NAME_____

EXAM 1
February 18, 2003
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 @ 2 each): circle the number of the correct choice.

   a. Agents of mycosis may be

      1. saprobes and endosaprobes
      2. commensals
      3. facultative pathogens
      4. obligate pathogens
      5. all of the above

   b. A very well known disease agent associated with the AIDS epidemic has recently been determined to be a fungus and not a protozoan. That fungus is

      1. *Malassezia furfur*
      2. *Pneumocystis carinii*
      3. *Candida albicans*
      4. *Rhinosporidium seeberi*
      5. none of the above fungal-like protests.

   c. The Kingdom Fungi as we know it today does not include the Phylum

      1. Myxomycota
      2. Plasmodiophoromycota
      3. Hyphocytridiomycota
      4. Oomycota
      5. any of these choices

   d. Current evidence supports the concept that the Kingdom Fungi had its original evolutionary origin among eukaryotic heterotrophic species

      1. that produced biflagellate zoospores
      2. that derived lysine via the diaminopimelic acid biosynthetic pathway
      3. that were nonzoosporic
      4. that produced anteriorly flagellated cells having flagella of the tinsel-type
      5. none of the above choices

e. The evolutionary history (phylogeny) and biology of a fungus is reflected best

1. when it is included in the taxon known as the Fungi Imperfecti
2. by its proper classification
3. by its holomorphic species name
4. by its identification as a yeast or as a mold
5. none of these choices

f. Fungi that produce their ascospores in an ascocarp/ascoma called a perithecium are classified among the

1. Hemiascomycetes
2. Discomycetes
3. Pyrenomycetes
4. Archiascomycetes
5. none of these choices

g. Some, but not all, fungi that produce a basidium from the germ tube produced by a germinating dikayrotic spore called a teliospore are included in the fungal class

1. Ustomycetes
2. Holobasidiomycetes
3. Hyphomycetes
4. Phragmobasidiomycetes
5. none of these Ascomycota classes

h. Dolipore septa are frequently associated with the hyphae of

1. Ascomycota
2. Basidiomycota
3. Chytridiomycota
4. Zygomycota
5. none of these phyla

i. Asexual yeasts are included in the Form-class

1. Blastomycetes
2. Hyphomycetes
3. Coelomycetes
4. Mycelia Sterilia
5. none of these choices

j. The karyospore of the Zygomycota is called a

1. sporangiospore
2. conidium
3. ascospore
4. basidiospore
5. none of these choices

3. Short answers/definitions (20 pts @ 4 pts each) in one or two complete sentences and not in phrases of only a few words.

   a. Define the word fungus (feel free to try and improve upon my somewhat imperfect one).

   b. Vesicle-mediated apical growth

   c. Holoarthric conidiogenesis

   d. The Amastigomycotera

   e. Heterothallism in fungi

2. Fill in the blanks (30 pts @ 2 pts each).

   a. The most common tissue reactions of humans to a fungal invader in CMI-competent patients result in the formation of _____.

   b. A mononuclear phagocyte that has left the blood stream and migrated to other tissues is most likely some type of _____.

   c. Primary pulmonary mycoses associated with restricted areas of the world are often said to be _____ mycoses.

   d. Mycoses that are most often associated with the immunocompromised patient are often said to be _____ mycoses.

   e. A hyphal septum having a central septal pore and associated _____ is called a _____ septum.

   f. Entroblastic conidia are produced by cells called _____ or _____ depending on whether the zone of spore detachment is or is not hidden by a collar on the conidiogenous cell.

   g. The cluster of microvesicles that helps mediate apical hyphal growth in Ascomycota, Basidiomycota and their related Fungi Imperfecti is called a _____.

   h. The asexual phase, or morph, of a fungus is currently referred to as its _____.

   i. Hyphae with clamp connections are classified in the Phylum _____.

   j. Filamentous fungi that are asexual, as far as is known, and produce exogenous mitospores in the absence of a conidioma are included in the Form-class _____.

   k. Ascocarps/ascomata that are often cup-shaped and on which asci form in confluent layers over most of their external surfaces are termed _____.

   l. Because of recent results from molecular phylogenetic studies, fungi that do not form ascocarps in association with meiosis and ascospore formation, are now included either in the class _____ or the class _____.

4. **Essays:** Below please find two exam topics and two bonus topics (answer only <u>one</u> of the Bonus questions) 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 your responses should be about one page long for each essay. Should you need additional space just use the backs of each lined page, or other pages of the exam.

   A. Essay 1 (15 pts). Two very different types of drugs are used today to treat the majority of life-threatening mycosis. Identify these two drug types by class or family, as well as one specific member of each class, and then describe their basic chemical structures, fungal cellular targets, and different modes of action.

   B. Essay 2 (15 pts). For years the property of dimorphism has been assumed, with little direct evidence, to have special relevance to medical mycology and possibly to be a major virulence factor in some species. Explain what is meant by this term, and how dimorphism is manifested among medically important species (is the expression of dimorphism the same or different among the different pathogens?).

5. **Bonus:** 5 pts (optional; e.g. there will not be a credit reduction for no answer or a wrong answer).

   It appears that the relationships of the Fungi Imperfecti species to their Ascomycota and Basidiomycota kin are being clarified to the extent that the former non-phylogenetic taxon may soon become obsolete. In spite of this, the concepts that have come to be associated with the Fungi Imperfecti will probably still have relevance to mycology for years to come. Please attempt to explain why that might be.

   <u>or</u>

   Your professor has chosen not to lecture to any extent on *Pneumocystis* pneumonia (PCP) because the terminology associated with its agents is still not standardized very well in a mycological sense. Nevertheless, he has assigned you with reading materials related to this fungus. Based on these readings, provide evidence that you have acquired some knowledge about *Pneumocystis* through your reading of those materials.