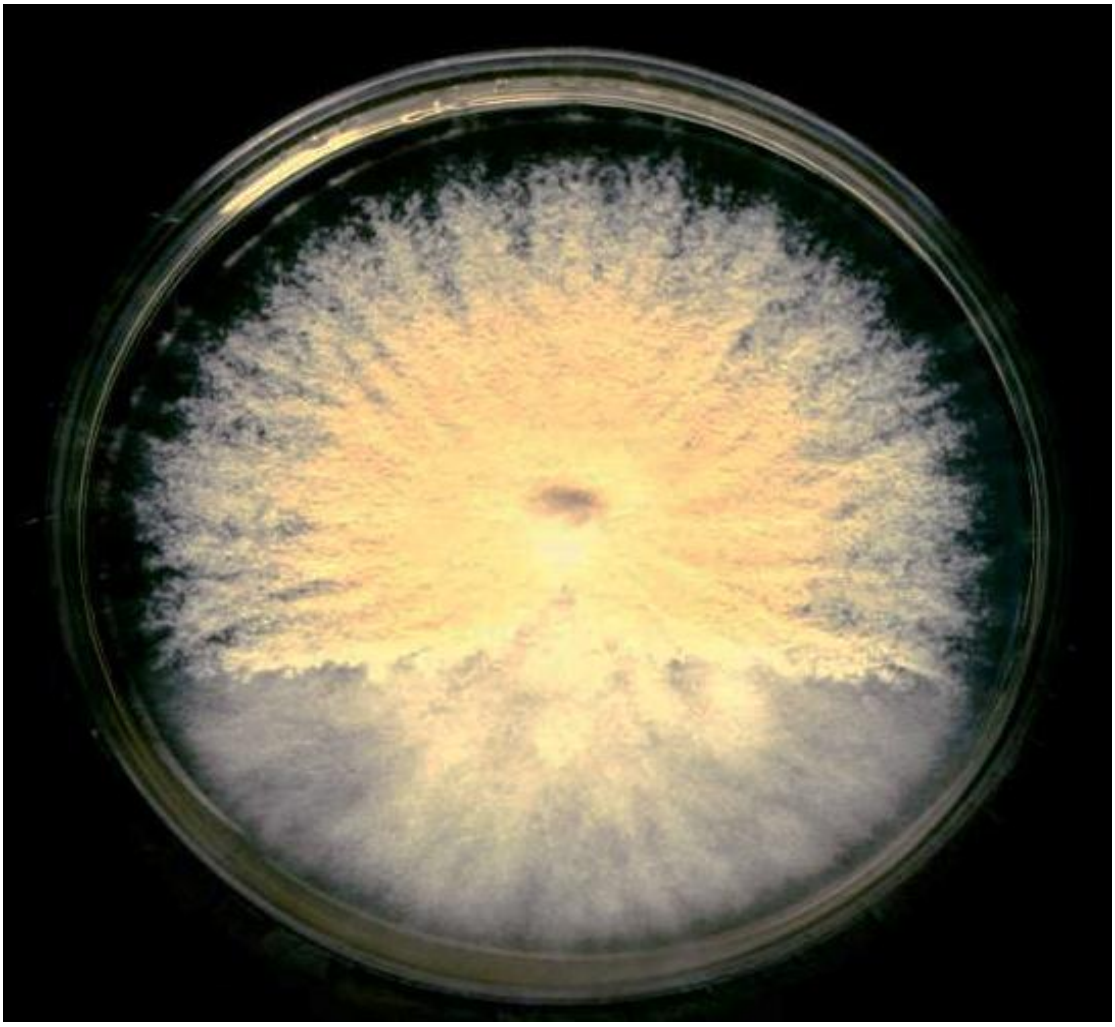


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