Medically Significant Fungi

Clinically Significant Agents of Yeast Infections

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Disclaimer

- This presentation was meant to provide students with both didactic and laboratory skills as they apply to clinical mycology. It is meant for educational purposes only and does not represent Cleveland Clinic views or practices.
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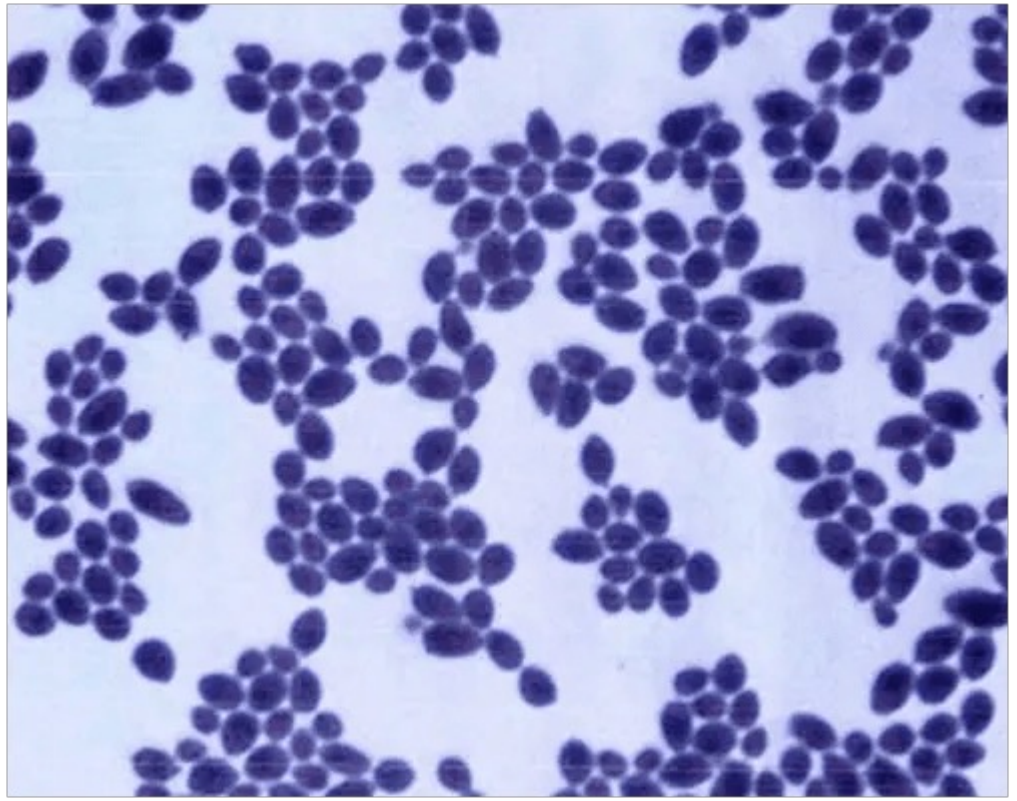
- Most of the information was adopted from the Textbook of Diagnostic Microbiology by Mahon & Lehman (see citation) but condensed for bite sized learning.

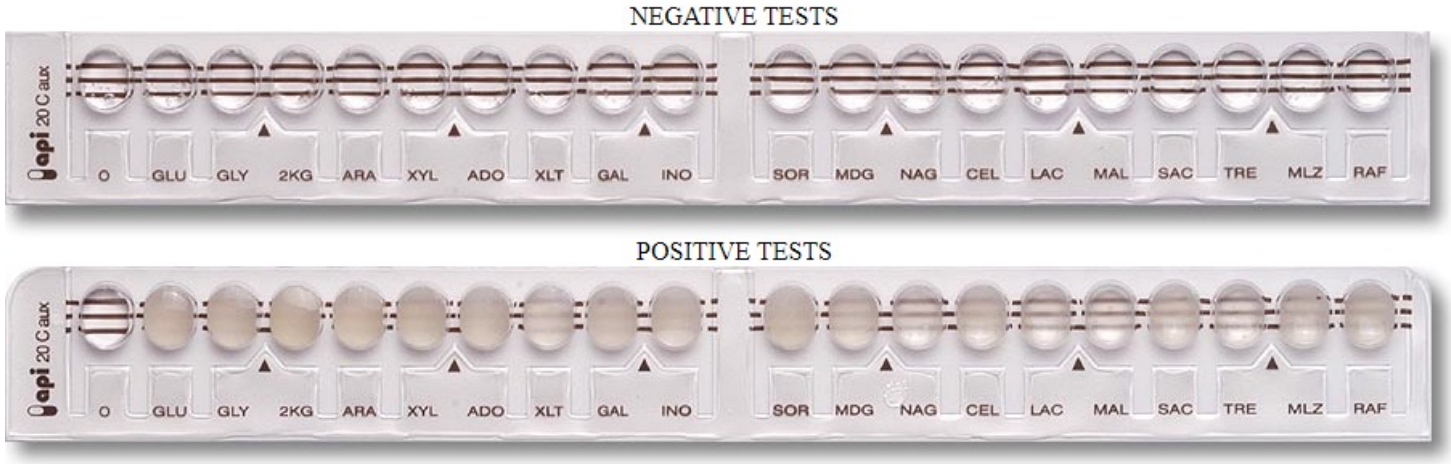
Clinically Significant Agents of Yeast Infections

- With greater immunosuppression, there is an increase in yeast infections.
- Infections are often aggressive and difficult to treat
- Notable genera
  - *Candidia*
  - *Cryptococcus*
  - *Rhodotorula*
  - *Pneumocystis*



Clinically Significant Agents of Yeast Infections

- API 20C [A]
  - Identifies which carbohydrates a yeast can use aerobically as a sole carbon source
- CHROMagar [B]
  - Presumptively identifies *C.albicans*, *C.tropicalis*, and more
  - Identification is based on different colony colors, depending on the breakdown of chromogenic substrates by the different species



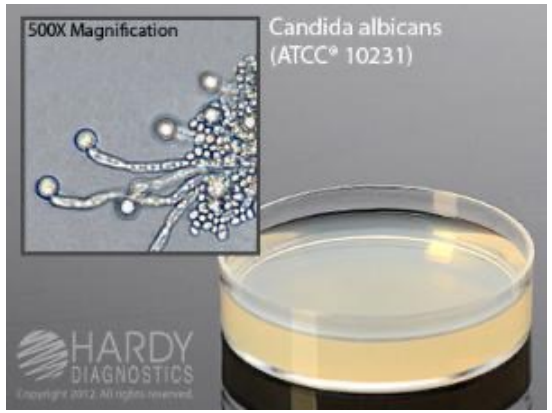
[A]

[B]

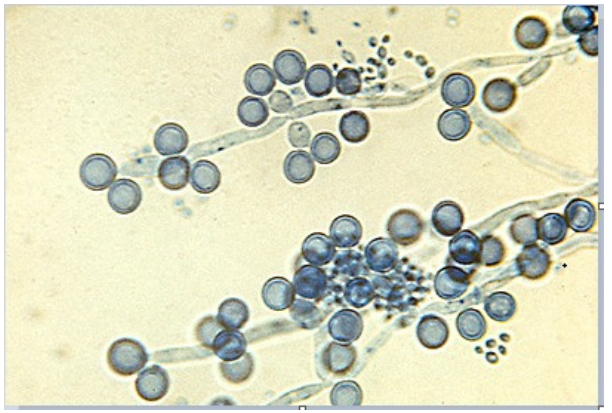
Clinically Significant Agents of Yeast Infections: *Candida* species (Germ Tube +)

Organism	Germ Tube	Urease	CHROMagar	Cornmeal	Growth at 42 ℃	Notable disease
Candida albicans	+	-	Kelly green	Blastoconidia Pseudohyphae Singular terminal chlamydoconidia [B]	+	4th most common cause of bloodstream infections Thrush [D]
Candida dubliniensis	+	-	Hunter green	Blastoconidia Pseudohyphae Double terminal chlamydoconidia [C]	-	Rarely isolated

[A]



[B]



[C]

[D]

Clinically Significant Agents of Yeast Infections: *Candida* species (Germ Tube -)

Organism	Germ Tube	Urease	CHROMagar	Cornmeal	Growth at 42 ℃
Candida glabrata [A]	-	-	Pink/white	Blastoconidia	-
Candida krusei [B]	-	-	Mauve w/ white periphery	Blastoconidia Pseudohyphae	-
Candida tropicalis	-	-	Blue w/purple haze		-
Candida parapsilosis [C]	-	-	Pink/white		-

Candida krusei is intrinsically resistant to fluconazole

[A]

[B]

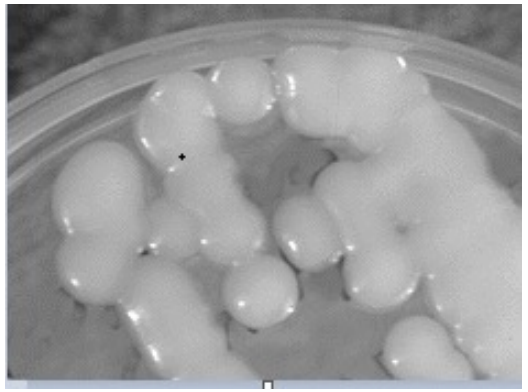
[C]

Clinically Significant Agents of Yeast Infections: *Candida auris*

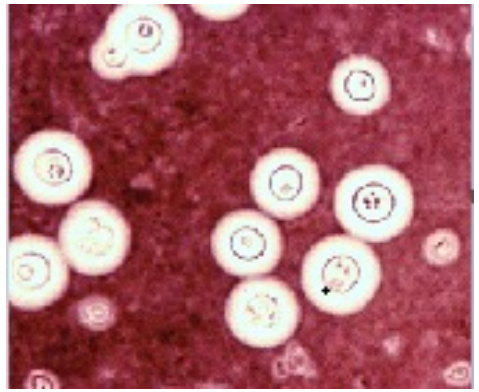
- *Candida auris*
  - Hospital –acquired infection
  - Multidrug-resistant yeast- high mortality rates

Clinically Significant Agents of Yeast Infections: *Cryptococcus species*

Organism	Notable disease	Host	Habitat	Identifying characteristics
Cryptococcus neoformans	Meningitis, pulmonary disease, septicemia	Immunocompromised (AIDS)	pigeon droppings	Capsule [A] Germ tube - Urease + India ink[B] Blastoconidia only[C] Phenol oxidase [D]
Cryptococcus gattii		Immunocompromised/competent	eucalyptus	



[A]



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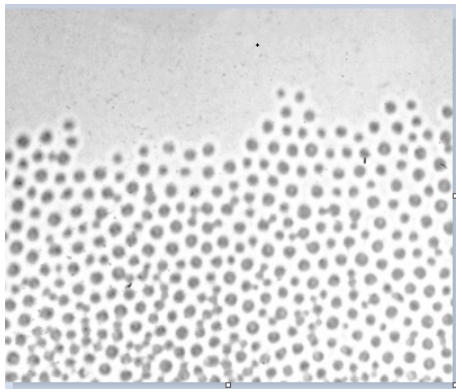

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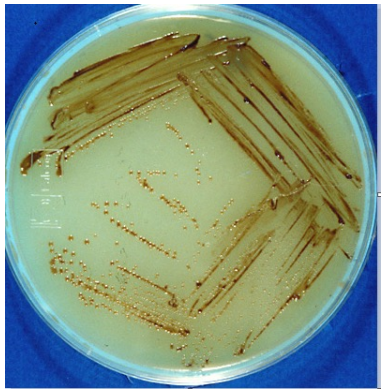
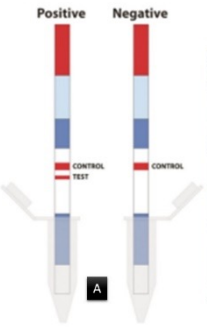


[D]



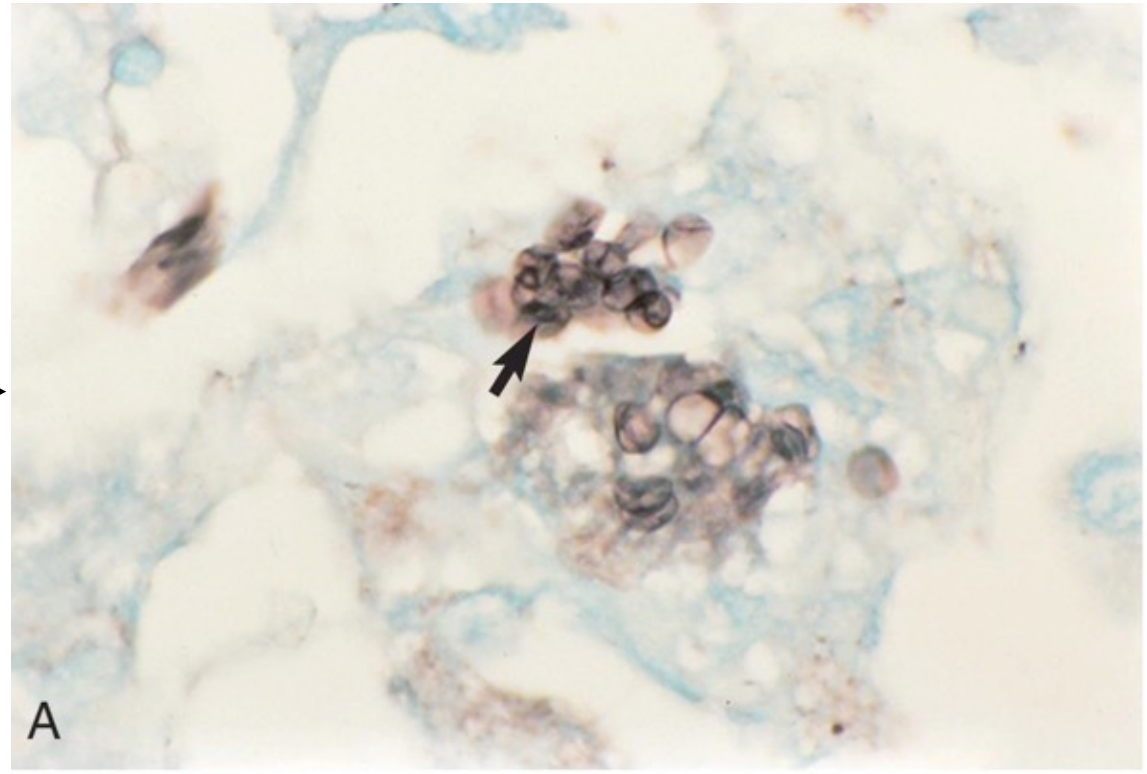
[E]

Clinically Significant Agents of Yeast Infections: *Rhodotorula species*

- Not common agents of disease, but can cause opportunistic infections
- Resemble cryptococci because they bare a capsule and are urease positive

Clinically Significant Agents of Yeast Infections: *Pneumocystis*

- Cause severe pneumonia in immunosuppressed hosts
- Diagnosis made by finding the organism in respiratory specimens using histology stains (ex. GMS)
- Cells have a punched-out ping-pong ball appearance



Clinically Significant Agents of Yeast Infections: Yeast susceptibility testing

- YeastONE trays – colorimetric readout similar to bacterial AST trays
  - Blue= No growth
  - Pink= Growth

Citations

- Mahon, C. R., & Lehman, D. C. (2023). *Textbook of Diagnostic Microbiology* (7th ed.). Elsevier.