Medicinal Chemistry 401, 561P

Hour Examination

May 28, 2008

NAME: KEY

Good Luck!

MDCH 401/561P Exam 3
May 28, 2008

Name: KEY

Grade:_____

Fill in your scantran with the correct choice for the questions below:

1- The following statements about fungi are correct except:

a. They are eukaryotic cells containing nuclei, mitochondria, ER, golgi, 80S ribosomes, etc.
b. The fungal kingdom contains molds yeasts and mushrooms.
c. Invasive fungal infections can easily be managed with vancomycin.
d. In general most fungi are beneficial and participate in biodegradation.

2- Invasive fungal infections increased in the last 20 years due to:

a. Widespread use of antiviral agents.
b. Rapid mutation in yeasts and molds.
c. Increase in immunocompromised patients due to HIV and increase in number of organ transplantation.
d. All of the above.

3- Superficial mycoses are usually caused by:

a- Dermatophytes
b- Aspergillus
c- Candida Albicans
d- Cryptococcus neoforman

4- Opportunistic systemic mycoses are normally of marginal pathogeneticity but can

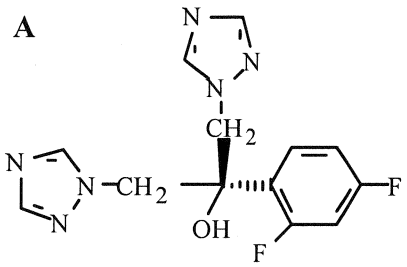
a- Cause serious problems in immune competent patients
b- Most commonly arise from Candida Albicans and Aspergillis infections.
c- Disseminate due to hematogenous spreading from initial locus of infection.
d- b and c together.

5- Caspofungin is a β-glucan synthesis inhibitor. Therefore it compromises the integrity of fungal cell membranes and causes them to become leaky.

a- The above statement is **True**
b- The above statement is **False**

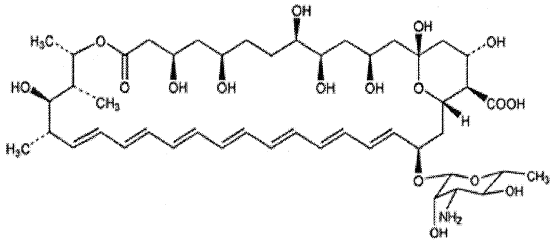
Use the structures and accompanying lettered choices to answers questions 6-12 below.

A



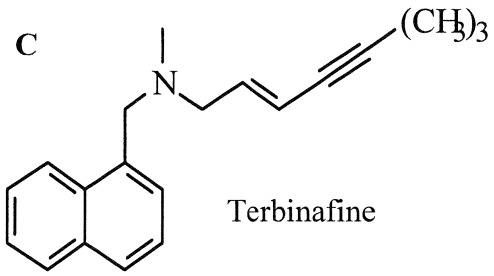
Fluconazole

B



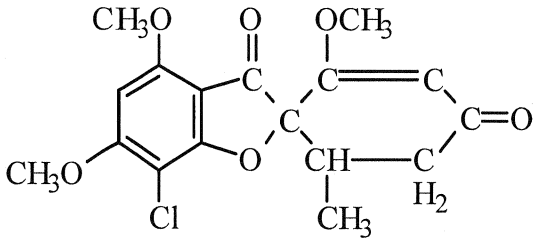
amphotericin B

C



Terbinafine

D



Griseofulvin

6- Achieves high levels in cerebrospinal fluid and used as follow-up therapy for cryptococcal meningitis:

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

7- Inhibits ergosterol synthesis by blocking squalene monooxygenase.

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

8- Still the Gold standard for invasive systemic fungal infections

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

9- Not absorbed orally but rather given as a colloidal dispersion by slow IV infusion.

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

10- Inhibits mitotic spindle formation and causes aplastic anemia:

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

11- May inhibit several cytochrome P450 isozymes and its metabolism is induced by rifampin

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

12- Is used in combination with flucytosine to prevent the rapid emergence of resistance to the later.

a- Fluconazole
b- Amphotericin B
c- Terbinafine
d- Griseofulvin

13- Viral infections are usually treated with antibacterial agents and vaccines.

a- The statement above is **True**
b- The statement above is **False**

14- Ganciclovir is used to treat cytomegalovirus (CMV) infections but the dose needs to be adjusted in cases of renal failure.

a- The statement above is **True**
b- The statement above is **False**

15- The Herpesviridae family of viruses are:

a- Large single stranded RNA viruse
b- Responsible for infections including CMV, chicken pox and influenza
c- Life long, i.e. after a primary infection with a herpes virus the infection stays for life.
d- All of the above.

16- The Influenza viruses belong to the orthomyxovirus family and:

a- Have neuraminidase in their envelope glycoprotein that helps the virus penetrate mucus to reach epithelial cells and is crucial for escape from the infected cells.
b- Acyclovir is the only nucleoside analog that is active against the influenza virus.

c- The second envelope glycoprotein, hemagglutinin is necessary for viral replication.
d- All of the above.

17- Flu virus has three subtypes and:

a- Subtype A can infect humans, birds and animals but does not cause any respiratory illnesses in humans.
b- Subtype A mutates by both antigenic drift and shift while subtype B mutates by antigenic drift only.
c- Only subtype C is responsible for the recorded epidemics and pandemics.
d- Amantadine is effective against both type A and B but its use is limited due to its CNS effects.

18- Neuraminidase inhibitors shorten the duration of the flu by 1-2 days but:

a- They should be taken within 48 hours of the onset of symptoms.
b- Can be given for prophylaxis if subject is exposed but they are less effective.
c- Zanamivir has to be given as an aerosol while Oseltamivir is given orally.
d- All of the above.

19- Ribavirin is active against many DNA/RNA viruses and highly active against influenza A and B, but is only approved for treating RSV in infants.

a- The statement above is **true**
b- The statement above is **false**.

20- The HIV virus is:

a- A typical retrovirus that contains one copy of the RNA genome.
b- Hard to cure but can be treated with several anti-HIV therapies.
c- Stable and mutations are rare
d- All of the above.

21- Anti-HIV agents attack the virus at different stages during its life cycle. However:

a- Integrase inhibitors inhibit the binding of the virus to the cell membrane.
b- Protease inhibitors will only work if the virsus is in its latent form.
c- Reverse transcription inhibitors will not work if the viral DNA has migrated to the cell nucleus.
d- Membrane fusion inhibitors interfere with the viral protein synthesis during replication.

22- Non-nucleoside reverse transcription inhibitors were developed since:

a- Nucleoside reverse transcription inhibitors only act as DNA synthesis terminators.
b- They non-competitively inhibit viral RNA dependent DNA polymerase.
c- High resistance developed for nucleoside reverse transcription inhibitors.
d- They have much better solubility and can be given orally.

23- HIV protease inhibitors block cell to cell spread of new viruses to host cells:

a- The above statement is **true**.

b- The above statement is **false**.

24- Combination therapy to control HIV can include

a- Two nucleoside reverse transcription inhibitors since the combination is synergistic.
b- One nucleoside reverse transcription inhibitor and one non-nucleoside reverse transcription inhibitor.
c- Two non-nucleoside reverse transcription inhibitors
d- None of the above.

25- Enfuvirtide and Maraviroc are two new agents approved via the fast track for addition to the anti-HIV arsenal.

a- Enfuvirtide is a peptide drug that inhibits viral proteases.
b- Maraviroc is only approved for IV administration while Enfuvirtide is administered orally.
c- Maraviroc inhibits the fusion of the virus to CD-4 cells.
d- Maraviroc and enfuvirtide help control HIV even when it is resistant to other therapies.

26- It is important for Pharmacy students to learn about vaccines because;

a- It is covered in class and included on the hour exam.
b- Pharmacists play an important role in educating patients about the importance, safety and recommendations of different vaccines.
c- Drugs can sometimes be used to treat vaccine preventable diseases.
d- None of the above.

27- The perfect vaccine is:

a- Cheap, oral, stable at room temperature and does not require booster shots.
b- Useful for both humans and animals.
c- Suitable for persons under 2 years and over 65 years.
d- Elicits an immune response mediated by IgA but not IgM

28- The Vaccine Adverse Event Reporting System (VAERS) is.

a- Administered by the FDA and CDC.
b- Required by law and therefore all healthcare providers who do not report vaccine adverse events suffer a penalty.
c- 8 HMOs are currently participating in this system.
d- None of the above.

29- Immunity gained from **live attenuated** viral vaccines is:

a- Dependent on type of vaccine administered.
b- Part of the cell mediated immunity.
c- Classified as natural active immunity.
d- Classified as artificial active immunity.

30- The primary immune response is mediated by IgM while IgG are responsible for the secondary immune response:

a- The statement above is **true**.
b- The statement above is **false**.

31- The following statements about active and passive immunity are true except:

a- Active immunity is more long term than passive immunity.
b- Natural active immunity includes the maternal transfer of IgA via nursing to a child.
c- Artificial passive immunity includes the transfer of hyperimmune serum from horses.
d- Both active and passive immunity can be natural or artificial.

32- The following are all part of the innate immune response except:

a- Acidic pH of skin secretions.
b- Natural gut flora.
c- Cadida in the vaginal tract.
d- Helper T-cells

33- The more similar a vaccine is to the disease-causing form of the organism, the better the immune response to the vaccine.

a- The above statement is **true**.
b- The above statement is **false**.

34- There is always a fear from developing the disease if the vaccine administered is:

a- A conjugated polysaccharide vaccine.
b- Live attenuated virus vaccine.
c- Inactivated partial virus vaccine.
d- Both b and c.

35- Administration of live attenuated vaccines will be affected by circulating antibodies because:

a- Virus needs to replicate to elicit an immune response and antibodies may interfere with viral replication.
b- The virus may not be weakened enough and therefore no immune response will be developed.
c- Immunity from circulating antibodies usually lasts for 3 months and then the vaccine will start working afterwards.
d- No booster response will be developed if the vaccine is given when antibodies are already in circulation.

36- Inactivated vaccines:

a- Do not require replication to elicit an immune response.
b- Less effective than live attenuated vaccines.
c- Illicit mostly a humoral response.
d- All of the above.

37- Conjugated polysaccharide vaccines were developed because:

a- Pure polysaccharide vaccines are not immunogenic in children younger than 2 years or adults older than 65 years.
b- Pure polysaccharide vaccines do not elicit a booster response.
c- Pure polysaccharide mediated antibodies are more functionally active.
d- Both b and c.

38- Diphtheria is:

a- Toxin mediated disease.
b- Toxin is only released when *C. diphtheriae* is infected by virus (phage) carrying the tox gene.
c- Can be treated with antibiotics such as erythromycin.
d- All of the above.

39- Aluminum hydroxide and 2-phenoxy ethanol are usually added to a vaccine because:

a- Aluminum hydroxide is a stabilizer and 2-phenoxy ethanol is a solvent.
b- 2-phenoxy ethanol is an adjuvant while aluminum hydroxide is a preservative
c- Aluminum hydroxide is a preservative and 2- phenoxy ethanol is a stabilizer.
d- Aluminum hydroxide is an adjuvant and 2- phenoxy ethanol is a stabilizer.

40- Thimerosal is an organic mercury sulfur salt used in multiple dose vaccines as a preservative and has been banned from all childhood vaccines.

a- The above statement is **true**.
b- The above statement is **false**.

41- Diphtheria tetanus and pertussis are:

a- Toxin mediated diseases.
b- Can all be treated with erythromycin
c- Vaccine preventable viral diseases
d- Diseases where initial infection grants lifelong immunity.

42- Tetanus is the only vaccine preventable disease that is not communicable.

a- The above statement is **true.**
b- The above statement is **false.**

43- The recommended schedule for the DTaP vaccine in the US is:

a- At 2, 4, 6, 12-18 months.
b- At 0, 2, 4, 6, 15-18 months then every 10 years
c- At 2, 4, 6, 15-18 months, 4-6 years, 11-12 years then every ten years.
d- None of the above

44- Pertussis is highly contagious and:

a- Has an incubation period range of 1-2 days.
b- Fever is usually mild throughout the course of the illness
c- Has three stages in which the convalesce stage is the most contagious.

d- Humans and birds are the only reservoirs for the bacteria.

45- It is recommended you use the same type of vaccine throughout a series of vaccinations except when:

a- Patient is allergic to one of the vaccine components.
b- It is not known which vaccine type was used to start the series.
c- It is recommended that an oral vaccine be used for the booster shots
d- Both a and b together.

46- If a series for polio virus vaccinations was started with OPV it should be completed with IPV because:

a- Polio is still endemic in other parts of the world.
b- IPV contains all the three polio serotypes while OPV only contains 2.
c- There is always a risk of developing paralytic polio from OPV but not with IPV.
d- Both a and c together.

47- The recommended schedule for polio vaccination IPV are:

a- At 2, 4, 6-8 months and a fourth dose administered between 4-6 years with a minimum interval of 4 weeks between the 2nd, 3rd and fourth doses for an accelerated schedule.
b- At 2, 4, 6 and between 12-18 months with booster doses every five to ten years thereafter.
c- Only one dose of IPV is required for complete lifelong immunity.
d- None of the above.

48- The difference between DTaP and Tdap vaccines is:

a- Tdap is approved for children up to the age 7 while DTap is approved for adolescents and adults.
b- Tdap contains lesser amount of diphtheria toxoid and acellular pertussis antigen than DTaP
c- Tdap contains whole inactivated pertussis bacterium while DTaP contains accellular Pertussis toxin.
d- Both a and b together.

49- With the eradication of the polio virus from North America since the nineties. Should we still vaccinate against the polio virus?

a- Yes, polio is still endemic in other parts of the world.
b- No, the risk of developing paralytic polio from the vaccine is much higher than the risk of contracting wildtype polio.
c- Yes, but we should only vaccinate those traveling to countries where the virus is endemic.
d- Both a and c together.

50- A 35-year old patient presents to the emergency room with a rusty nail sticking from his foot. You would:

a- Immediately start him on antibiotics most likely erythromycin to prevent any chance of developing tetanus disease.
b- Administer a vaccine containing only the tetanus toxoid.
c- Administer a combination vaccine containing both the tetanus and diphtheria toxoids such as, Td, or Tdap
d- Both a and c together.