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#### Microbiology Self-Quiz (MCQs) with explanation

#### 1.

The latest and most effective therapy for AIDS patients includes azidothymidine (AZT), dideoxyinosine (DDI), and saquinavir or similar agents. Use of these three drugs would inhibit which of the following viral processes?

- A. RNase, DNase
- B. gp120 formation
- C. p24 antibody expression
- D. All membrane synthesis
- E. Reverse transcriptase, protease

# 2.

A tube of monkey kidney cells is inoculated with nasopharyngeal secretions. During the next 7 days, no cytopathic effects (CPEs) are observed. On the eighth day, the tissue culture is infected accidentally with a picornavirus; nevertheless, the culture does not develop CPEs. Which of the following is the most likely explanation of this phenomenon?

- A. The nasopharyngeal secretions contained hemagglutinins
- B. The nasopharyngeal secretions contained rubella virus
- C. Picornavirus does not produce CPEs
- D. Picornavirus does not replicate in monkey kidney cells
- E. Monkey kidney cells are resistant to CPEs

# 3.

Which of the following is the most sensitive test for the diagnosis of herpes simplex (HSV) meningitis in a newborn infant?

- A. HSV IgG antibody
- B. HSV polymerase chain reaction (PCR)
- C. HSV culture
- D. Tzanck smear
- E. Cerebrospinal fluid (CSF) protein analysis

**4.** One of the most common sexually transmitted diseases that may lead to cervical carcinoma is caused by which of the following viruses?

- A. Cytomegalovirus
- B. Papillomavirus
- C. Epstein-Barr virus
- D. Herpes simplex virus
- E. Adenovirus

Meningitis is characterized by the acute onset of fever and stiff neck. Aseptic meningitis may be caused by a variety of microbial agents. During the initial 24 h of the course of aseptic meningitis, an affected person's cerebrospinal fluid is characterized by which of the following?

- A. Decreased protein content
- B. Elevated glucose concentration
- C. Lymphocytosis
- D. Polymorphonuclear leukocytosis
- E. Eosinophilia

# 6.

Kuru is a fatal disease of certain New Guinea natives and is characterized by tremors and ataxia; Creutzfeldt-Jakob disease (CJD) is characterized by both ataxia and dementia. These diseases are thought to be caused by which of the following?

- A. Slow viruses
- B. Cell wall-deficient bacteria
- C. Environmental toxins
- D. Prions
- E. Flagellates

# 7.

An infant, seen in the ER, presents with a fever and persistent cough. Physical examination and a chest x-ray suggest pneumonia. Which of the following is most likely the cause of this infection?

- A. Rotavirus
- B. Adenovirus
- C. Coxsackievirus
- D. Respiratory syncytial virus
- E. Rhinovirus

# 8.

Which one of the following viruses may be human tumor virus?

- A. Epstein-Barr virus (EBV)
- B. HIV
- C. Papillomavirus
- D. Varicella-zoster virus (VZV)
- E. Herpes simplex virus, type 2 (HSV)

There is considerable overlap of signs and symptoms seen in congenital and perinatal infections. In a neonate with "classic" symptoms of congenital cytomegalovirus (CMV) infection, which one of the following tests would be most useful in establishing a diagnosis?

- A. CMV IgG titer on neonate's serum at birth
- B. CMV IgG titer on mother's serum at birth of infant
- C. CMV IgM titer on neonate's serum at birth and at 1 month of age
- D. Total IgM on neonate's serum at birth
- E. Culture of mother's urine

# 10.

Interferon, a protein that inhibits viral replication, is produced by cells in tissue culture when the cells are stimulated with which of the following?

- A. Botulinum toxin
- B. Synthetic polypeptides
- C. Viruses
- D. Chlamydiae
- E. Gram-positive bacteria

# 11.

Which one of the following viruses would be most likely to establish a latent infection?

- A. Adenovirus
- B. Measles virus
- C. Influenza virus
- D. Parvovirus
- E. Coxsackievirus group B

# 12.

Chicken pox is a common disease of childhood. It is caused by which of the following viruses?

- A. Cytomegalovirus
- B. Rotavirus
- C. Varicella-zoster virus

D. Adenovirus

E. Papillomavirus

13.

Human warts are not only cosmetically unsightly but may lead to cancer of the cervix. They are caused by which one of the following viruses?

- A. Cytomegalovirus
- B. Rotavirus
- C. Varicella-zoster virus
- D. Adenovirus
- E. Papillomavirus

#### 14.

A child has mononucleosis-like symptoms yet the test for mononucleosis and the EBV titers are negative. Which of the following is one cause of heterophile-negative mononucleosis?

- A. Cytomegalovirus
- B. Herpes simplex virus
- C. Varicella-zoster virus
- D. Adenovirus
- E. Coxsackievirus

#### 15.

Malaise and fatigue with increased "atypical" lymphocytes and a reactive heterophil antibody test is most commonly caused by which of the following?

- A. Toxoplasma
- B. Borrelia burgdorferi
- C. Epstein-Barr virus
- D. Parvovirus
- E. Rubella virus

#### 16.

Which of the following viruses causes progressive multifocal leukoencephalopathy (PML), a disease causing demyelination in the central nervous system?

- A. Human papillomavirus
- B. West Nile virus
- C. Tick-borne encephalitis virus
- D. Polyomavirus
- E. SSPE

Which of the following is the leading cause of bronchiolitis and community-acquired pneumonia in infants?

- A. Measles virus
- B. Influenza virus
- C. Respiratory syncytial virus
- D. Parainfluenza virus
- E. Adenovirus

#### 18.

A patient with a peptic ulcer was admitted to the hospital and a gastric biopsy was performed. The tissue was cultured on chocolate agar incubated in a microaerophilic environment at 37°C for 5 to 7 days. At 5 days of incubation, colonies appeared on the plate and were curved, Gram-negative rods, oxidase-positive. Which of the following is the most likely identity of this organism?

- A. Campylobacter jejuni
- B. Vibrio parahaemolyticus
- C. Haemophilus influenzae
- D. Helicobacter pylori
- E. Campylobacter fetus

#### 19.

At a church supper in Nova Scotia, the following meal was served: baked beans, ham, coleslaw, eclairs, and coffee. Of the 30 people who attended, 4 senior citizens became ill in 3 days; 1 eventually died. Two weeks after attending the church supper, a 19-year-old girl gave birth to a baby who rapidly became ill with meningitis and died in 5 days. Epidemiologic investigation revealed the following percentages of people who consumed the various food items: baked beans, 30%; ham, 80%; coleslaw, 60%; eclairs, 100%; and coffee, 90%. Microbiologic analysis revealed no growth in the baked beans, ham, or coffee; many Gram-positive beta-hemolytic, short, rod-shaped bacteria in the coleslaw; and rare Gram-positive cocci in the eclairs. Which of the following is the most likely cause of this outbreak?

- A. Staphylococcus aureus
- B. Listeria
- C. Clostridium perfringens
- D. Clostridium botulinum
- E. Nonmicrobiologic

#### 20.

Group B streptococcus sepsis in an infant is preventable. Which one of the following procedures is most likely to reduce the incidence of group B streptococcal disease?

- A. Intrapartum antibiotic treatment
- B. Use of a polysaccharide vaccine
- C. Screening of pregnant females in the last trimester
- D. Identification of possible high-risk births
- E. Screening of pregnant females at the first office visit, usually during the first trimester

There has been much speculation on the pathogenesis of group B streptococcal disease in the neonate. Which of the following is the most likely pathogenic mechanisms?

## A. Complement C5a, a potent chemoattractant, activates PMNs

- B. The streptococci are resistant to penicillin
- C. The alternative complement pathway is activated

D. In the absence of specific antibody, opsonization, phagocyte recognition, and killing do not proceed normally

## 22.

A man who has a penile chancre appears in a hospital's emergency service. The VDRL test is negative. Which of the following is the most appropriate course of action?

- A. Send the patient home untreated
- B. Repeat the VDRL test in 10 days
- C. Perform dark-field microscopy for treponemes
- D. Swab the chancre and culture on Thayer-Martin agar
- E. Perform a Gram stain on the chancre fluid

# 23.

In people who have sickle cell anemia, osteomyelitis usually is associated with which of the following organisms?

- A. Micrococcus
- B. Escherichia
- C. Pseudomonas
- D. Salmonella
- E. Streptococcus

# 24.

A hyperemic edema of the larynx and epiglottis that rapidly leads to respiratory obstruction in young children is most likely to be caused by which of the following?

A. K. pneumoniae

- B. M. pneumoniae
- C. Neisseria meningitidis
- D. H. influenzae
- E. H. hemolyticus

A 70-year-old female patient was readmitted to a local hospital with fever and chills following cardiac surgery at a major teaching institution. Blood cultures were taken and a Gram-positive coccus grew from the blood cultures within 24 hours. Initial tests indicated that this isolate was resistant to penicillin. Which of the following is the treatment of choice for the isolate?

- A. Gentamicin
- B. Gentamicin and ampicillin
- C. Ciprofloxacin
- D. Rifampin
- E. No available treatment

# 26.

A 2-year-old infant is brought to the emergency room with hemolytic uremic syndrome and thrombocytopenia. Which one of the following bacteria would most likely be isolated from a stool specimen?

- A. Shigella
- B. Salmonella
- C. Aeromonas
- D. E. coli 0157/H7
- E. Enterobacter

# 27.

Which of the following is the most effective noninvasive test for the diagnosis of Helicobacter-associated gastric ulcers?

- A. Detection of H. pylori antigen in stool
- B. Growth of H. pylori from a stomach biopsy
- C. Growth of H. pylori in the stool
- D. IgM antibodies to H. pylori
- E. Culture of stomach contents for H. pylori

# 28.

A patient with symptoms of urinary tract infection had a culture taken, which grew 5 × 103 E. coli. The laboratory reported it as "insignificant." Which of the following is the most clinically appropriate action?

- A. Do no further clinical workup
- B. Suggest to the laboratory that low colony counts may reflect infection
- C. Determine if fluorescent microscopy is available for the diagnosis of actinomycosis
- D. Consider vancomycin as an alternative drug
- E. Suggest a repeat antibiotic susceptibility test

Which of the following is the antibiotic of choice for Lyme disease?

- A. Penicillin
- B. Ampicillin
- C. Erythromycin
- D. Vancomycin
- E. Ceftriaxone

#### 30.

N. gonorrhoeae is a fastidious pathogen and found in sites often contaminated with normal flora. Which of the following is the best medium for isolation?

- A. Sheep blood agar
- B. Löffler's medium
- C. Thayer-Martin agar
- D. Thiosulfate citrate bile salts sucrose medium
- E. Löwenstein-Jensen medium

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