

NAME _____

EXAM 3
April 27, 2004
BIO 329

Directions: All explanations, definitions, and descriptions should be presented in good English. This means complete sentences should be used except when lists or fill-in-the-blanks are required. Spelling of mycological terms should be accurate. Slight misspellings may be overlooked, but major misspellings will result in wrong answers.

1. Multiple choice (20 pts at 2 pts each); circle the number of the correct choice.

a. The form-family Cryptococcaceae of the Fungi Imperfecti includes the "pathogenic yeast" form-genus/form-genera

- 1. *Cryptococcus*
- 2. *Malassezia*
- 3. *Candida*
- 4. *Trichosporon*
- 5. all of the above
- 6. none of the above (1 to 4).

b. Modern epidemiological data from sentinel surveillance studies of candidiasis in neonates suggest that after *Candida albicans* the most common infecting species is

- 1. *C. glabrata*
- 2. *C. parapsilosis*
- 3. *C. tropicalis*
- 4. *C. krusei*
- 5. none of the above because candidiasis is not known among neonates
- 6. all of the above (1 to 4) because each seems to cause equal numbers of infections in neonates

c. A relatively newly described species of *Candida* was recently found to have caused the first four cases of disease by that fungus in North America. That fungus, which you read about in the reserve readings, was identified as

- 1. *C. glabrata*
- 2. *C. krusei*
- 3. *C. parapsilosis*
- 4. *C. famata*
- 5. *C. guilliermondii*
- 6. none of the above

- d. Among the five most common agents of candidiasis, only one has been induced to form ascospores. That form-species is
1. *C. albicans*
 2. *C. glabrata*
 3. *C. krusei*
 4. *C. parapsilosis*
 5. *C. tropicalis*
 6. none of the above
- e. Between the teleomorph and anamorph of *Filobasidiella (Cryptococcus) neoformans*, a total of five varieties are formally recognized. These varieties do not include
1. var. *neoformans*
 2. var. *duboisii*
 3. var *grubii*
 4. var. *bacillospora*
 5. var *gattii*
 6. any of the above, because there are no recognized varieties of this species.
- f. Neutropenia is most associated with aspergillosis and
1. cryptococcosis
 2. histoplasmosis
 3. blastomycosis
 4. candidiasis
 5. coccidioidomycosis
 6. none of the above except aspergillosis
- g. So-called life cycle dimorphism is associated only with the fungal pathogen of humans that causes
1. candidiasis
 2. coccidioidomycosis
 3. blastomycosis
 4. histoplasmosis
 5. cryptococcosis
 6. none of the above mycoses
- h. The mycosis most associated with habitats that harbor the European Starling is
1. histoplasmosis
 2. cryptococcosis.
 3. coccidioidomycosis
 4. blastomycosis
 5. candidiasis
 6. none of the above is associated with that particular bird

- i. The agents of histoplasmosis, blastomycosis and coccidioidomycosis are all considered to be Ascomycota species of the order
1. Saccharomycetales.
 2. Tremellales.
 3. Eurotiales.
 4. Onygenales.
 5. Ustilaginales.
 6. none of the above.
- j. Although the molecular methods for genetic transformations and gene disruptions in pathogenic fungi have been difficult to derive, your outside reading should have suggested that they exist for the agent of
1. candidiasis.
 2. histoplasmosis.
 3. blastomycosis.
 4. cryptococcosis.
 5. coccidioidomycosis
 6. all of the above.

2. Fill in the blanks (40 pts at 2 pts each).

- a. The form-species *Coccidioides immitis* has recently been divided into two species based largely on molecular phylogenetic analysis. The new species was given the name *Coccidioides* _____.
- b. The ecological environment that harbors the agents of coccidioidomycosis is best described as the _____.
- c. The tissue-phase (in vivo morphology) of the agents of coccidioidomycosis is the _____.
- d. The conidia of the agents of coccidioidomycosis are best described as _____ conidia.
- e. The conidia of *Ajellomyces capsulatus* are best described as _____.
- f. Dysgenics of the thymus, familial juvenile hypoparathyroidism and hypoadrenocorticism, and thymoma are clinical manifestations associated with patients with a type of candidiasis known as _____.
- g. The common name given to candidiasis of the tongues of children and adults is _____.
- h. Probably the most common presenting symptom for CNS cryptococcosis in both HIV⁺ and HIV⁻ patients is _____.

- i. The anamorph of the African strains of histoplasmosis are referred to as *H. capsulatus* var. _____.
- j. Acquisition of protective immunity is most associated with the endemic mycoses _____ and _____.
- k. Predominantly intracellular yeast growth is mostly associated with the endemic primary pathogen _____.
- l. The clinical name for valley bumps is _____.
- m. The most highly endemic specific area for coccidioidomycosis in California is the _____.
- n. As far as is known, the only spores produced by the agent of cryptococcosis are _____.
- o. Among the endemic mycoses, progression to skin lesions in the absence of antifungal intervention is probably most associated with _____.
- p. Spelunkers disease is the common name given to a type of _____.
- q. The chemotypes of *Cryptococcus neoformans* are differentiated on the basis of their structural reporter groups which are collectively known as _____.
- r. The disseminating fatal form of coccidioidomycosis has traditionally been referred to as _____.
- s. Pigeon-breeder's disease is the common name for a chronic pulmonary form of _____.

3. Short answers/definitions (20 pts at 5 pts each).

- a. Yeast, pseudohyphae, true hyphae, germ tubes, chlamyospores of *Candida albicans* (this can be as a list of short descriptive phrases for each, but please no diagrams).

- b. The traditional “minimal essential” information for the identification of *Candida albicans* (this can be as a list).

- c. With short descriptive phrases (this can be in a list, but no diagrams, please), list the steps that perpetuate the dikaryotic condition in *Filobasidiella neoformans*

- d. Steps in the tissue dimorphism of *Coccidioides immitis* (this can be a list, if you want, but no diagrams, please).

4. **Essays:** Below please find two exam topics for you to respond to in essay fashion (see comments on page 1 about sentences and spelling). Please provide your responses on the attached lined sheets. If you write normal size, then your responses should be no more than two pages long. Should you need additional space just use the backs of each lined page, or other pages of the exam.
- A. Topic 1 (10 pts).** Compare and contrast the two mycoses known as cryptococcosis and coccidioidomycosis. Focus your essay on the clinical aspects of the diseases including their immunological relationships with the host, symptoms, chemical manifestations, diagnosis, and treatments. Do not discuss the biology of the fungi involved (please no taxonomy, lengthy tissue form discussions, etc.).
- B. Topic 2 (10 pts).** During the semester you have been assigned numerous mini-reviews and review paper readings ("Sz Readings") to supplement my lecture material and up-date your textbook assignments. To document that you have done these readings, please discuss the reading Sz 22 (Soll, D. R., S. R. Lockhart, and R. Zhao. 2003. Relationship between switching and mating in *Candida albicans*. *Eukaryot. Cell.* 2:390-397) in such a way that your essay strongly suggests you did read at least this particular review. I suggest the best way to do this is to focus your essay on the switching aspects presented, which were not covered in lecture to the same extent as the mating aspects.