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Nester's
MICROBIOLOGY
A Human Perspective
Eighth Edition

TEST BANK

Chapter 01 Humans and the Microbial World

Multiple Choice Questions

1. The scientist usually considered the first to see microorganisms, which he called "animalcules", was

A.

Redi.

B.

van Leeuwenhoek.

C.

Pasteur.

D.

Tyndall.

Bloom's Level: 1. Remember

Learning Outcome: 01.01

Section: 01.01

Topic: History of Microbiology

2. The word "animalcule" was coined by

- A. Pasteur.
- B. van Leeuwenhoek.**
- C. Redi.
- D. Tyndall.

Bloom's Level: 1. Remember
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

3.

The idea of spontaneous Generation postulated that

- A. organisms could evolve into the next generation of organisms.
- B. organisms could spontaneously combust.
- C. organisms could spontaneously arise from other living organisms.
- D. living organisms could spontaneously arise from non-living material.**

Bloom's Level: 2. Understand
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

4. Which of these scientist(s) was/were involved in, among other things, investigating the idea of spontaneous generation?

- A. Redi
- B. van Leeuwenhoek
- C. Pasteur
- D. Escherich
- E. Redi AND Pasteur**

Bloom's Level: 1. Remember
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

5. The work of Tyndall and Cohn

A. supported the idea of spontaneous generation.

B. was used to explain why others investigating spontaneous generation had obtained results that were opposite of those obtained by Pasteur.

C. showed that microbes caused disease.

D. allowed scientists to see microorganisms.

Bloom's Level: 2. Understand
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

6.

The structures present in the hay infusions used in experiments on spontaneous generation that made them difficult to sterilize are

A. chlorophyll.

B. toxins.

C. organelles.

D. endospores.

Bloom's Level: 1. Remember
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

7. The opposite results obtained by scientists apparently doing the same experiments in investigating spontaneous generation

A. shows the importance of repeating experiments.

B. shows the importance of exactly duplicating experimental conditions.

C. led to further experiments that ultimately furthered knowledge.

D. All of the choices are correct.

Bloom's Level: 2. Understand
Learning Outcome: 01.01
Section: 01.01
Topic: History of Microbiology

Chapter 01 - Humans and the Microbial World

8.

If while investigating spontaneous generation, Pasteur had his laboratory located in a stable

- A. the results would, most likely, have supported the idea of spontaneous generation.
- B. the results would, most likely, have not supported the idea of spontaneous generation.
- C. this would have had no effect on his results.
- D. this would have shown his love of horses.

Bloom's Level: 3. Apply

Learning Outcome: 01.01

Section: 01.01

Topic: History of Microbiology

9. Cellulose is a major component of plants and is only directly digested by

- A. herbivores.
- B. carnivores.
- C. termites.
- D. microorganisms.

Bloom's Level: 2. Understand

Learning Outcome: 01.02

Section: 01.02

Topic: Environmental Microbiology

10. Plants are dependent on microorganisms for

- A. providing oxygen.
- B. providing water.
- C. changing atmospheric nitrogen to a usable form.
- D. providing carbohydrates.

Bloom's Level: 2. Understand

Learning Outcome: 01.02

Section: 01.02

Topic: Environmental Microbiology

11. Microorganisms are involved in

- A. causing disease.
- B. curing/treating disease.
- C. preparing food.
- D. cleaning up pollutants.
- E.** All of the choices are correct.

Bloom's Level: 2. Understand
Learning Outcome: 01.03
Section: 01.02
Topic: Applied and Industrial Microbiology

12. Bacteria have been used to help produce or modify food products

- A.** for several thousand years.
- B.

since the Middle Ages.

- C. since the late 1800s.
- D. since the 1950s.

Bloom's Level: 1. Remember
Learning Outcome: 01.03
Section: 01.02
Topic: Applied and Industrial Microbiology

13. Microorganisms are involved in

- A. production of medicinal products.
- B. transforming atmospheric nitrogen to a form useful to plants.
- C. food production.
- D. pollution cleanup.
- E.** All of the choices are correct.

Bloom's Level: 2. Understand
Learning Outcome: 01.03
Section: 01.02
Topic: Applied and Industrial Microbiology

14. Bioremediation refers to
- A. rehabilitating wayward bacteria.
 - B. using bacteria to clean up pollutants.**
 - C. vaccine development.
 - D. monitoring newly discovered disease organisms.

Bloom's Level: 1. Remember

Learning Outcome: 01.03

Section: 01.02

Topic: Applied and Industrial Microbiology

15. The Golden Age of Medical Microbiology
- A. occurred during the late 1800s to early 1900s.
 - B. started in the 1990s with the advent of genetic engineering.
 - C. is a time when the knowledge of and techniques to work with bacteria blossomed.
 - D. was when people realized that diseases could be caused by invisible agents.
 - E. occurred during the late 1800s to early 1900s, is a time when the knowledge of and techniques to work with bacteria blossomed AND was when people realized that diseases could be caused by invisible agents.**

Bloom's Level: 1. Remember

Learning Outcome: 01.04

Section: 01.02

Topic: History of Microbiology

Chapter 01 - Humans and the Microbial World

16.

Newly emerging or reemerging diseases

- A. may be due to changing lifestyles.
- B.

are exemplified by Lyme disease and toxic shock syndrome.

- C. may reflect a breakdown in sanitation/social order.
- D. may be related to global cooling.
- E.**

may be due to changing lifestyles, are exemplified by Lyme disease and toxic shock syndrome, AND may reflect a breakdown in sanitation/social order.

Bloom's Level: 2. Understand
Learning Outcome: 01.04
Section: 01.02
Topic: Infection and Disease

17.

Lyme disease is an example of a disease

- A.** that is due to a greater degree of interaction between humans and tick-carrying animals.
- B. that is due to a decline in vaccinations.
- C. that is due to a mutation in the human genome.
- D. that is due to climate change leading to a greater mosquito population.

Bloom's Level: 2. Understand
Learning Outcome: 01.04
Section: 01.02
Topic: Infection and Disease

18. The outbreak of measles within the last few years was due to

- A. mutation of the virus.
- B. change in the environment.
- C. a decline in vaccination of children in the previous years.
- D. increase in sensitivity of detection techniques.

Bloom's Level: 2. Understand

Learning Outcome: 01.04

Section: 01.02

Topic: Infection and Disease

19. Smallpox

- A. has been eliminated as a naturally occurring infection in human beings.
- B.

still occasionally occurs in third world countries.

- C. probably only had a human reservoir.
- D. was dealt with by vaccination.
- E. has been eliminated as a naturally occurring infection in human beings, AND was dealt with by vaccination.

Bloom's Level: 2. Understand

Learning Outcome: 01.04

Section: 01.02

Topic: History of Microbiology

20. Smallpox

- A.

aided European domination of new world nations.

- B. has not occurred naturally anywhere in the world since 1977.
- C. has potential as a weapon of bioterrorism.
- D. has killed millions of people.
- E. All of the choices are correct.

Bloom's Level: 1. Remember

Learning Outcome: 01.04

Section: 01.02

Topic: History of Microbiology

21. Diseases such as ulcers and cardiovascular disease

- A. have been shown to be, or may be due to, a bacterial infection.
- B. are solely due to lifestyle.
- C. are solely due to genetics.
- D. are due to new mutations in bacteria.

Bloom's Level: 2. Understand

Learning Outcome: 01.04

Section: 01.02

Topic: Infection and Disease

22. Bacteria are useful to study because

- A. they produce protein in a similar manner to more complex organisms.
- B. they replicate DNA in a similar manner to more complex organisms.
- C. they produce energy in a similar manner to more complex organisms.
- D. they are grown quickly, easily, and cheaply.
- E. All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 01.05

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

23. Bacteria

- A. are not found on our bodies.
- B. are only found on small select parts of our bodies.
- C.

provide protection to us from disease by covering our bodies, crowding out "bad" invading bacteria.

- D. always cause disease when growing on our bodies.

Bloom's Level: 2. Understand

Learning Outcome: 01.04

Section: 01.02

Topic: History of Microbiology

24. Bacteria are present on the body
- A. only during disease-causing infections.
 - B. constantly.**
 - C. only in certain restricted areas.
 - D. never.

Bloom's Level: 1. Remember
Learning Outcome: 01.04
Section: 01.02
Topic: Infection and Disease

25. Bacteria are good models to use because they
- A. are large in size.
 - B. share many biochemical/physiological properties with more complicated organisms.**
 - C. can be assembled into multicellular organisms.
 - D. have complicated growth requirements.

Bloom's Level: 2. Understand
Learning Outcome: 01.05
Section: 01.03
Topic: Microbial Growth and Nutrition

26.

Which is usually true of bacteria?

- A. They are found as rods, spheres, or spirals.
- B. They reproduce by binary fission.
- C. They contain rigid cell walls made of peptidoglycan.
- D. They are found as single cells.
- E. All of the choices are correct.**

Bloom's Level: 1. Remember
Learning Outcome: 01.06
Section: 01.03
Topic: Prokaryotes

27.

Which is usually true of archaea?

- A. They are found as rods, spheres, or spirals.
- B. They reproduce by binary fission.
- C. They contain rigid cell walls.
- D. They are found as single cells.
- E.** All of the choices are correct.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

28.

Which is not usually true of archaea?

- A. They are found as rods, spheres, or spirals.
- B. They reproduce by binary fission.
- C. They contain rigid cell walls.
- D. They are found as single cells.
- E.** They contain peptidoglycan as part of their cell walls.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

Chapter 01 - Humans and the Microbial World

29.

Some archaea are commonly found in

- A. meteors.
- B. boiling hot springs.
- C. the Great Salt Lake.
- D. your refrigerator.
- E.** boiling hot springs AND the Great Salt Lake.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

30.

The cell types that lack a membrane-bound nucleus are found in the

- A. eukaryotes.
- B. prokaryotes.
- C. archaea.
- D. protista.
- E.** prokaryotes AND archaea.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

31. The prokaryotic cell scheme is found in

A.

bacteria.

B.

archaea.

C.

eucarya.

D. All of the choices are correct.

E.

bacteria AND archaea.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

32. Eucarya

A. consist of only multicellular organisms.

B.

have a more complex internal structure than archaea or bacteria.

C.

have a simpler internal structure than archaea or bacteria.

D. have a membrane around the DNA.

E.

have a more complex internal structure than archaea or bacteria AND have a membrane around the DNA.

Bloom's Level: 2. Understand

Learning Outcome: 01.06

Section: 01.03

Topic: Eukaryotes

33. Which group(s) below contain single-celled and multicellular organisms?

A.

Algae

B.

Fungi

C.

Protozoa

D. All of the choices are correct.

E.

Algae AND Fungi

Bloom's Level: 2. Understand

Learning Outcome: 01.07

Section: 01.03

Topic: Eukaryotes

34. Organisms

A. may be classified in four domains.

B. may be classified in three domains.

C. probably do not have a common ancestor.

D. have never shared genes between domains.

E.

may be classified in three domains, probably do not have a common ancestor, AND have never shared genes between domains.

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

35. The system by which organisms are named is referred to as
- A. systematics.
 - B. naming.
 - C. nomenclature.
 - D. cladistics.

Bloom's Level: 1. Remember

Learning Outcome: 01.08

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

36. The scientific name of an organism includes its
- A. family and genus.
 - B. first name and last name.
 - C. genus and species.
 - D. domain.
 - E. genus and species AND domain.

Bloom's Level: 1. Remember

Learning Outcome: 01.08

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

37. Which is/are the correct form(s)?
- A. Staphylococcus aureus
 - B. *Staphylococcus aureus*
 - C. *staphylococcus aureus*
 - D. *S. aureus*
 - E. *Staphylococcus aureus* AND *S. aureus*

Bloom's Level: 3. Apply

Learning Outcome: 01.08

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

38. Which of these may pertain to the term strain?

A. *E. coli* 0157:H7

B. *E. coli*

C.

Minor variation of a species

D.

Major variation of a species

E. *E. coli* 0157:H7 AND minor variation of a species

Bloom's Level: 2. Understand

Learning Outcome: 01.08

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

39. Viroids

A. are naked (lacking a protein shell) pieces of RNA.

B. are naked (lacking a protein shell) pieces of DNA.

C. are known to cause neurodegenerative diseases in animals.

D. are composed of protein encasing DNA.

E. are known to cause neurodegenerative diseases in animals AND are composed of protein encasing DNA.

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

40. Outside a cell, viruses are

- A. running a small number of biochemical reactions.
- B. synthesizing proteins necessary for entry into the host.
- C. inactive.**
- D. constructing a cell membrane known as an envelope.
- E. running a small number of biochemical reactions AND synthesizing proteins necessary for entry into the host.

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

41. Viruses may only be grown

- A. in sterile, cell-free chemical growth media.
- B. in living cells.**
- C. at body temperature.
- D. in darkness.

Bloom's Level: 3. Apply

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

42. Viruses are in the group

A.

viridaceae.

B.

eukarya.

C.

archaea.

D.

bacteria.

E. None of the choices is correct.

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

43. Viruses

A. are obligate intracellular parasites.

B. are single-celled organisms.

C. consist of only proteins.

D.

are in the Domain *Archaea*.

E. are obligate intracellular parasites AND are single-celled organisms.

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

44. Viruses are often referred to as

- A. infectious agents.
- B. eubacteria.
- C. archaebacteria.
- D. cellular agents.

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

45.

Viruses, viroids, and prions all

- A. operate intracellularly.
- B. may be considered acellular agents of disease.
- C. contain DNA.
- D. infect only animals.
- E. operate intracellularly AND may be considered acellular agents of disease.

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

46. Both viruses and viroids are

- A. capable of independent reproduction.
- B. obligate intracellular parasites.
- C. interdependent with one another for reproduction.
- D. larger than most bacteria in size.

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

47. Prions

- A. are only composed of RNA.
- B. are only composed of DNA.
- C. are only composed of protein.
- D. cause diseases in plants.
- E. are only composed of RNA AND cause diseases in plants.

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

48. The smallest organism is probably determined by

- A. the number of molecules necessary for its growth and replication.
- B. the size of the molecules necessary for its growth and replication.
- C. its membrane.
- D. its volume.
- E. the number of molecules necessary for its growth and replication AND the size of the molecules necessary for its growth and replication.

Bloom's Level: 3. Apply

Learning Outcome: 01.10

Section: 01.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

49. A new organism was found that was unicellular and 1 cm long. The "large" size of this organism alone would

- A. mean that it could not be a bacterium.
- B. mean that it had to be a protista.
- C. mean little.
- D.

mean that it had to be in the domain eukarya.

Bloom's Level: 2. Understand

Learning Outcome: 01.10

Section: 01.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

50. Although it is said that the twentieth century was the Age of Physics, it is predicted that the twenty-first century will be the age of

- A. chemistry.
- B. computers.
- C. microbial biodiversity.**
- D. mathematics.

Bloom's Level: 2. Understand

Learning Outcome: 01.05

Section: 01.03

Topic: Microbial World

True / False Questions

51. Spontaneous generation referred to the idea that organisms came from other organisms.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.01

Section: 01.01

Topic: History of Microbiology

52. The human body only contains bacteria during illness.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 01.04

Section: 01.02

Topic: Infection and Disease

53.

Bacteria and eukarya both contain membrane-bound organelles.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Eukaryotes

54. The scientific name of an organism indicates its domain.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.08

Section: 01.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

55. Viroids are naked (lacking a protein shell) pieces of DNA that infect plants.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

56.

Viruses simultaneously contain DNA, RNA, and protein.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

57. Viruses, viroids, and prions are obligate intracellular agents.

TRUE

Bloom's Level: 2. Understand

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

58. Viruses and bacteria are both based on the unit of a cell.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.09

Section: 01.04

Topic: Viruses

59. The size of an organism determines its domain.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 01.10

Section: 01.05

Topic: Microbial World

60.

Archaea are very similar to bacteria and have rigid cell walls made of peptidoglycan.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 01.06

Section: 01.03

Topic: Prokaryotes

61.

Thiomargarita namibiensis could not be a eukaryote because it is only 1 mm in width.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 01.10

Section: 01.05

Topic: Prokaryotes

Multiple Choice Questions

62.

HIV/AIDS can be categorized as a new or emerging infectious disease. By putting it into this category, we are effectively saying that

- A.** this infection hasn't been observed in the human population prior to recent (approximately 50 years or sooner) outbreaks.
- B. this disease has been in susceptible populations for centuries, but has only recently achieved infection levels that became detectable.
- C. the infectious agent is still evolving and changing, unlike with older, more established diseases such as plague or polio.
- D. the disease has always been in susceptible populations and causing disease, but we lacked the technology to detect it.

Bloom's Level: 3. Apply

Learning Outcome: 01.04

Section: 01.02

Topic: Infection and Disease

63.

An illness outbreak occurs in New York City birds in the late 1990s. After a lengthy scientific investigation, the Centers for Disease Control (CDC) determine that the agent causing the birds to die is the West Nile virus. Outbreaks of this illness have been observed in several other countries in Asia and the Middle East across the last 50 years, but not in the United States. With this information, what would be the best categorization of this infectious agent/disease

A.

This is clearly a reemerging infection. It's been around for a long time, and it is reappearing in a susceptible population again.

B.

This is clearly a nosocomial infection. It's transmitted from animals to human beings in urban environments.

C. This is clearly an emerging infection. It hasn't been around that long, and it has made a jump across continents into a new susceptible population.

D.

This is clearly not a concern to human beings--maybe it's emerging in animals, maybe it's reemerging, maybe it's nosomial. But who cares? It's only in birds.

Bloom's Level: 4. Analyze
Learning Outcome: 01.04
Section: 01.02
Topic: Infection and Disease

64. Why are we concerned at all with monitoring emerging/reemerging diseases?

A. These represent growing threats to human health that will require new scientific research and resources to effectively combat.

B.

Because globalization (greater trade and travel between countries) leads to more chances for spread of illnesses into new areas and populations. Monitoring these illnesses will help us to protect people.

C.

Because the speed of travel has increased greatly. With increased speed of travel, it is far more likely that a serious pathogenic threat from one area of the world can spread rapidly across the globe in a very fast manner. We need to monitor the occurrence of these illnesses to try to protect populations.

D. All of the above.

Bloom's Level: 4. Analyze
Learning Outcome: 01.04
Section: 01.02
Topic: Infection and Disease

65.

A microbiologist obtained two pure isolated biological samples: one of a virus, and one of a viroid. The labels came off during a move from one lab to the next, however. The scientist felt she could distinguish between the two samples by analyzing for the presence of a single type of molecule. What type of molecule would she be looking for to differentiate between the two?

A. DNA

B.

Protein

C.

Lipids

D. RNA

Bloom's Level: 3. Apply
Learning Outcome: 01.09
Section: 01.04
Topic: Viruses

Chapter 01 - Humans and the Microbial World

66.

Within a lab, a scientist has two samples-the first is a prion sample, while the second is a viroid sample. But those pesky labels have come off of the flasks! She wants to run a simple analysis to determine which one is which. What type of molecule would she look for to determine which one is which?

A.

Lipids

B. DNA

C.

Protein

D.

Polysaccharides

Bloom's Level: 3. Apply
Learning Outcome: 01.09
Section: 01.04
Topic: Viruses

67.

A scientist discovers a new species near coral reefs in Australia. On basic microscopic examination and after conducting a few simple experiments, he finds that this single-celled species is photosynthetic (using sunlight for energy), has a rigid cell wall structure with no peptidoglycan, uses a flagellum for motion, and contains a variety of internal structures that are bound by plasma membranes. Given this information, this new species is most likely a _____ cell in the _____ subcategory.

A. bacterial; eubacterial

B. eukaryotic; fungus

C. archaebacterial; fungus

D. eukaryotic; algae

E. eukaryotic; protozoan

Bloom's Level: 5. Evaluate
Learning Outcome: 01.07
Section: 01.03
Topic: Eukaryotes

Chapter 01 - Humans and the Microbial World

68.

Scientists recently cloned Louis Pasteur and put him back to work in a modern lab. He promptly developed a gel that breaks down proteins. Since he hasn't been around for some time, he's unsure what the best application for his invention might be. Help him out. What pathogenic item in this gel would be most effective and safe at eliminating?

A.

Viroids on the surface of agricultural plant tissues

B.

Prions inside the central nervous system of cows

C.

Viruses on the surface of the skin

D.

Bacteria in the intestines of human beings

E.

The fungus that causes athlete's foot between people's toes

Bloom's Level: 3. Apply
Learning Outcome: 01.09
Section: 01.04
Topic: Infection and Disease
Topic: Viruses

Chapter 02 The Molecules of Life

Multiple Choice Questions

1. In addition to investigations with bacteria that led to him being considered the Father of Microbiology, Pasteur also
- A. found that some molecules can exist as stereoisomers.
 - B. created aspartame.
 - C. separated organic acids using a microscope.
 - D. discovered polarized light.
 - E. found that some molecules can exist as stereoisomers AND separated organic acids using a microscope.**

*Bloom's Level: 1. Remember
Learning Outcome: 02.01
Section: 02.01
Topic: Chemistry*

2. The negatively charged component of the atom is the
- A. proton.
 - B. nucleus.
 - C. neutron.
 - D. electron.**

*Bloom's Level: 1. Remember
Learning Outcome: 02.01
Section: 02.01
Topic: Chemistry*

3. The part of the atom that is most involved in chemical reactivity is the

- A. proton.
- B. neutron.
- C. electron.
- D. nucleus.

Bloom's Level: 2. Understand

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

4. Electrons

- A. are found in areas outside the nucleus known as orbitals.
- B. may gain or lose energy.
- C. may move from one orbital to another.
- D. are located farthest from the nucleus and have the least energy.
- E. are found in areas outside the nucleus known as orbitals, may gain or lose energy, and may move from one orbital to another.

Bloom's Level: 1. Remember

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

Check All That Apply Questions

Chapter 02 - The Molecules of Life

5.

The atomic number for an atom of a specific element is equal to (Check all that apply)

☒ X

the number of electrons in a single atom of that element.

☐ the number of electrons plus neutrons in a single atom of that element.

☒ X the number of protons in a single atom of that element.

☐ the number of neutrons and protons in a single atom of that element.

Bloom's Level: 1. Remember

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

Multiple Choice Questions

6. Sharing of electrons between 2 atoms forms a(n)

A. hydrogen bond.

B. ionic bond.

C. covalent bond.

D. strong bond.

E. covalent bond AND strong bond.

Bloom's Level: 2. Understand

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

7. If electrons are gained or lost in the formation of a bond, the bond is termed

- A. covalent.
- B. hydrogen.
- C. ionic.
- D. nonpolar.

Bloom's Level: 2. Understand

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

8. Charged atoms are termed

- A. ions.
- B. neutrons.
- C. molecules.
- D. polymers.

Bloom's Level: 1. Remember

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

9. Water

- A. is a polar molecule.
- B. is referred to as a universal solvent.
- C. makes up over 70% (by wt.) of an organism.
- D. is often a product or reactant in chemical reactions.
- E. All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 02.05

Section: 02.03

Topic: Chemistry

10. pH

- A. is a measure of the hydrogen ion concentration.
- B. utilizes a scale from 5 to 8.
- C. is a linear (not logarithmic) scale.
- D.

is an abbreviation for "power of helium."

E.

is a measure of the hydrogen ion concentration, utilizes a scale from 5 to 8, AND is a linear (not logarithmic) scale.

Bloom's Level: 2. Understand

Learning Outcome: 02.06

Section: 02.03

Topic: Chemistry

11. The subunits (building blocks) of proteins are

- A. nucleotides.
- B. phospholipids.
- C. amino acids.
- D. carbohydrates.

Bloom's Level: 1. Remember

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

12. If the side chains of amino acids contain carboxyl (-COOH) groups, they

- A. contribute a positive charge to the amino acid at pH 10.
- B. contribute a negative charge to the amino acid at pH 10.
- C. have no effect on the charge of the amino acid at pH 10.
- D. are considered acidic amino acids.
- E. contribute a negative charge to the amino acid at pH 10 AND are considered acidic amino acids.

Bloom's Level: 3. Apply

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

13. Amino acids that contain many methyl (-CH₃) groups

A. are considered hydrophilic.

B.

are non-polar.

C. carry a positive charge.

D. carry a negative charge.

E. are considered hydrophilic AND carry a positive charge.

Bloom's Level: 3. Apply

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

14. D-amino acids are associated with

A. radioactive isotopes.

B. human proteins.

C. plant proteins.

D. bacterial cell walls.

Bloom's Level: 1. Remember

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

15. The most important feature of a protein is its

A. secondary structure.

B. side group.

C. shape.

D. electric charge.

Bloom's Level: 2. Understand

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

16. The helices and sheets of amino acids form a protein's

- A. primary structure.
- B. secondary structure.**
- C. tertiary structure.
- D. quaternary structure.

Bloom's Level: 1. Remember

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

17. Acidic or basic amino acids are

- A. readily soluble in water.
- B. readily soluble in lipids.
- C. able to form ions.
- D. considered hydrophilic.
- E.**

readily soluble in water, able to form ions, AND considered hydrophilic.

Bloom's Level: 2. Understand

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

18. The N terminal in a protein

- A. is the end characterized by a free carboxyl group.
- B. is the end characterized by a free amino group.**
- C. is typically found in the middle of a protein.
- D. refers to that area of a protein that is bound to another protein.

Bloom's Level: 1. Remember

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

19. Protein denaturation can
- A. occur due to certain chemicals.
 - B. occur due to pH changes.
 - C. occur due to high temperature.
 - D. cause the protein to no longer function.
 - E.** All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

20. Which is true of carbohydrates?
- A. They may be part of the structure of bacteria.
 - B. They may serve as a source of food.
 - C.

They contain carbon, hydrogen, and oxygen in a 1:2:1 ratio.

- D. They may be bonded to proteins to form glycoproteins.
- E.** All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 02.12

Section: 02.05

Topic: Chemistry

21. Carbohydrates
- A. form only ring structures.
 - B. form only linear structures.
 - C.** may interconvert between ring and linear structures.
 - D. contain both ring and linear portions within the same molecule.

Bloom's Level: 2. Understand

Learning Outcome: 02.13

Section: 02.05

Topic: Chemistry

22. Structural isomers

- A. contain the same number of atoms/elements, but in different arrangements.
- B. are exemplified by glucose and galactose.
- C. are formed by different arrangements of the -COOH groups.
- D. may be referred to as the -D and -L forms.
- E.** contain the same number of atoms/elements, but in different arrangements AND are exemplified by glucose and galactose.

Bloom's Level: 3. Apply
Learning Outcome: 02.13
Section: 02.05
Topic: Chemistry

23. What type of bonding holds one strand of DNA to the complementary strand of DNA?

A.

Covalent

B.

Hydrogen

C.

Disulfide

D.

Ionic

Bloom's Level: 2. Understand
Learning Outcome: 02.14
Section: 02.06
Topic: Chemistry

24. The sugars found in nucleic acids consist of

A. 3 carbon atoms.

B. 5 carbon atoms.

C. 7 carbon atoms.

D. 9 carbon atoms.

Bloom's Level: 1. Remember

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

25. Which of the following is found in RNA but not in DNA?

A.

Adenine

B.

Ribose

C.

Thymine

D.

Uracil

E.

Ribose AND Uracil

Bloom's Level: 2. Understand

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

26. Which shows the incorrect complementary base pairing?

- A. A:T
- B. G:C
- C. G:T**
- D. A:U
- E.

A:T, G:C, AND A:U

Bloom's Level: 3. Apply
Learning Outcome: 02.14
Section: 02.06
Topic: Chemistry

27. The components of fats are fatty acids and

- A. amino acids.
- B. nucleotides.
- C. phosphate.
- D. glycerol.**
- E. All of the choices are correct.

Bloom's Level: 1. Remember
Learning Outcome: 02.15
Section: 02.07
Topic: Chemistry

28.

In general, when saturated fats are compared to unsaturated fats (assuming the same number of carbon atoms in the molecule),

- A. they have about the same melting temperature.
- B. saturated fats have a lower melting temperature.
- C. unsaturated fats have a lower melting temperature.**
- D. No generalizations can be made since melting temperature is strongly influenced by other factors.

Bloom's Level: 3. Apply
Learning Outcome: 02.15
Section: 02.07
Topic: Chemistry

True / False Questions

29. If you placed the molecule in a vertical orientation, then from top to bottom, the two parallel strands of DNA are both oriented in the same, 5' to 3', direction.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

30. RNA is a long double-stranded helix containing ribose and uracil.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

31. Lipids, like nucleic acids and proteins, are made of strings of similar subunits.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

32. Steroids are simple lipids.

TRUE

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

33.

Water-soluble substances easily pass through the phospholipid bilayer of a cell membrane.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

Multiple Choice Questions

34. The positively charged component of the atom is the

A. electron.

B. neutron.

C. proton.

D. quark.

Bloom's Level: 1. Remember

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

35. The uncharged component of the atom is the

A. electron.

B. proton.

C. neutron.

D. muon.

Bloom's Level: 1. Remember

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

36. Which determines the chemical and physical properties of an atom of an element?

A.

Electron

B.

Neutron

C.

Atomic weight

D.

Atomic number

Bloom's Level: 2. Understand

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

37. The atom, as a whole, is uncharged because

A. the number of protons equals the number of neutrons.

B. the number of electrons equals the number of neutrons.

C. neutrons neutralize the charges.

D. the number of protons equals the number of electrons.

Bloom's Level: 2. Understand

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

38. The atomic weight is equal to

- A. the number of electrons.
- B. the number of electrons plus neutrons.
- C. the number of protons.
- D.** the number of neutrons and protons.

Bloom's Level: 1. Remember

Learning Outcome: 02.01

Section: 02.01

Topic: Chemistry

39. If electrons are shared unequally, this forms a(n)

- A. weak bond.
- B.

non-polar bond.

C. polar bond.

D. ionic bond.

Bloom's Level: 2. Understand

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

40. Atoms that gain electrons are now

- A. positively charged.
- B.** negatively charged.
- C. neutral.
- D. lighter.

Bloom's Level: 2. Understand

Learning Outcome: 02.02

Section: 02.02

Topic: Chemistry

41. Which of these bonds are weak individually but are much stronger as a group?

A.

Covalent

B.

Ionic

C.

Neutron

D.

Hydrogen

E.

Ionic AND Hydrogen

Bloom's Level: 3. Apply

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

42. The most important molecule(s) in the world is(are)

A. water.

B. protein.

C. carbohydrates.

D. nucleic acids.

Bloom's Level: 2. Understand

Learning Outcome: 02.08

Section: 02.03

Topic: Chemistry

43. The energy storage form of ATP

A. contains deoxyribose.

B. contains ribose.

C. contains a pyrimidine base.

D. readily releases energy by breaking the bond between the base and the sugar.

E.

contains deoxyribose, contains a pyrimidine base, AND readily releases energy by breaking the bond between the base and the sugar.

Bloom's Level: 1. Remember

Learning Outcome: 02.07

Section: 02.03

Topic: Chemistry

44. How many different amino acids are there to choose from when assembling a protein?

A. 5

B. 10

C. 20

D. 25

Bloom's Level: 1. Remember

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

45. If the side chains of amino acids contain the ammonium ion, they readily form ions that

A. are described as acidic amino acids.

B. give positive electric charges to the amino acid.

C. are described as basic amino acids.

D. react with lipids to form lipoproteins.

E. give positive electric charges to the amino acid AND are described as basic amino acids.

Bloom's Level: 3. Apply

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

46. L-amino acids occur in proteins and are designated

- A. unnatural.
- B. natural.
- C. rare.
- D. left handed.
- E.** natural AND left handed.

Bloom's Level: 2. Understand

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

47. Amino acids in proteins are linked to one another by peptide bonds between the

- A. methyl group of one amino acid and a side group of another amino acid.
- B. carbon atoms of two adjacent amino acids.
- C.** carboxyl group of one amino acid and the amino group of another.
- D. nitrogen atom and carboxyl ion.

Bloom's Level: 2. Understand

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

48. The primary structure in a protein

- A. refers to the helical folding of a protein.
- B. refers to two or more polypeptides linked to one another.
- C.** refers to the sequence of amino acids.
- D. refers to the initial folding of a protein.

Bloom's Level: 1. Remember

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

49. Side chains are important to proteins because they

- A. help determine protein shape.
- B. help determine the degree of solubility of the protein in water.
- C. are a source of energy for hydration reactions in the cell.
- D.

form the peptide bonds that link amino acids to one another.

E. help determine protein shape AND help determine the degree of solubility of the protein in water.

Bloom's Level: 3. Apply
Learning Outcome: 02.10
Section: 02.04
Topic: Chemistry

50. A protein

- A. assumes any number of equally functional shapes.
- B.** may need help, in the form of chaperones, to assume the correct shape.
- C. consists of a string of hydroxyl acids.
- D. is always polar.
- E. assumes any number of equally functional shapes AND may need help, in the form of chaperones, to assume the correct shape.

Bloom's Level: 2. Understand
Learning Outcome: 02.11
Section: 02.04
Topic: Chemistry

51. Weak bonds are important for the _____ structure of proteins.

- A. primary
- B. secondary
- C. tertiary
- D. quarternary
- E.**

secondary, tertiary, AND quarternary

Bloom's Level: 2. Understand

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

52. Proteins

- A. are involved in almost every important function performed by a cell.
- B. comprise more than 50% of the dry weight of a cell.
- C. are composed of a string of nucleotides.
- D. are characterized by a 1:2:1 ratio of carbon to hydrogen to oxygen.
- E.** are involved in almost every important function performed by a cell AND comprise more than 50% of the dry weight of a cell.

Bloom's Level: 2. Understand

Learning Outcome: 02.09

Section: 02.04

Topic: Chemistry

53. The carbohydrate(s) found in nucleic acids is/are

- A. ribose.
- B. glucose.
- C. galactose.
- D. deoxyribose.
- E.** ribose AND deoxyribose.

Bloom's Level: 1. Remember

Learning Outcome: 02.12

Section: 02.05

Topic: Chemistry

54. The -OH group in a carbohydrate

- A. may be found above or below the plane of the ring.
- B. is involved in the formation of stereoisomers.
- C. is involved when linking monosaccharides together.
- D.** All of the choices are true.

Bloom's Level: 2. Understand

Learning Outcome: 02.13

Section: 02.05

Topic: Chemistry

55. Dehydration reactions are involved in

- A. the formation of polypeptides.
- B. the formation of polysaccharides.
- C. the formation of monosaccharides.
- D. the formation of nucleotides.
- E.** the formation of polypeptides AND the formation of polysaccharides.

Bloom's Level: 2. Understand

Learning Outcome: 02.10

Section: 02.04

Topic: Chemistry

56. Which is true of nucleotides?

- A. They are the building blocks of DNA.
- B. They carry chemical energy in their bonds.
- C. They are part of certain enzymes.
- D. They serve as specific signaling molecules.
- E.** All of the choices are true.

Bloom's Level: 2. Understand

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

57. The purines of DNA are

- A. adenine and guanine.
- B. thymine and adenine.
- C. serine and threonine.
- D. thymine and uracil.
- E. thymine and adenine AND thymine and uracil.

Bloom's Level: 1. Remember

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

58. The end of the nucleic acid chain that grows by adding more nucleotides is always the

- A. 5 prime end.
- B. C terminal.
- C. N terminal.
- D. 3 prime end.

Bloom's Level: 2. Understand

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

59. The characteristic common to all lipids is their

- A. solubility in organic solvents.
- B. hydrophilic nature.
- C. large size.
- D. hydrophobic nature.
- E. solubility in organic solvents AND hydrophobic nature.

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

60.

Which is (are) true of lipids?

- A. They are a major structural element of all cell membranes.
- B. They act as gatekeepers of the cell.
- C. They demark the inside vs. the outside of the cell.
- D. They are a heterogeneous group of molecules.
- E.** All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

True / False Questions

61. As DNA is always double-stranded, RNA is always single-stranded.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 02.14

Section: 02.06

Topic: Chemistry

62. Lipids are polar, hydrophilic molecules.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

63. Simple lipids contain carbon, hydrogen, and oxygen in a 1:2:1 ratio.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

64.

Phospholipids are non-polar molecules.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

65. Unsaturated fats have lower melting points than saturated fats.

TRUE

Bloom's Level: 3. Apply

Learning Outcome: 02.15

Section: 02.07

Topic: Chemistry

Multiple Choice Questions

66.

Microorganisms use hydrogen bonds to attach themselves to the surfaces that they live upon. Many of them lose hold of the surface because of the weak nature of these bonds and end up dying or being washed away. Why don't microbes just use covalent bonds instead?

A.

Covalent bonds are always permanent bonds; the microbes could never get OFF their surface if they used them.

B.

Covalent bonds depend on completely giving up or completely accepting an electron to form the bond. This isn't possible for many microbes without dramatically altering their basic molecular composition.

C.

Covalent bonds typically require enzymes to form/break, whereas hydrogen bonds don't. If covalent bonds were used, it would require much more energy and molecules to be contributed from the cell. Hydrogen bonds don't have these requirements.

D.

Covalent bonds may have more specific and stringent requirements for what atoms can bond with. This makes for stronger bonds, but also decreases the overall potential for bonds that could readily be created between the microbe and its desired surface.

E. C and D

Bloom's Level: 5. Evaluate

Learning Outcome: 02.03

Section: 02.02

Topic: Chemistry

67.

A biologist determined the amounts of several amino acids in two separate samples of pure protein. His data stated that Protein A possessed: 7% leucine, 12% alanine, 4% histidine, 2% cysteine, and 5% glycine. Interestingly, Protein B had the same percentages of each of the same amino acids. He concluded, from this data, that Proteins A and B are the same protein. Based on this information and his conclusion, determine which of the following is the correct statement regarding his findings:

A.

He is correct; they have the same percentages of each amino acid, so they are identical protein molecules.

B.

He is incorrect; while they may possess the same percentages of each amino acid, his findings say nothing about the order in which the amino acids are put together. The order will dictate the overall structure of the protein, so the two could be very different in shape, even though the amino acid totals are the same.

C.

He is correct; the order of the amino acids is irrelevant. It's only the total number of each molecule that is important to structure.

D.

He is incorrect; he hasn't accounted at all for the effects of pH on the composition of the protein and its effects on the individual amino acids.

Bloom's Level: 5. Evaluate

Learning Outcome: 02.11

Section: 02.04

Topic: Chemistry

Chapter 03 Microscopy and Cell Structure

Multiple Choice Questions

1. Eukaryotic cells are
- A. less complex than prokaryotic cells.
 - B.

members of the Domains Bacteria and Archaea.

- C. defined by the presence of a membrane bound nucleus.
- D. able to reproduce more rapidly than prokaryotes.
- E.

less complex than prokaryotic cells, members of the Domains Bacteria and Archaea AND able to reproduce more rapidly than prokaryotes.

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 03.01

Section: 03.01

Topic: Eukaryotes

2. The two magnifying lenses found in a light microscope are the
- A. basic and transverse.
 - B. small and large.
 - C. ocular and objective.
 - D. simple and phase.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.01

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

3. The resolving power of a microscope is described as the ability of the microscope to
- A. separate clearly two objects that are very close together.
 - B. magnify an object.
 - C. separate the colors of an organism's internal structure.
 - D. see structures at various depths in a tissue.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.01

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

4. In viewing a microscopic specimen, oil is used to
- A. increase the refraction.
 - B. decrease the refraction.
 - C. increase the reflection.
 - D. increase the resolution.
 - E. decrease the refraction AND increase the resolution.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.01

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 03 - Microscopy and Cell Structure

5.

The use of oil with certain high-power objective lenses increases

- A. magnification.
- B. the amount of light that enters the objective lens.
- C. resolution.
- D. contrast.
- E.**

resolution AND the amount of light that enters the objective lens.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.01

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

6. If everything else is equal, the best way to observe more details in a microscopic specimen is to

- A.** increase resolution.
- B. increase magnification.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 03.01

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 03 - Microscopy and Cell Structure

7.

The microscope that allows the specimen to appear three-dimensional is the

A.

phase contrast microscope.

B.

interference microscope.

C. fluorescence microscope.

D. dark-field microscope.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

8. Which of the following microscope types would be least useful in viewing unstained living cells?

A.

Phase contrast

B.

Interference

C.

Bright-field

D.

Dark-field

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

9. Electron microscopes differ from light microscopes in that

A. electrons replace light.

B. electromagnets replace glass lenses.

C. resolution is higher.

D. magnification is higher.

E. All of the choices are correct.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

10. Specimens can be observed at the atomic level using a(n)

- A. scanning electron microscope.
- B. transmission electron microscope.
- C. atomic force microscope.
- D. All of the choices are correct.
- E. None of the choices is correct.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

11.

An electron microscope must use electromagnet "lenses" shaped like donuts to direct the electrons onto the specimen. Why?

- A. Electrons are particles-there are also particles in air. Without a vacuum, the electrons would strike and be scattered by the atoms/particles within the air.
- B. Because electrons are highly radioactive, and the chamber must be completely sealed to prevent them from escaping and contaminating the lab area.
- C. This is the method for fixing the specimen to the slide grid for an electron microscope. Without fixing the specimen by vacuum, it would slide off and we wouldn't be able to visualize it.
- D. All of the above are true.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

12. An electron microscope must use electromagnet 'lenses' shaped like donuts to direct the electrons onto the specimen. Why aren't they solid, like the lenses in a light microscope?

- A. A magnetic field cannot be applied across a completely solid object-there must be an opening within the object for the field to be applied through.
- B. The user has to be able to physically look through the magnets to focus the beam of electrons onto the specimen, since the metal of the magnets is opaque. Without a hole in the middle, the user wouldn't be able to see!
- C. The electrons would destroy the electromagnet material unless there was a physical hole for them to travel through on their way to the specimen.

D. Electrons are particles, and particles cannot travel through a solid item. The hole in the middle allows them to travel from the source of the electrons to the specimen.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

13. Which microscope would be the BEST selection for examination of a virus?

- A. Confocal scanning laser microscope
- B. Atomic force microscope
- C. Dark-field light microscope
- D.** Scanning electron microscope

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 4. Analyze

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

14. Individual atoms on the surface of prepared samples can be observed by using the
- A. phase contrast microscope.
 - B. scanning electron microscope.
 - C. dark-field microscope.
 - D. atomic force microscope.**

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

15. Basic dyes
- A. have negative charges.
 - B. have positive charges.**
 - C. are electrically neutral.
 - D. contain both positively and negatively charged particles.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

16. Which of the following stains is/are considered differential?

A.

Capsule stain.

B.

Flagella stain.

C.

Acid-fast stain.

D.

Gram stain.

E.

Acid-fast stain AND Gram stain.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

17. The Gram stain and the endospore stain both use

A.

crystal violet.

B.

iodine.

C. safranin.

D.

malachite green.

E.

acidic dyes.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

18. The order of reagents in the Gram stain reaction are

A. safranin, alcohol, methylene blue, iodine.

B. crystal violet, iodine, alcohol, safranin.

C. methylene blue, alcohol, safranin.

D. crystal violet, alcohol, iodine, safranin.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

19. Which may result in Gram-positive bacteria appearing to be Gram-negative?

A.

Decolorizing too long

B.

Decolorizing too short

C.

Using old cultures

D.

Using young cultures

E.

Decolorizing too long AND using old cultures

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

20. The major criteria used in placing bacteria into different groups is based on differences in

A. cell wall structure.

B. cell membrane permeability.

C. presence or absence of flagella.

D. detergent susceptibility.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 03 - Microscopy and Cell Structure

21. In a basic staining procedure, which is the correct order?

A.

Fix, smear, stain

B.

Smear, fix, stain

C.

Fix, stain, decolorize

D.

Smear, decolorize, stain

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

22. The acid-fast stain

A. reflects differences in cytoplasmic membrane structure.

B. is useful for distinguishing a small group of organisms, including *Mycobacterium*.

C. uses crystal violet and safranin.

D. uses carbofuchsin and methylene blue.

E. is useful for distinguishing a small group of organisms, including *Mycobacterium* AND uses carbofuchsin and methylene blue.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 03.03

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

23. Capsules

- A. take up stain well.
- B. may correlate with an organism's ability to cause disease.
- C. are typically "negatively" stained.
- D. are stained as a wet mount.
- E.**

may correlate with an organism's ability to cause disease, are typically "negatively" stained, AND are stained as a wet mount.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.04

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

24. The endospore stain

- A. is applicable to only a few groups of bacteria.
- B. usually shows the spores as green structures among a background of pink cells.
- C. uses crystal violet as the primary stain.
- D. is an example of a negative stain.
- E.** is applicable to only a few groups of bacteria AND usually shows the spores as green structures among a background of pink cells.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.04

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

25. Immunofluorescence

- A. uses fluorescently tagged molecules.
- B. makes use of the specificity in binding of antibodies.
- C. utilizes acridine orange.
- D. would require a special UV microscope.
- E.**

uses fluorescently tagged molecules, makes use of the specificity in binding of antibodies, AND would require a special UV microscope.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 03.05

Section: 03.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

26. Which term(s) refer(s) to bacterial morphology?

- A. *Bacillus*
- B.

Coccus

- C.

Polyhedral

D.

Coccus AND Bacillus

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.06

Section: 03.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

27. Which is not true of the cytoplasmic membrane?

A. It defines the boundaries of the cell.

B. It is a semipermeable barrier.

C.

It consists mainly of a fixed, static, phospholipid bilayer.

D. It uses proteins as selective gates and sensors.

E. All of the choices are true.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.08

Section: 03.04

Topic: Prokaryotes

28. Which is true of simple diffusion of water?

A. Water usually enters a cell and produces a tremendous osmotic pressure.

B. Water usually leaves the cell and produces negative osmotic pressure.

C. Water tends to enter and leave the cell equally, resulting in no pressure in the cell.

D. The diffusion ultimately relies on the selectively permeable nature of the cell membrane.

E. Water usually enters a cell and produces a tremendous osmotic pressure AND the diffusion ultimately relies on the selectively permeable nature of the cell membrane.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.08

Section: 03.04

Topic: Prokaryotes

29. The cytoplasmic membrane of both eukaryotes and prokaryotes functions to

A. form endoplasmic reticulum.

B. produce energy.

C.

regulate movement of molecules that enter and leave the cell.

D.

form lysosomes and Golgi apparatus.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.08

Section: 03.04

Topic: Prokaryotes

30.

The proteins of bacteria that are involved in the movement of small molecules into the cell are called

A. transport proteins.

B. permeases.

C. carriers.

D. peptidases.

E.

transport proteins, permeases, AND carriers.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.10

Section: 03.04

Topic: Prokaryotes

31. Most solutes pass through the cytoplasmic membrane via

- A. osmosis.
- B. diffusion.
- C. transport proteins.
- D. secretion.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.10

Section: 03.04

Topic: Prokaryotes

32. Facilitated diffusion and active transport

- A. both transport molecules into or out of a cell.
- B. are both not very specific as to which molecules are transported.
- C. both require a concentration gradient to function.
- D. both require an expenditure of energy in order to transport the molecules.
- E. both require a concentration gradient to function AND both require an expenditure of energy in order to transport the molecules.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.10

Section: 03.04

Topic: Prokaryotes

33. The macromolecule found in the cell walls of all bacteria is

A.

lipid A.

B. teichoic acid.

C. peptidoglycan.

D. glycocalyx.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

Bloom's Level: 1. Remember

Learning Outcome: 03.12

Section: 03.06

Topic: Prokaryotes

Chapter 03 - Microscopy and Cell Structure

34.

Which is (are) true concerning the cell wall of prokaryotes?

- A. It determines the shape of the bacteria.
- B. It prevents the bacteria from bursting.
- C. It contains peptidoglycan.
- D. It may be targeted by antimicrobials.
- E.** All of the choices are true.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.12

Section: 03.05

Topic: Prokaryotes

35. Which amino acid(s) is/are found only in the cell walls of bacteria?

A.

Glycerol

B. L-form of glycine

C.

Diaminopimelic acid

D. L-form of methionine

E. L-form of glycine AND L-form of methionine

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.12

Section: 03.05

Topic: Prokaryotes

36. The cell wall of Gram-positive bacteria

A. contains a thin layer of peptidoglycan.

B. contains a thick layer of peptidoglycan.

C. is, due to its thickness, an excellent barrier to most molecules.

D. contains an outer membrane containing LPS.

E. contains a thin layer of peptidoglycan AND contains an outer membrane containing LPS.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.13

Section: 03.05

Topic: Prokaryotes

37. Which molecules are associated with the cell wall of Gram-positive bacteria?

A.

Peptidoglycan

B. D-form amino acids

C.

Teichoic acids

D. LPS

E.

Peptidoglycan, D-form amino acids, AND teichoic acids

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.13

Section: 03.05

Topic: Prokaryotes

38. The cell wall of Gram-negative organisms

- A. has a thick peptidoglycan layer.
- B. has a thin peptidoglycan layer.
- C. is more permeable to various molecules than the Gram-positive cell wall.
- D. is characterized by an outer membrane containing LPS.
- E. has a thin peptidoglycan layer AND is characterized by an outer membrane containing LPS.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.13

Section: 03.05

Topic: Prokaryotes

39. Endotoxin

- A. consists of LPS.
- B. determines bacterial shape.
- C. may have different effects depending on the specific bacterial source.
- D. is toxic due to the effects of the peptide side chains.
- E.

determines bacterial shape, may have different effects depending on the specific bacterial source, AND is toxic due to the effects of the peptide side chains.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.14

Section: 03.05

Topic: Prokaryotes

40. Penicillin would be most effective against

- A. non-growing bacteria.
- B. growing bacteria.
- C. Gram-positive bacteria.
- D. Gram-negative bacteria.
- E. growing bacteria AND Gram-positive bacteria.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 03.15

Section: 03.05

Topic: Antimicrobial Medications

41. Peptidoglycan

- A. may be digested by penicillin.
- B. consists of a long string of NAG coupled to a long string of NAM.
- C. may be digested by lysozyme.**
- D. is found in bacteria, archaea, and plants.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.15

Section: 03.05

Topic: Immunity and Immunization

42. Which of the following bacteria lack a cell wall?

- A. *Treponema pallidum*
- B. *Mycobacterium tuberculosis*
- C. *Staphylococcus aureus*
- D. *Mycoplasma pneumoniae***

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.16

Section: 03.05

Topic: Prokaryotes

43. The capsule

- A. may be used for protection.
- B. may be used to help the bacteria adhere to surfaces.
- C. may be involved in movement.
- D. may be involved in energy production.
- E. may be used for protection AND may be used to help the bacteria adhere to surfaces.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.18

Section: 03.06

Topic: Prokaryotes

44. The structures used for motility in both eukaryotes and prokaryotes are

- A. cilia.
- B. flagella.**
- C. pili.
- D. fimbriae.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.19

Section: 03.06

Topic: Prokaryotes

45. Movement in bacteria

- A. is directly to or away from a stimulus.
- B. relies on the beating of cilia.
- C. is often referred to as run and tumble.
- D. may involve pili.
- E. is often referred to as run and tumble AND may involve pili.**

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.19

Section: 03.06

Topic: Prokaryotes

46. Extrachromosomal DNA is found in _____.

- A. mitochondria
- B. plasmids
- C. nucleoid
- D. nucleoli
- E. mitochondria AND plasmids**

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.21

Section: 03.07

Topic: Genetics

Topic: Prokaryotes

47. Endospores are

- A. a dormant cell type.**
- B. a form of reproduction.
- C. an obligate intracellular parasite.
- D. sensitive to damaging environmental conditions.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.21

Section: 03.07

Topic: Prokaryotes

48. Eukaryotic cells

- A. are more obviously compartmentalized than prokaryotes.
- B. usually have a single circular supercoiled piece of DNA.
- C. contain peptidoglycan in the cell wall.
- D. have the same size ribosomes as prokaryotes.
- E. usually have a single circular supercoiled piece of DNA AND contain peptidoglycan in the cell wall.

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 03.23

Section: 03.08

Topic: Eukaryotes

49. The membranes of eukaryotes and mycoplasma

- A. contain peptidoglycan.

B.

contain sterols for "strength."

- C. contain ergosterol.

- D. are fixed static structures.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.23

Section: 03.08

Topic: Eukaryotes

50. Phagocytosis

- A. is the ingestion of particles and may be performed by animal cells.
- B. is the ingestion of particles and may be performed by bacteria.
- C. is the secretion of proteins.
- D. is the formation of a lysosome.
- E. is the ingestion of particles and may be performed by bacteria AND is the formation of a lysosome.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.24

Section: 03.08

Topic: Eukaryotes

51. The cytoskeleton

A.

is a dynamic structure composed of microtubules, microfilaments, and intermediate filaments.

- B. is a static structure that gives a rigid shape to the cell.
- C. consists of flagella and cilia that are internalized.
- D. is not necessary for movement or reproduction.
- E.

is a static structure that gives a rigid shape to the cell, consists of flagella and cilia that are internalized, AND is not necessary for movement or reproduction.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.25

Section: 03.09

Topic: Eukaryotes

52. The nucleus

- A. is a double membrane sac containing DNA and is found in eukaryotes.
- B. is a single phospholipid membrane sac containing prokaryotic DNA.
- C. is a smaller structure contained within the eukaryotic nucleolus.
- D. cannot transport molecules to the cytoplasm due to the double membrane barrier.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.26

Section: 03.10

Section: 03.13

Topic: Eukaryotes

53. Which is not true of mitochondria and chloroplasts?

- A. They are found in all organisms.
- B. They contain DNA and 70S ribosomes.
- C. They are capable of performing protein synthesis.
- D. They generate ATP.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.26

Section: 03.10

Topic: Eukaryotes

54. An advantage of the smaller size of prokaryotes, compared to eukaryotes, is

- A. high surface area relative to low cell volume.
- B. more rapid growth rates.
- C. compartmentalization of cellular processes in membrane-bound organelles.
- D. predators, parasites, and competitors constantly surround them.
- E. high surface area relative to low cell volume AND more rapid growth rates.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 03.23

Section: 03.08

Topic: Prokaryotes

True / False Questions

55. *Bacillus* and *Clostridium* are medically relevant groups of bacteria that characteristically stain acid-fast.

FALSE

Bloom's Level: 1. Remember

Learning Outcome: 03.22

Section: 03.09

Topic: Prokaryotes

56. LPS is found in the outer membrane of Gram-positive bacteria.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.14

Section: 03.05

Topic: Prokaryotes

57. Drugs that target prokaryotic protein synthesis would have no effect on eukaryotic protein synthesis.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 03.25

Topic: Antimicrobial Medications

58. Penicillin affects the synthesis of phospholipids, thereby producing weak membranes and lysis of the bacteria.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 03.15

Section: 03.05

Topic: Antimicrobial Medications

59. Endospores are involved in bacterial reproduction.

FALSE

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Section: 03.07

Topic: Prokaryotes

60. Lysosomes are bags of digestive enzymes found in prokaryotic cells.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.26

Section: 03.10

Topic: Eukaryotes

61. Smooth endoplasmic reticulum is involved in protein synthesis.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 03.26

Section: 03.10

Topic: Eukaryotes

62.

Mitochondria and chloroplasts are thought to have once been free-living bacteria that invaded another cell.

TRUE

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 03.26

Section: 03.10

Topic: Eukaryotes

63. Cilia and flagella project from the cell and are not covered by cytoplasmic membrane.

FALSE

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 03.25

Section: 03.09

Topic: Eukaryotes

64. Prokaryotes may ingest particles via phagocytosis.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 03.24

Section: 03.08

Topic: Eukaryotes

Multiple Choice Questions

65. You want to examine the structure of the protein coat of a virus by microscopy. Which microscope is your best choice, and why?

A. The scanning electron microscope-it has excellent resolution and magnification, much higher than a light microscope, and can clearly visualize viruses.

B. An atomic force microscope-this has the highest resolution and magnification of the microscopes we discussed. Here, we want to visualize a subcomponent of the virus particles, so we need the best value for resolution and magnification we can possibly achieve.

C. A fluorescent microscope-this will let us tag the protein coat with colored dyes in order to visualize it using this light microscope at 1000x.

D. A bright-field light microscope-of course, we'll need to stain the viruses before we can visualize them against the bright white background at 1000x total magnification.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 03.02

Section: 03.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

66. Your instructor wants you to bring in an example of a biofilm to your lab. Which choice is the best selection for bringing in an intact biofilm for further study?

A.

Disconnecting and bringing in the old, mildewed showerhead from the showers in your dorm

B.

Scraping the mold off of the shower curtain in your dorm's bathroom into a paper cup using a butter knife

C.

Using a toothpick to scrape plaque off of your teeth and smearing it onto a slide to bring in to lab

D.

Wiping a sponge across a slimy boulder in a stream in a nearby park and bringing it in to lab

ASM Objective: 05.02 Most bacteria in nature live in bio-film communities.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 03.07

Section: 03.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

67. A newly developed antibiotic drug shows promise by inhibiting prokaryotic 70S ribosomes in initial studies. However, when animal studies are begun, it's noted that it also inhibits growth of animal cells. Aren't prokaryotic ribosomes different from eukaryotic ribosomes? How can this be happening?

A. Perhaps the ribosomes aren't as different as we thought, so a drug can affect and impair both of them.

B. While the proteins made in the cytosol of eukaryotic cells are, indeed, produced from the 80S eukaryotic ribosome, mitochondria and chloroplasts possess 70S ribosomes. This drug might be impairing the activity of chloroplasts in animal cells.

C. While the proteins made in the cytosol of eukaryotic cells are, indeed, produced from the 80S eukaryotic ribosome, mitochondria and chloroplasts possess 70S ribosomes. This drug might be impairing the activity of mitochondria in animal cells.

D. Perhaps the scientists accidentally combined their cultures of animal and bacterial cells-this might indicate an impairment in growth in the culture. In reality, it's still just impairing the bacterial cells.

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 5. Evaluate

Learning Outcome: 03.26

Section: 03.10

Topic: Eukaryotes

68. A research laboratory is investigating environmental factors that would inhibit the growth of *Archaea*. One question they have is if adding the antibiotic penicillin would be effective in controlling their growth. What do you think the outcome would be if they tried this?

A. The penicillin wouldn't affect the *Archaea* because it prevents crosslinking of peptidoglycan-*Archaea* don't have this compound in their cell walls.

B. The penicillin will inhibit cell wall formation in the *Archaea*, killing them.

C. The penicillin will slow down the growth of the *Archaea* by damaging the cell wall, but they will still be able to grow somewhat.

D. The penicillin will enhance the growth of the *Archaea* by providing a rich nutrient source.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 03.17

Section: 03.05

Topic: Antimicrobial Medications

69. A research lab is trying to produce new antibiotics. They come up with drugs that detach the hydrophilic heads from the phospholipids in plasma membranes. This drug

- A. would be highly toxic and completely useless for human beings—we also have plasma membranes with hydrophilic head groups!
- B. would be highly toxic only to bacteria, making it an excellent drug to develop and test further. Humans have a different phospholipid structure in their cell plasma membranes than bacteria.
- C. would generally not be toxic enough to damage Gram-negative bacteria, as their plasma membranes lie under a thick layer of peptidoglycan.
- D.** would be highly toxic for human beings, but might be useful as a topical antibiotic skin cream. The top layer of skin cells is dead anyway, so it wouldn't matter if this damaged those cells. It could NOT be taken internally, though, by human beings.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 03.08

Section: 03.04

Topic: Antimicrobial Medications

70. A new drug is developed that targets and binds to the lipid A portion of LPS from Gram-negative bacterial cells. This drug shows a high degree of activity and binding in a test tube setting against purified lipid A. Based on this information,

- A. we should fast track this drug and get it out to physicians immediately to help prevent toxic/septic shock in humans.
- B. we should do some animal testing with whole Gram-negative cells and the drug before we jump to any conclusions.
- C.** we should next proceed by moving to testing in a test tube using whole Gram-negative cells to see if it binds with the same strength.
- D. we should abandon the drug entirely. Binding to lipid A won't kill the bacteria, so the drug is useless to develop further. It wouldn't help humans who have septic shock at all.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 4. Analyze

Learning Outcome: 03.14

Section: 03.05

Topic: Infection and Disease

71. A new drug is developed that inhibits formation of the flagellar filament by impairing production of the protein flagellin. Is this going to be a good drug?

- A. Potentially-it would definitely only impair bacteria, but wouldn't matter for the ones that don't use a flagellum to move around.
- B. Potentially-if it could be shown that it also didn't impair the production of the eukaryotic flagellum.
- C. No-our eukaryotic cells depend on flagella to move around in our body, and this would impair that function.
- D. No-bacterial flagella are produced using microtubules, not the protein flagellin. This drug would be useless in eliminating bacteria.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 03.19

Section: 03.06

Topic: Prokaryotes

Chapter 04 Dynamics of Prokaryotic Growth

Multiple Choice Questions

1. All the bacterial cells that result from the replication of a single original bacterial organism are said to be a
- A. population.
 - B. pure culture.**
 - C. lag culture.
 - D. mutant culture.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

2. The scientist that contributed most to the development of pure culture techniques was
- A. Alexander Fleming.
 - B. Louis Pasteur.
 - C. Edward Jenner.
 - D. Robert Koch.**

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 04.04

Section: 04.01

Topic: History of Microbiology

Chapter 04 - Dynamics of Prokaryotic Growth

3. The solidifying agent used most successfully in bacterial nutrient media is

- A. gelatin.
- B. peptone.
- C. agar.**
- D. starch.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

4. Prokaryotic cells divide by a process known as

- A. conjugation.
- B. mitosis.
- C. binary fusion.
- D. binary fission.**

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 04.01

Section: 04.01

Topic: Prokaryotes

5. In nature, bacteria

- A. often grow in close association with many other kinds of organisms.
- B. may remain in a prolonged exponential phase.
- C. frequently synthesize structures such as slime layers.
- D. may adhere to surfaces by means of pili and slime layers.
- E. All of the choices are correct.**

ASM Objective: 05.02 Most bacteria in nature live in bio-film communities.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 04.02

Section: 04.02

Topic: Microbial World

6. Biofilms

- A. are a haphazard mixture of bacteria.
- B. are a polysaccharide-encased community of microorganisms.
- C. may enhance bioremediation efforts.
- D. may protect organisms against harmful chemicals.
- E.**

are a polysaccharide-encased community of microorganisms, may enhance bioremediation efforts, AND may protect organisms against harmful chemicals.

ASM Objective: 05.02 Most bacteria in nature live in bio-film communities.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 04.02

Section: 04.02

Topic: Microbial World

7. The simplest technique for isolating bacteria in growth media is referred to as the

A.

pour-plate method.

B.

streak-plate method.

C. serial dilution method.

D. MPN method.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 04 - Dynamics of Prokaryotic Growth

8. Bacteria may be stored

A. on a slant in the refrigerator.

B. frozen in glycerol solution.

C.

freeze-dried.

D. in broth at 37°C.

E.

on a slant in the refrigerator, frozen in glycerol solution, AND freeze-dried.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

9. In the growth curve of a bacteria population, the bacteria are rapidly increasing in number in the

A. lag phase.

B. exponential (log) phase.

C. stationary phase.

D. decline phase.

E. boomer phase.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

10. During which phase of growth are bacteria most susceptible to antibiotics?

A.

Lag

B.

Stationary

C.

Exponential (log)

D.

Decline

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

11.

When doing experiments with bacteria,

A. it is usually not necessary to standardize which stage of growth is used.

B. it is best to use colonies as all the bacteria in a colony are at the same stage of growth.

C. it is best to use bacteria from the same stage of growth.

D. the age of the bacteria is not important.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 04.05

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identifying Microorganisms

12. During which phase of the bacterial growth curve does the total number of viable cells decline?

A.

Stationary

B.

Lag

C.

Exponential

D.

Death

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

13. The lag phase of the bacterial growth curve is marked by

A. a decrease in cell mass.

B. dormant, metabolically inactive cells.

C. metabolically active cells.

D. vigorously dividing cells.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

14. Late log phase of the bacterial growth curve

A. is marked by the production of primary metabolites.

B. is marked by the production of secondary metabolites.

C. is a transition into the death phase.

D. shows a decline in cell numbers.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

15. During which phase of the bacterial growth curve does a bacterial population become much more resistant to harmful conditions?

A.

Lag phase

B.

Exponential phase

C.

Stationary phase

D.

Late log phase

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

16. A urine sample with more than 100,000 organisms is considered indicative of infection. A urine sample containing 5,000 bacteria, with a generation time of 30 minutes, sits for 3 hours before finally being assayed. How many bacteria will then be present within the sample?

- A. 10,000
- B. 64,000
- C. 100,000
- D. 320,000**

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 04.01

Section: 04.01

Topic: Microbial Growth and Nutrition

17. A pure culture in exponential growth phase has a bacterial concentration of 6.4×10^8 cells/ml. If the bacterium has a generation time of 1 h, how long ago was the cell concentration 8.0×10^7 cells/ml?

- A. 1 h
- B. 2 h
- C. 3 h**
- D. 4 h

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 04.01

Section: 04.01

Topic: Microbial Growth and Nutrition

18. In a rapidly multiplying bacterial population, cell numbers increase

- A. arithmetically.
- B. logarithmically.**
- C. linearly.
- D. indirectly.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

19. Generally the proteins of thermophiles

- A. resist denaturation.
- B. react more efficiently with DNA.
- C. are easily denatured.
- D. have a particular amino acid sequence that restricts bond formation.
- E. are easily denatured AND have a particular amino acid sequence that restricts bond formation.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

20.

A hot tub (approx. 104°F or 40°C) would most likely contain

- A. psychrophiles.
- B. partiers.
- C. thermophiles.
- D. mesophiles.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

21. The optimal temperature for most human pathogens might be expected to range from

- A. 35-40°C.
- B. 20-45°C.
- C. 15-25°C.
- D. 93-98.6°C.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

22. Bacteria on fish caught in the Arctic Ocean would

- A. be psychrophiles.
- B. be mesophiles.
- C. continue to grow while the fish is in the refrigerator.
- D. not grow very well in the refrigerator.
- E. be psychrophiles AND continue to grow while the fish is in the refrigerator.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

23.

Mycobacterium leprae is typically found infecting the ears, toes, and fingers of its host due to its

- A. requirement for well-oxygenated blood.
- B. easy access to those parts.
- C. need for cooler temperatures.**
- D. long incubation period.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

24. Organisms that require gaseous oxygen for metabolism are referred to as

- A. facultative aerobes.
- B. obligate aerobes.**
- C. facultative anaerobes.
- D. microaerophiles.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

25. Which of the following is/are obligate aerobes?

- A. *Clostridium botulinum*
- B. *Escherichia coli*
- C. *Micrococcus luteus*
- D. *Helicobacter pylori*

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial World

26. Organisms that are indifferent to the presence of oxygen and do not use it are

- A. aerotolerant anaerobes.
- B. facultative anaerobes.
- C. obligate aerobes.
- D. microaerophiles.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

27. The enzymes that deal with toxic oxygen-containing molecules is/are

- A. glycolase.
- B. superoxide dismutase.
- C. catalase.
- D.

cytochrome oxidase.

E. superoxide dismutase AND catalase.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.07

Section: 04.04

Topic: Microbial Growth and Nutrition

Chapter 04 - Dynamics of Prokaryotic Growth

28. Shake tubes are used to determine the
- A. pH requirements for bacterial growth.
 - B. temperature requirements for bacterial growth.
 - C.** oxygen requirements for bacterial growth.
 - D. salt requirements for bacterial growth.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

29. The optimum pH for growth of most species of bacteria is
- A. pH 5.
 - B.** pH 7.
 - C. pH 9.
 - D. pH 6.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

30. High concentrations of salt and sugar in foods
- A. are useful in preserving the food.
 - B. tend to draw water out of a cell.
 - C. tend to force water into a cell, causing plasmolysis.
 - D. have no effect on water availability.
 - E.** are useful in preserving the food AND tend to draw water out of a cell.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

Bloom's Level: 3. Apply

Learning Outcome: 04.06

Section: 04.04

Topic: Control of Microbial Growth

31. Carbon, hydrogen, oxygen, nitrogen, phosphorus, and sulfur may be considered

A. minor elements.

B. major elements.

C. neutral elements.

D. acidic elements.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.08

Section: 04.05

Topic: Microbial Growth and Nutrition

32. Trace elements

A.

include zinc, copper, and manganese.

B. are required in large amounts.

C. may be needed for enzyme function.

D. are involved in maintaining pH in the cell.

E.

include zinc, copper, and manganese AND may be needed for enzyme function.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.08

Section: 04.05

Topic: Microbial Growth and Nutrition

33. Small organic molecules that must be provided to bacteria in order for them to grow are called

- A. minerals.
- B. growth factors.**
- C. water.
- D. vitamins.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.09

Section: 04.05

Topic: Microbial Growth and Nutrition

34. The prefix photo- indicates that an organism will make use of _____ for energy purposes.

- A. chemicals
- B. organics
- C. light**
- D. inorganics

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.11

Section: 04.05

Topic: Microbial Growth and Nutrition

35. Organisms that use organic molecules as their source of carbon are called

- A. chemotrophs.
- B. organoheterotrophs.
- C. heterotrophs.**
- D. autotrophs.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.11

Section: 04.05

Topic: Microbial Growth and Nutrition

36. Organisms may derive energy from

- A. sunlight.
- B. metabolizing chemical compounds.
- C. little tiny AAAAAAAAAA batteries.
- D. temperature gradients.
- E.** sunlight AND metabolizing chemical compounds.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.11

Section: 04.05

Topic: Microbial Growth and Nutrition

37. Organisms that use CO₂ as their source of carbon are called

- A. organotrophs.
- B. heterotrophs.
- C.** autotrophs.
- D. chemotrophs.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 04.11

Section: 04.05

Topic: Microbial Growth and Nutrition

38. Chemoheterotrophs

A. use sunlight as an energy source.

B.

use preformed organic molecules as a carbon source.

C.

use preformed organic molecules as an energy source.

D. use inorganic chemicals as an energy source.

E.

use preformed organic molecules as a carbon source AND as an energy source.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.11

Section: 04.05

Topic: Microbial Growth and Nutrition

39. An organism called *Bacillus fastidiosus*

- A. might be expected to be very flexible as to growth requirements.
- B. might be expected to be very strict as to its growth requirements.
- C.

would probably be grown on a medium rich in growth factors.

D.

might be expected to have a rod shape.

E.

might be expected to be very strict as to its growth requirements, would probably be grown on a medium rich in growth factors, AND might be expected to have a rod shape.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 04.10

Section: 04.05

Topic: Microbial Growth and Nutrition

40. Peptone

- A. refers to a hydrolysate of carbohydrates used in growth media.
- B.** refers to a hydrolysate of proteins used in growth media.
- C. consists of a water extract of beef.
- D. consists of a mix of monosaccharides and oligosaccharides.
- E. refers to a hydrolysate of proteins used in growth media AND consists of a water extract of beef.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 03 Metabolic Pathways

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identifying Microorganisms

41. Medically important bacteria are often

- A. grown on agar containing blood.
- B. grown at 37°C.
- C. grown on agar containing chocolate.
- D. grown at a pH of 5.
- E. grown on agar containing blood AND grown at 37°C.**

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

42.

Products that limit pH changes are often incorporated into media and are referred to as

- A. enzymes.
- B. bases.
- C. buffers.**
- D. acids.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

43. A medium that inhibits the growth of organisms other than the one being sought is termed a(n)

- A. synthetic medium.
- B. specific culture medium.
- C. selective medium.**
- D. enrichment medium.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

44. MacConkey agar is

- A. a selective agar.
- B. a differential agar.
- C. a selective and differential agar.**
- D. used to distinguish between bacteria by the type of hemolysis observed.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

45. Candle jars are usually used to

- A. store candles.
- B. provide an atmosphere with CO₂.**
- C. stimulate the growth of obligate anaerobes.
- D. prevent the growth of obligate aerobes.
- E. provide an atmosphere with CO₂ AND stimulate the growth of obligate anaerobes.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.13

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

46. In the cultivation of microaerophilic and anaerobic bacteria,

- A. a(n) candle/anaerobe jar is sufficient.
- B. atmospheric oxygen in a(n) candle/anaerobe jar is converted to water.**
- C.

a packet containing chemicals that generate carbon dioxide and hydrogen is used in a(n) candle/anaerobic jar.

D. oxidizing agents are incorporated into the media that react with oxygen.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.13

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

47. Agar

- A. is a useful nutrient source for most bacteria.
- B. is a hydrolysate of proteins.
- C. stays liquid through the typical range of incubation temperatures.
- D.** has chemical and physical properties that make it almost ideal for solidifying media.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

48. Agar replaced gelatin as the gelling (solidifying) agent for media because

- A. agar is much cheaper.
- B. much fewer bacteria can break down agar than gelatin.
- C. agar is solid at body temperature.
- D. gelatin became unavailable during World War II.
- E.** much fewer bacteria can break down agar than gelatin AND agar is solid at body temperature.

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

True / False Questions

49. It is assumed that every colony observed on a streak plate arose from a single bacterium.

TRUE

ASM Objective: 08.02 Use aseptic and pure culture techniques to enrich for and isolate microorganisms.

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.04

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

50. In microbiology, growth usually refers to an increase in size of the bacteria.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.01

Section: 04.01

Topic: Microbial Growth and Nutrition

51.

There are five stages of growth in an open system of culture.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

52. Secondary metabolites may be antibiotics.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.05

Section: 04.03

Topic: Microbial Growth and Nutrition

53. A single bacterial cell may multiply to form a visible colony.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.01

Section: 04.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

54. Prokaryotes are the only organisms able to use atmospheric nitrogen as a nitrogen source.

TRUE

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.08

Section: 04.05

Section: 04.06

Topic: Environmental Microbiology

55. Freezing is an effective means of destroying bacteria.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.06

Section: 04.04

Topic: Control of Microbial Growth

56. One would expect most strict anaerobic organisms to have superoxide dismutase.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 04.07

Section: 04.04

Topic: Microbial Ecology

57. Differential media only allows certain bacteria to grow.

FALSE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Multiple Choice Questions

58. A microbe is discovered growing near a deep sea thermal vent. When researchers bring a sample up to the surface and try to grow it in a lab at room temperature in a normal incubator, they are unsuccessful. Why?

A.

The pressure isn't the same at sea level as it is on the ocean floor.

B. Oxygen concentrations are very different between the two environments-it's possible the microbe is a strict anaerobe and is poisoned by the air (oxygen) in the lab.

C. Salt concentrations might be different in the media the researchers are attempting to use and the salt water the microbe is used to living in. This might be causing osmotic pressure differences that the microbe can't tolerate.

D.

The temperature is probably different-the thermal vent would be very hot, while these researchers are trying to grow this microbe at room temperature. The enzymes in the cells are probably outside of their normal operating range at room temperature, and therefore nonfunctional.

E. All of the above.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 04.06

Section: 04.04

Topic: Microbial Growth and Nutrition

59. You are a microbiologist working for a pharmaceutical company and discover a new secreted metabolite that can serve as a medication. Your company asks you to oversee the production of the metabolite. Which of the following is something that is NOT important to consider if you need to grow 5,000 liter cultures of bacteria for the purpose of harvesting the metabolite they secrete?

- A. The death rate of the bacteria after stationary phase is complete.
- B. The ideal rate of input of new nutrients into the culture to maintain the cells in log phase.
- C. The ideal rate of pulling off some of the culture in order to maintain the cells in log phase.
- D. The best way to mix the large vat in order to keep it homogenous (constant throughout) in terms of nutrients, temperature, and oxygen levels.
- E. The best way to keep the pH of the entire mixture at the ideal level to promote log phase growth.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 04.05

Section: 04.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

60.

You are working in a clinical laboratory in a hospital setting. You're handed a throat swab from a patient. You are told specifically that the physician is only interested in the presence and type of Gram positive cells. Identification isn't the main goal here-just a first step to work towards determining what Gram positive cells might be there. What might you do first to go about working towards this goal?

- A. Perform a Gram stain.
- B. Streak the sample for isolation on a tryptic soy agar general purpose medium plate.
- C. Streak the sample for isolation on a medium that is selective for Gram positive cells while suppressing Gram negative cell growth.
- D. Grow the microbes on the swab by inoculating a tryptic soy broth liquid medium tube.
- E. Perform an acid-fast stain.

ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

61. A physician sends a stool sample to your lab, and wants to know if there are lactose fermenting microbes in the sample. How might you determine if these microbes are present or not from this mixed-microbe specimen?

- A. Streak the sample for isolation on Thayer-Martin agar (which contains lactose and particular antibiotics for selectivity).
- B. Streak the sample for isolation on a blood agar plate (which contains lactose AND red blood cells that enrich the culture for iron).
- C.** Streak the sample for isolation on a MacConkey agar plate (which contains lactose and a pH indicator that turns pink when acid byproducts are present).
- D. None of the above would work-there's no way to reliably determine this feature from the specimen given.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 04.12

Section: 04.06

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

62. You are in charge of water quality for your city's water treatment plant. Of the methods at your disposal, which will be the most efficient and cheapest method of determining the number of viable bacteria in the water coming out of your plant?

- A. Direct counts using a microscope and a counting chamber.
- B. Using a Coulter counter machine.
- C. Performing serial dilutions of your samples and doing spread plate counts.
- D.** Using membrane filtration followed by placing the membrane in a growth medium for colony counts after incubation.
- E. Biochemical analysis of secondary metabolites in the water that are given off by bacteria.

ASM Objective: 08.04 Estimate the number of microorganisms in a sample (using, for example, direct count, viable plate count and spectrophotometric methods).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 5. Evaluate

Learning Outcome: 04.15

Section: 04.07

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

63.

You take absorbance readings on a spectrophotometer across a 6-hour culture of *E. coli* cells growing in tryptic soy broth (TSB). Your absorbance readings clearly indicate a lag phase, a log phase, and a stationary phase. You come back in and take readings at 8, 10, 12, 14, and 16 hours, but the absorbance number remains the same. Shouldn't it start coming down as the closed batch culture enters death phase? What's the ***most likely thing*** that is happening?

A. Clearly, something is wrong with the spectrophotometer and it isn't measuring the correct values. Perhaps something is on the detector, making it register falsely high absorbance numbers.

B. When we establish a growth curve, we should actually plot the log of the number of viable cells vs. time. However, a spectrophotometer can only measure absorbance. Absorbance is NOT the same as the number of viable cells. Many of the cells in the tube are most likely dead, but the machine can't discriminate between a live cell and a dead one. This keeps the absorbance high even into the death phase.

C. It'll happen-*E. coli* just grow slowly. We haven't gotten to the end of the stationary phase yet. Be patient!

D. Perhaps there's a big smudge of something on the tube that is blocking some of the light. This would lead to an elevated reading for every timepoint after the smudge was placed on the tube.

ASM Objective: 08.04 Estimate the number of microorganisms in a sample (using, for example, direct count, viable plate count and spectrophotometric methods).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 5. Evaluate

Learning Outcome: 04.15

Section: 04.08

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 05 Control of Microbial Growth

Multiple Choice Questions

1. Lister developed his ideas on prevention of infection during medical procedures after studying the work of
- A. Koch.
 - B. Pasteur.**
 - C. Jenner.
 - D. Fleming.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 1. Remember

Learning Outcome: 05.01

Section: 05.01

Topic: History of Microbiology

2. One of the first chemicals used by Lister to prevent surgical infections was
- A. alcohol.
 - B. iodine.
 - C. carbolic acid.**
 - D. mercury.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.01

Section: 05.01

Topic: History of Microbiology

3. The process of killing or removing all of the microorganisms in or on a material is termed
A. sterilization.
B. disinfection.
C. sanitation.
D. antisepsis.

Bloom's Level: 2. Understand
Learning Outcome: 05.01
Section: 05.01
Topic: Control of Microbial Growth

4. A sterile item is free of
A. microbes.
B. endospores.
C. viruses.
D. prions.
E.

microbes, endospores, AND viruses.

Bloom's Level: 2. Understand
Learning Outcome: 05.01
Section: 05.01
Topic: Control of Microbial Growth

5. A suffix used to describe a killing action would be
A. -static.
B. -cidal.
C. -cillin.
D. -tion.

Bloom's Level: 1. Remember
Learning Outcome: 05.01
Section: 05.01
Topic: Control of Microbial Growth

6. Pasteurization

A. is the use of heat to sterilize food products.

B. is the use of heat to reduce numbers of pathogenic/spoilage bacteria in a food item to a safe level.

C.

is a process that uses intense cold to kill microorganisms on foods.

D.

is a process that uses short bursts of radiation to kill microorganisms on foods.

Bloom's Level: 2. Understand
Learning Outcome: 05.01
Section: 05.01
Topic: Control of Microbial Growth

7. Plain soap is very effective in controlling spread of microorganisms because it is

A. bacteriostatic.

B. very effective at the mechanical removal of microorganisms.

C. virucidal.

D. bactericidal.

Bloom's Level: 2. Understand
Learning Outcome: 05.02
Section: 05.01
Topic: Control of Microbial Growth

Chapter 05 - Control of Microbial Growth

8. Nosocomial infections

- A. are acquired at various social events.
- B. are acquired while in the hospital.
- C.

occur because of a susceptible population and presence of disease-causing organisms.

- D. are acquired at sporting events.

E.

are acquired while in the hospital AND occur because of a susceptible population and presence of disease-causing organisms.

Bloom's Level: 2. Understand

Learning Outcome: 05.02

Section: 05.01

Topic: Infection and Disease

9.

To reduce or eliminate disease-/spoilage-causing organisms, food is often subjected to

- A. heat.
- B. chemical additives.
- C. radiation.
- D. cold.
- E.** All of the choices are correct.

Bloom's Level: 1. Remember

Learning Outcome: 05.02

Section: 05.01

Topic: Control of Microbial Growth

Chapter 05 - Control of Microbial Growth

10.

Which of the following organisms are resistant to destruction by typical disinfection methods?

A.

Endospores of *Bacillus* and *Clostridium*

B. *Pseudomonas*

C.

Non-enveloped viruses

D. *Mycobacterium* spp.

E. All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

11. A common environmental organism that may even grow in certain chemical disinfectants is

A. *Escherichia coli*.

B. *Streptococcus pneumoniae*.

C. *Pseudomonas aeruginosa*.

D. enveloped virus.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

12. Upon treatment with heat or chemicals, bacteria will

A. all die immediately.

B.

die at a constant proportion.

C. die at an exponential rate.

D. die at a geometric rate.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

13. In a one D process, how many D values would it take to reduce a population of 10^{10} cells to one survivor?

A. 2

B. 4

C. 5

D. 10

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

14. If a process kills 90% of the organisms per minute, how many minutes would it take to kill all organisms when starting with 100,000 organisms?

- A. 1 minute
- B. 2 minutes
- C. 3 minutes
- D.** 6 minutes

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

15. Microbial death rates may be affected by

- A. pH.
- B. temperature.
- C. the presence of organics.
- D.** All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

16. In order to speed up the sterilization process, which of the following would be useful?

A.

Drying the material

B.

Washing/mechanical removal of bacteria/organic matter

C.

Addition of organics

D.

Nothing

E.

Washing/mechanical removal of bacteria/organic matter AND addition of organics

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

17. Moist heat kills microorganisms by

A.

irreversible denaturation of proteins.

B. destruction of carbohydrates in the cell wall.

C. denaturation of nucleic acids.

D. dissolving the capsule.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

Chapter 05 - Control of Microbial Growth

18. Boiling is not reliable for sterilization because

A.

heat-sensitive instruments may be destroyed.

B.

heat-resistant endospores are unaffected.

C. water boils at a higher temperature at lower altitudes.

D. viruses are more sensitive to heat than bacteria.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

19. Typical conditions used for sterilization are

A. 100°C for 10 minutes.

B. 121°C at 15 psi for 15 minutes.

C. 80°C for 15 minutes.

D. 72°C for 15 seconds.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

20. Which are essentially equivalent treatments?

A.

Dry 200°C heat for 1.5 hours; wet 121°C heat for 15 minutes

B.

Dry 160°C heat for 1.0 hour; wet 200°C heat for 30 minutes

C.

Dry 121°C heat for 1.5 hours; wet 200°C heat for 15 minutes

D.

Dry 100°C heat for 2.0 hours; wet 100°C heat for 30 minutes

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.05

Section: 05.03

Topic: Control of Microbial Growth

Chapter 05 - Control of Microbial Growth

21. Which of the following is not a sterilization method?

A.

Hot air oven

B.

Autoclave

C.

Pasteurization

D.

Filtration

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

22. Which of the following methods sterilize the materials?

A. Pasteurization

B. High-temperature-short-time pasteurization (HTST)

C. Ultrahigh-temperature (UHT) method

D.

None of these are sterilization methods.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

23. The autoclave treatment may be monitored by

- A. heat-sensitive tape.
- B. heat-resistant endospores of *Geobacillus stearothermophilus*.
- C. pressure indicators alone.
- D. waiting for contaminants to appear on freshly poured media.
- E.

heat-sensitive tape AND heat-resistant endospores of *Geobacillus stearothermophilus*.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

24. Commercial canning processes

- A. are geared to destroy *Clostridium botulinum* spores.
- B. kill all endospores.
- C. are especially needed on low acid foods.
- D. are 12D processes (designed to kill 10^{12} endospores).
- E. are geared to destroy *Clostridium botulinum* spores, are especially needed on low acid foods, AND are 12D (designed to kill 10^{12} endospores) processes.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

25. Oxidation of proteins is achieved most readily

- A. by moist heat.
- B. by moist heat under pressure.
- C. in a hot air oven.
- D. in the presence of organics.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.05

Section: 05.03

Topic: Control of Microbial Growth

26. A common application of dry heat in the microbiology laboratory is to
- A. prepare specimens for study.
 - B. sterilize media.
 - C. sterilize plastics.
 - D.** sterilize the inoculating loop.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.05

Section: 05.03

Topic: Control of Microbial Growth

27. Liquid media containing heat-sensitive components would best be sterilized by
- A.

ultraviolet (UV) light at 500 nm.

- B. freezing.
- C. lyophilization.
- D.** membrane filtration.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.06

Section: 05.04

Topic: Control of Microbial Growth

28. Generally, membrane filters are not used to remove
- A. bacteria from liquids.
 - B. microorganisms from gases.
 - C. spoilage agents from alcoholic beverages.
 - D.** enzymes.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

Bloom's Level: 2. Understand

Learning Outcome: 05.06

Section: 05.04

Topic: Control of Microbial Growth

29. Gamma rays cause biological damage in living systems by

A.

producing reactive molecules such as superoxide and hydroxyl-free radicals.

B. causing tiny gravity sinks and black holes to be formed in the substance.

C. introducing toxins.

D. making the substance radioactive.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.07

Section: 05.04

Topic: Control of Microbial Growth

30. Gamma irradiation

A. has not been approved for use on food.

B. can be used to either sterilize or pasteurize, depending on the dose of radiation.

C. leaves some radioactive particles in the treated substance.

D.

usually kills by generating heat and denaturing proteins.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.07

Section: 05.04

Topic: Control of Microbial Growth

Chapter 05 - Control of Microbial Growth

31. Which would be most effective against *Pseudomonas*?

A.

Alcohol

B.

Radiation

C.

Quaternary ammonium compounds

D.

Iodophors

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 05.07

Section: 05.04

Topic: Control of Microbial Growth

32. Ultraviolet radiation at the bactericidal wavelength destroy bacteria by

A. destroying endospores.

B. damaging nucleic acid.

C. preventing spore formation.

D. denaturing proteins.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.07

Section: 05.04

Topic: Control of Microbial Growth

33. Microwaves do not kill organisms directly but kill by
A. the heat they generate in a product.
B. generating free radicals.
C. generating toxins.
D. creating thymine dimers.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

Bloom's Level: 2. Understand

Bloom's Level: 3. Apply

Learning Outcome: 05.07

Section: 05.04

Topic: Control of Microbial Growth

34. Chemical germicides
A. may react irreversibly with proteins/enzymes.
B. may react with cytoplasmic membranes or viral envelopes.
C. may be disinfecting or even sterilizing.
D. are sensitive to dilution factor, time of contact, and temperature of use.
E. All of the choices are true.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.09

Section: 05.05

Topic: Control of Microbial Growth

35. Alcohols are not reliably effective at destroying

A. vegetative bacteria.

B. enveloped viruses.

C.

non-enveloped viruses.

D. endospores.

E.

non-enveloped viruses AND endospores.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

36. Glutaraldehyde

A. is, if given enough time, able to destroy all forms of microbial life.

B. is very good for use on heat-sensitive medical items.

C. attacks lipids.

D.

does not affect non-enveloped viruses.

E. is, if given enough time, able to destroy all forms of microbial life AND is very good for use on heat-sensitive medical items.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

37. Chlorhexidine

- A. is a member of the biguanides.
- B. is extensively used in antiseptics.
- C. is ineffective against vegetative bacteria.
- D. is limited in use due to its high toxicity.
- E.** is a member of the biguanides AND is extensively used in antiseptics.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

38. Ethylene oxide is gas that

A.

is very useful for sterilizing heat or moisture-sensitive items.

- B. is potentially carcinogenic.
- C. is used as a 37% aqueous solution.
- D. is effective against all microorganisms except endospores and viruses.
- E.**

is very useful for sterilizing heat or moisture-sensitive items AND is potentially carcinogenic.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

39. Chlorine

- A. readily reacts with organics to produce potentially carcinogenic trihalomethanes.
- B. is an effective, inexpensive, disinfectant able to destroy all types of microorganisms.
- C. is unaffected by the presence of organic material.
- D. is ineffective when diluted.
- E.** readily reacts with organics to produce potentially carcinogenic trihalomethanes AND is an effective, inexpensive, disinfectant able to destroy all types of microorganisms.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

40. Which is true of iodine?

- A. It does not readily kill endospores.
- B. It may be used as an antiseptic or as a disinfectant.
- C. It is important to use it at the recommended dilution.
- D. It is usually found as tinctures or iodophors.
- E.** All of the choices are true.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

41. Which of the following is true of hydrogen peroxide?

- A. It is a sterilant for inanimate objects and is quickly inactivated on living tissue.
- B. It leaves a toxic residue.
- C. It is broken down by catalase into water and oxygen.
- D. It is even more effective when used in combination with peracetic acid.
- E.**

It is a sterilant for inanimate objects and is quickly inactivated on living tissue; it is broken down by catalase into water and oxygen; AND it is even more effective when used in combination with peracetic acid.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

42. Phenolics

- A. denature proteins and destroy cytoplasmic membranes.
- B. remain effective in the presence of detergents or organic material.
- C. such as triclosan, have been used widely in various lotions and soaps.
- D. reliably inactivate all groups of viruses.
- E.** denature proteins and destroy cytoplasmic membranes, remain effective in the presence of detergents or organic material, AND phenolics such as triclosan, have been used widely in various lotions and soaps.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

43. Hexachlorophene has been particularly effective against

A. *Staphylococcus aureus*.

B. *Micrococcus aureus*.

C. *Escherichia coli*.

D. *Enterobacter aerogenes*.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

44. Quaternary ammonium compounds are

A.

cationic detergents that help wash surfaces.

B. attracted to the negative charge on the microbial cell surface.

C. used as a 37% aqueous solution.

D. very effective against *Pseudomonas*.

E.

cationic detergents that help wash surfaces AND attracted to the negative charge on the microbial cell surface.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

45. Which of the following is(are) considered when selecting a germicidal chemical?

A.

Toxicity

B.

Cost

C.

Compatibility with the material being treated

D.

Environmental impact

E. All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.09

Section: 05.05

Topic: Control of Microbial Growth

46. Silver sulfadiazine, a combination of silver and a sulfa drug, is used to

A. disinfect water for drinking.

B. prevent infection of surgical wounds.

C. prevent infection of second- and third-degree burns.

D. counteract lead poisoning.

E. treat bites from werewolves.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

47. Compounds of tin, mercury, arsenic, and copper are no longer used to prevent microbial growth in cooling water primarily because

- A. antibiotics are cheaper.
- B. other chemicals were shown to be much more effective.
- C. microbes developed resistance to these metals.
- D. their use contributes to serious pollution of natural waters.**
- E. All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

48. The most important function of nitrites in processed foods is to

- A. prevent browning.
- B. inhibit the germination of *Clostridium botulinum* endospores.**
- C. prevent carcinogen formation.
- D. make the food more acidic.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.11

Section: 05.06

Topic: Control of Microbial Growth

True / False Questions

49.

Prions are easily destroyed by common sterilization procedures.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Infection and Disease

50. The endospores of *Pseudomonas* make that organism very difficult to kill.

FALSE

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

51. Upon heat treatment, bacteria die at a constant proportion.

TRUE

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

52. The more bacteria one starts with, the longer it will take to kill them all.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.03

Section: 05.02

Topic: Control of Microbial Growth

53. Heat treatment is an effective method for sterilization or disinfection of all materials.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.06

Section: 05.04

Topic: Control of Microbial Growth

54. Boiling is very effective at removing most common waterborne pathogens.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

55. Pasteurization results in the sterilization of food products.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.04

Section: 05.03

Topic: Control of Microbial Growth

56. Dry heat takes a much shorter time to sterilize material than wet heat.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.05

Section: 05.03

Topic: Control of Microbial Growth

57. 100% ethanol is twice as effective as 60% ethanol at controlling bacteria.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

58. Generally, heavy metals, except silver, have been proven to be too toxic for use on human tissue and are no longer used medically.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

59. Hydrogen peroxide may be used as a sterilant on living tissue.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.10

Section: 05.05

Topic: Control of Microbial Growth

60. Cold and freezing are very effective in killing bacteria.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 05.11

Section: 05.06

Topic: Control of Microbial Growth

61. Organic acids, such as benzoic acid, are often added to foods to prevent microbial growth.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 05.11

Section: 05.06

Topic: Control of Microbial Growth

Chapter 06 Metabolism: Fueling Cell Growth

Multiple Choice Questions

1. Experiments designed by _____ suggested that living cells caused the fermentation of sugar to produce alcohol.

- A. Pasteur
- B. Koch
- C. Wohler
- D. Fleming

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.01

Section: 06.01

Topic: History of Microbiology

2. Studies done by Buchner showed that ground-up yeast cells were able to convert sugar to alcohol. The components of the mixture that were responsible for this transformation were

- A. DNA molecules.
- B. enzymes.
- C. lipids.
- D. carbohydrates.

ASM Objective: 06.02 Microorganisms provide essential models that give us fundamental knowledge about life processes.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 06.01

Section: 06.01

Topic: History of Microbiology

3. Concerning catabolism and anabolism,

- A. they refer to reactions solely dealing with the metabolism of lipids.
- B. the intermediates of one serve as the reactants in the other.
- C. the energy gathered in one is utilized in the other.
- D. they refer solely to the reactions involved in synthesis of carbohydrates.
- E. the intermediates of one serve as the reactants in the other AND the energy gathered in one is utilized in the other.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.01

Section: 06.01

Topic: Microbial Metabolism

4. The general term used to describe the anabolic and catabolic reactions in a cell is

- A. enzymatic.
- B. thematic.
- C. aerobic respiration.
- D. metabolism.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.01

Section: 06.01

Topic: Microbial Metabolism

5. Energy is defined as

- A. water flowing up a dam.
- B. the capacity to do work.**
- C.

the use of high-level phosphate bonds.

D. the potential to fall.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.02

Section: 06.01

Topic: Microbial Metabolism

6. Biosynthetic reactions that require energy for the conversion of molecular subunits into larger molecules are called

- A. kinetic energy.
- B. catabolic reactions.
- C. precursor molecules.
- D. anabolic reactions.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.01

Section: 06.01

Topic: Microbial Metabolism

7. Exergonic reactions

- A. occur when there is more free energy in the products than the reactants.
- B. occur when there is more free energy in the reactants than the products.**
- C. are defined as a decrease in entropy.
- D. are chemoorganotrophic.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.03

Section: 06.01

Topic: Chemistry

8. Free energy

- A. includes the energy lost as heat.
- B. is the amount of energy gained by breaking bonds of a chemical.**
- C. differs for a given reaction depending on the number of steps involved.
- D. always results in a decrease in total energy.
- E. is the amount of energy gained by breaking bonds of a chemical AND differs for a given reaction depending on the number of steps involved.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.03

Section: 06.01

Topic: Chemistry

9. Bacteria that can absorb light energy and convert it into ATP are commonly called

- A. cytochromes.
- B. lysosomes.
- C. chemotrophs.
- D. phototrophs.**
- E. cytochromes AND chemotrophs.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.02

Section: 06.01

Topic: Microbial Metabolism

10. The readily usable energy currency of cells is

- A. electricity.
- B. the electron transport system.
- C. ATP.**
- D. CTP.
- E. the electron transport system AND CTP.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.02

Section: 06.01

Topic: Microbial Metabolism

11. Each of the following statements about chemoorganotrophs is true EXCEPT:

A. They may use substrate-level phosphorylation to produce ATP.

B. They may use oxidative phosphorylation to produce ATP.

C.

They may use photophosphorylation to produce ATP.

D. They utilize an electrochemical gradient.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.02

Section: 06.01

Topic: Microbial Metabolism

12. The name given to the reaction involving removal of electrons or hydrogen atoms from a compound is termed

A. glycolysis.

B. reduction.

C. oxidation.

D. metabolism.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.03

Section: 06.01

Topic: Chemistry

13. The name given to the reaction involving addition of electrons or hydrogen atoms to a compound is termed

A. glycolysis.

B. reduction.

C. oxidation.

D. metabolism.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.03

Section: 06.01

Topic: Chemistry

Chapter 06 - Metabolism: Fueling Cell Growth

14.

NAD in its reduced form is abbreviated as

- A. NADH.
- B. NAD.
- C. NAD⁻.
- D. NADP.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.
ASM Topic: Module 03 Metabolic Pathways
Bloom's Level: 1. Remember
Learning Outcome: 06.03
Section: 06.01
Topic: Microbial Metabolism

15. Glycolysis

- A. is also known as the Embden-Meyerhof-Parnas pathway.
- B. is also known as the Entner-Duodoroff pathway.
- C. is used by *Pseudomonas* and a few other bacteria.
- D. generates some energy and NADPH.
- E. is also known as the Entner-Duodoroff pathway AND is used by *Pseudomonas* and a few other bacteria.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.
ASM Topic: Module 03 Metabolic Pathways
Bloom's Level: 1. Remember
Learning Outcome: 06.04
Section: 06.01
Topic: Microbial Metabolism

16. The most common starting pathway for the breakdown of sugars is

- A. respiration.
- B. fermentation.
- C. glycolysis.
- D. oxidation.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.
ASM Topic: Module 03 Metabolic Pathways
Bloom's Level: 2. Understand
Learning Outcome: 06.04
Section: 06.01
Topic: Microbial Metabolism

17. Glycolysis, the Entner-Duodoroff pathway and the pentose phosphate pathway all produce

- A. pyruvate.
- B. NAD.
- C. NADP.
- D. acetyl-CoA.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.04

Section: 06.01

Topic: Microbial Metabolism

18. Cells degrade sugar largely to

- A. gain energy.
- B. use energy.
- C. convert fat to energy.
- D. utilize coenzymes.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.04

Section: 06.01

Topic: Microbial Metabolism

19. Oxygen serves as the terminal electron acceptor in

- A. fermentation.
- B. aerobic respiration.
- C. anaerobic respiration.
- D. reduction.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

20. The terminal electron acceptor in respiration may be

- A. oxygen.
- B. nitrate.
- C. NAD.
- D. an inorganic molecule.
- E.**

oxygen, nitrate, AND an inorganic molecule.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

21. Which of the following processes generates the greatest amount of energy?

A.

Fermentation

B.

Aerobic respiration

C.

The Entner-Duodoroff pathway

D.

Glycolysis

E.

Fermentation AND the Entner-Duodoroff pathway

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

22. Fermentation

A. uses an inorganic molecule as the final electron acceptor.

B. uses an organic molecule as the final electron acceptor.

C. results in the production of a large amount of ATP.

D. is necessary in some organisms to produce reduced electron carriers.

E. uses an organic molecule as the final electron acceptor AND is necessary in some organisms to produce reduced electron carriers.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

23. Which is/are true regarding organic acids?

- A. They are weak acids.
- B. They are often involved in metabolic reactions.
- C. They often exist in the ionized form at the near-neutral pH found in a cell.
- D. Pyruvate and pyruvic acid refer to different forms of the same substance.
- E.** All of the choices are true.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

24. Pyruvate can be metabolized along two major routes. They are

- A. oxidation and reduction.
- B.** fermentation and respiration.
- C. metabolism and anabolism.
- D. anabolism and catabolism.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.05

Section: 06.01

Topic: Microbial Metabolism

25. The use of the suffix "ase" on a word denotes a(n)

- A. substrate.
- B. product.
- C.** enzyme.
- D. electron acceptor.
- E. substrate AND electron acceptor.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

26. Enzymes act as

A. substrates.

B. catalysts.

C. products.

D. catabolites.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

27.

Enzymes act on _____ to generate _____.

A.

Products, catabolites

B.

Substrates, products

C.

Products, substrates

D.

Glucose, anabolites

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

28. Enzymes speed up reactions by

- A. raising activation energy.
- B. producing heat.
- C. reducing entropy.
- D. lowering activation energy.**
- E. raising activation energy AND reducing entropy.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

29. The mutual interaction of substrate and enzyme is described as a(n)

- A. lock and key arrangement.
- B. induced fit.**
- C. active site.
- D. allosteric site.
- E. active site AND allosteric site.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

30. Most enzymes

A.

are generic, typically recognizing a number of different substrates.

B.

are specific, typically recognizing a single or a few substrates.

C. are active over a wide pH range.

D.

are active over a wide temperature range.

E.

are generic, typically recognizing a number of different substrates AND are active over a wide pH range.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

31. Allosteric enzymes

- A. may bind two substrates.
- B. are used to bind to other enzymes.
- C. have an additional binding site that is involved in regulating enzyme activity.
- D.

are twice as fast as single-site enzymes.

E.

may bind two substrates AND are twice as fast as single-site enzymes.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.09

Section: 06.02

Topic: Microbial Metabolism

32. Feedback inhibition

- A. is a means of regulating the amount of product produced.
- B. often involves the use of allosteric enzymes.
- C. involves inhibiting the last of a series of reactions.
- D. results in raising the activation energy for the reaction.
- E. is a means of regulating the amount of product produced AND often involves the use of allosteric enzymes.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.09

Section: 06.02

Topic: Microbial Metabolism

33. Coenzymes are derivatives of

- A. minerals.
- B. proteins.
- C. lipids.
- D.** vitamins.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.07

Section: 06.02

Topic: Microbial Metabolism

34. The small, non-protein molecules that can be readily separated from an enzyme and are responsible for transfer of atoms from one molecule to another are referred to as

- A. vitamins.
- B. enzymes.
- C. hormones.
- D.** coenzymes.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.07

Section: 06.02

Topic: Microbial Metabolism

35. Which is/are true of coenzymes?

- A. They are organic molecules.
- B. They transfer atoms from one molecule to another.
- C. They may bind to a number of different enzymes.
- D. They are synthesized from vitamins.
- E.** All of the choices are correct.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.07

Section: 06.02

Topic: Microbial Metabolism

36. Environmental factors that may affect enzyme activity include

A.

temperature.

B.

pH.

C.

salt.

D.

temperature, pH, AND salt.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.08

Section: 06.02

Topic: Microbial Metabolism

37. Most enzymes function best at

A. acidic pH and high salt concentrations.

B. basic pH and low salt concentrations.

C. neutral pH and high salt concentrations.

D. slightly above pH 7 and low salt concentrations.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.08

Section: 06.02

Topic: Microbial Metabolism

38. Which is true of competitive inhibition?

- A. It involves an allosteric enzyme.
- B. Substrate and inhibitor both bind to the active site.
- C.

A sulfa antibiotic is a competitive inhibitor.

D. Mercury is a competitive inhibitor.

E.

Substrate and inhibitor both bind to the active site AND a sulfa antibiotic is a competitive inhibitor.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

Bloom's Level: 2. Understand

Learning Outcome: 06.10

Section: 06.02

Section: 06.03

Topic: Microbial Metabolism

39. Mercury in mercurochrome inhibits growth

- A. through competitive inhibition.
- B. through a reversible action.
- C. by oxidizing the sulfhydryl groups in cysteine.
- D. by changing the shape of proteins.
- E. by oxidizing the sulfhydryl groups in cysteine AND by changing the shape of proteins.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 06.10

Section: 06.02

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

40.

The term "precursor metabolite" refers to molecules that

- A. activate cell components.
- B. are used in biosynthesis.**
- C. result from cell activities.
- D. are present but inactive.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.11

Section: 06.03

Topic: Microbial Metabolism

41. Which is true regarding the three central metabolic pathways?

A.

They form high-energy bonds that can be used to synthesize ATP.

- B. They form intermediates that can be oxidized to generate reducing power.
- C. They form precursor metabolites.
- D. All of the choices are correct.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.11

Section: 06.03

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

42. Glycolysis

A. requires oxygen.

B.

produces 3 ATP molecules per molecule glucose.

C.

produces 4 molecules of NAD per molecule glucose.

D. may occur under aerobic or anaerobic conditions.

E.

produces 3 ATP molecules AND produces 4 molecules of NAD per molecule glucose.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

43. The energy yield of any energy-transforming pathway

A. is fixed.

B. is variable depending on the type of enzymes used.

C. is variable depending on the amount of precursor metabolites removed for biosynthesis.

D. is fixed by the amount of oxygen available.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

44. The transition step

- A. links glycolysis to the pentose phosphate pathway.
- B. links the pentose phosphate pathway to the Entner-Duodoroff pathway.
- C. links glycolysis to the TCA cycle.
- D. takes place in the matrix of the nucleus.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

45. The TCA cycle produces

- A. ATP through substrate-level phosphorylation.
- B. NADH.
- C. FADH₂.
- D. precursor metabolites.
- E. All of the choices are correct.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

46. What happens to the carbon molecules in the pyruvic acid that goes through the TCA cycle?

- A. They get incorporated into cell material.
- B. They are excreted as waste organic acids.
- C. They become carbon dioxide.
- D. They form "energy storage molecules" and are stored by the cell.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

47. The electron transport system

- A. requires a membrane.
- B. utilizes the nuclear membrane of eukaryotes.
- C. utilizes the mitochondrial membrane of prokaryotes.
- D. generates a concentration gradient of protons.
- E. requires a membrane AND generates a concentration gradient of protons.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.13

Section: 06.04

Topic: Microbial Metabolism

48. Which type of phosphorylation does not require a membrane?

- A. Substrate-level phosphorylation**
- B. Oxidative phosphorylation
- C. Photophosphorylation
- D. All types of phosphorylation require a membrane.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.03

Section: 06.01

Topic: Microbial Metabolism

49. In the electron transport system

- A. NADH and FADH₂ both donate electrons at the same location.
- B. NADH donates electrons "upstream" of where FADH₂ donates electrons.**
- C. NAD donates electrons at the head of the chain.
- D. NADP donates electrons in the middle of the chain.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.13

Section: 06.04

Topic: Microbial Metabolism

50. Proton motive force

- A. is used to synthesize ATP.
- B. is used to drive flagella rotation.
- C. is used to produce NADH.
- D. is used to produce FADH₂.
- E. is used to synthesize ATP AND is used to drive flagella rotation.**

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.14

Section: 06.04

Topic: Microbial Metabolism

51. In the phototrophic production of energy, the oxygen originates from

- A. carbon dioxide.
- B. water.**
- C. glucose.
- D. hydrogen peroxide.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.19

Section: 06.08

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

52. Anoxygenic photosynthetic bacteria

A. obtain electrons from water.

B.

do not produce oxygen as a by-product.

C. may obtain electrons from H₂S.

D. are obligate aerobes.

E.

do not produce oxygen as a by-product AND may obtain electrons from H₂S.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.20

Section: 06.08

Topic: Microbial Metabolism

53. The sugar component of RNA and DNA nucleotides are synthesized

A. as deoxyribose and then changed to ribose.

B. as ribose and then changed to deoxyribose.

C. separately.

D. using the Calvin cycle.

E. as deoxyribose and then changed to ribose AND using the Calvin cycle.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.22

Section: 06.10

Topic: Microbial Metabolism

True / False Questions

54. The change in free energy of a reaction varies.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.02

Section: 06.01

Topic: Chemistry

55. Both glycolysis and the pentose phosphate pathway oxidize glucose to pyruvate.

TRUE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 06.03

Section: 06.01

Topic: Microbial Metabolism

56. Enzymes are changed by the reaction as they raise the activation energy.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.06

Section: 06.02

Topic: Microbial Metabolism

57. Competitive inhibition usually involves both substrate and inhibitor competing for binding at the allosteric site.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.10

Section: 06.02

Topic: Microbial Metabolism

58. The production of ATP via the electron transport system, in either eukaryotes or prokaryotes, requires the use of a membrane.

TRUE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.14

Section: 06.04

Topic: Microbial Metabolism

59. The TCA cycle must "turn twice" in order to complete the oxidation of one glucose molecule.

TRUE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.12

Section: 06.03

Topic: Microbial Metabolism

60. The terminal electron acceptor in aerobic respiration is water, which is broken down to hydrogen and oxygen.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.13

Section: 06.04

Topic: Microbial Metabolism

Chapter 06 - Metabolism: Fueling Cell Growth

61.

In fermentation, the only ATP produced was during glycolysis and the fermentation reactions usually result in converting NADH to NAD.

TRUE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.16

Section: 06.05

Topic: Microbial Metabolism

62. H_2S and NH_3 may be used by some prokaryotes as energy sources.

TRUE

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.18

Section: 06.07

Topic: Microbial Metabolism

63.

The Calvin cycle produces six ATP for every six turns of the cycle.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

Bloom's Level: 2. Understand

Learning Outcome: 06.03

Learning Outcome: 06.21

Section: 06.09

Topic: Microbial Metabolism

Multiple Choice Questions

Chapter 06 - Metabolism: Fueling Cell Growth

64.

Fermentation is sometimes used as a means of slowing food spoilage. Why would fermentation lead to this outcome?

A. Fermentation is THE process that directly reduces sugars in food. Without sugars, bacteria cannot grow and spoil the food.

B. Fermentation will lead to production of high levels of ethanol (95% or higher!)-ethanol will kill bacteria.

C.

Fermentation will lead to production of acidic by-products, dropping the pH of the food below a level that bacteria can tolerate.

D. This is a trick question-fermentation actually IS food spoilage and cannot be used to prevent it under any circumstances.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 06.16

Section: 06.05

Topic: Microbial Metabolism

65. Why would a cell ferment rather than respire?

A. There's no oxygen present, and it cannot respire anaerobically.

B. It lacks the ability to respire (i.e. no electron transport chain).

C.

There is no oxygen present and it cannot use anaerobic respiration OR it lacks the ability to respire (i.e., no electron transport chain).

D. None of the above.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.16

Section: 06.05

Topic: Microbial Metabolism

66. How would cellulose-degrading bacteria in the rumen (stomachs) of a cow benefit the animal?

A.

The bacteria would produce, secrete, and incorporate organic molecules as they obtain energy from the cellulose in grass and replicate. The cow could then digest both the secreted organic molecules AND the bacteria that synthesized them.

B. The bacteria would produce sugars as they digested the cellulose. These sugars would be given off to the cow as a symbiotic relationship in exchange for the protected location of the stomachs of the cow for the bacteria to grow and replicate in.

C. They wouldn't benefit the animal-they would replicate and cause disease in the animal, leading to its death.

D. They wouldn't benefit the animal-only the bacteria within the animal. This is why cows must have food sources other than grass in order to survive.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 06.16

Section: 06.05

Topic: Microbial Metabolism

67.

A worker in a cheese-making facility argued that whey, a nutrient-rich by-product of the process, should be dumped into a nearby pond to serve as fish food. Is this a good idea or a bad one, and why?

- A. It's a great idea! Let's feed the fish and help them multiply!
- B. Bad idea-the fish won't be able to eat the whey, so it will sit there rotting and pollute the waters, making them uninhabitable for the fish.
- C.** Bad idea-bacteria would thrive on this rich nutrient source and multiply readily. As they multiply, they'll use the oxygen in the water to harvest the energy from the whey, depleting it. As the oxygen depletes below a certain point, the fish (and perhaps other organisms) will not be able to survive.
- D. Great idea! This will not only feed the fish, but also microbes and other small organisms. It'll enhance the entire food chain and help all of them!

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 06.13

Section: 06.04

Topic: Microbial Metabolism

68. A student argued that aerobic and anaerobic respiration should produce the same amount of energy. He argued that both processes are essentially the same-only the terminal electron acceptor is different. What's wrong with his argument?

A. Nothing-they **SHOULD** both produce the same amount of energy. Clearly he knows more than his professors or the writers of his textbook.

B.

Not all electrons are brought into the electron transport chain with the same amounts of potential energy. NADH, for example, enters the electron transport chain "further up" than FADH_2 -so it will lead to less proton motive force being generated, and thus less eventual ATP.

C.

Not all electron acceptors are the same-some are closer in terms of electronegativity to their high-energy electron carrier molecules (e.g., NADH) than others. The amount of energy that can eventually be obtained is directly proportional to the degree of difference in electronegativity between the high-energy electron carrier and the eventual terminal electron acceptor. The greater the difference, the greater the energy obtained. Oxygen typically has the highest electron affinity of the terminal electron acceptors utilized.

D. He should believe what his instructors tell him, without question-and they say aerobic respiration is better, so it **MUST** be so.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 06.14

Section: 06.04

Topic: Microbial Metabolism

69. Chemolithotrophs near hydrothermal vents support a variety of life forms. Why is this analogous to photosynthetic microbes supporting life forms closer to the surface of the planet?

A.

Because all life forms need some energy source, electron source, and carbon source. Chemolithotrophs fix inorganic carbon and, if consumed by other microbes, could serve as sources for all three requirements for life. This is very similar to the role that photosynthetic microbes play in the top levels of the oceans/lakes.

B. Because chemolithotrophs will also utilize energy from sunlight to form their sugars/get their chemical energy...much like photosynthetic microbes.

C. Because chemolithotrophs also pull in carbon dioxide as their carbon source, just like photosynthetic microbes.

D. Because photosynthetic microbes utilize heat energy from the sun as an energy source. Chemolithotrophs utilize heat energy from hydrothermal vents, but it's still heat energy. This makes both microbes similar.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 06.18

Section: 06.07

Topic: Microbial Metabolism

Chapter 07 The Blueprint of Life, from DNA to Protein

Multiple Choice Questions

1. The phrase "one gene-one enzyme" is associated with the work of
- A. Lederberg.
 - B. Watson and Crick.
 - C. Beadle and Tatum.
 - D. Mendel.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.01

Section: 07.01

Topic: History of Microbiology

2. The two strands of DNA are bonded to one another by
- A. covalent bonds.
 - B. oxygen bonds.
 - C. hydrogen bonds.
 - D. carbon bonds.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.01

Section: 07.01

Topic: Chemistry

Chapter 07 - The Blueprint of Life, from DNA to Protein

3. Which pairing is incorrect?

- A. A:T
- B. G:C
- C. A:U
- D. A:G**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

4. What structure is indicated by: 10A, 15T, 3G, 7C?

A.

Double-stranded RNA

B.

Double-stranded DNA

C.

Single-stranded RNA

D.

Single-stranded DNA

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

5. Without changing the sequence or the orientation of the sequence(s), which is/are complementary to the sequence 5' AGGCUAAC 3'?

- A. 5' TCCGATTG 3'
- B. 3' TCCGATTC 5'**
- C. 5' CTTAGCCT 3'
- D. 3' TAAGCTTA 5'
- E. 3' TCCGATTC 5' AND 5' CTTAGCCT 3'

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

6. GCCCAAAG is a molecule of

- A. RNA.
- B. DNA.
- C. protein.
- D. cannot tell as written.**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

7. Which may be or is an RNA molecule?

- A. AGCCTAC
- B. GGGCCCA
- C. GCCCUUA
- D. AGCCTAC AND GGGCCCA
- E. GGGCCCA AND GCCCUUA**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

Chapter 07 - The Blueprint of Life, from DNA to Protein

8. RNA is characterized by which one of the following features?

A.

Deoxyribose

B.

Thymine

C.

Ribose

D.

Double-stranded

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

9. DNA is characterized by which of the following feature(s)?

A.

Ribose

B.

Single-stranded

C.

Deoxyribose

D.

Thymine

E.

Deoxyribose AND thymine

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

10. Which is not true of RNA?

- A. It is usually single-stranded.
- B. It functions in the cytoplasm.
- C.

It contains both uracil and thymine.

- D. It contains ribose.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

11. The 3' end of DNA

- A. refers to the end that has a hydroxyl group attached to the number 3 carbon of deoxyribose.
- B. attaches to the 5' phosphate group of the incoming nucleotide.
- C. always has thymine attached to it.
- D. usually has guanine attached to it.
- E. refers to the end that has a hydroxyl group attached to the number 3 carbon of deoxyribose AND attaches to the 5' phosphate group of the incoming nucleotide.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

12. Which of the following is/are true of DNA replication?

- A. It starts at the origin of replication.
- B. Nucleotides are added to the 3' end.
- C. It requires an RNA primer to get started.
- D. It utilizes polymerases.
- E.** All of the choices are true.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.03

Section: 07.02

Topic: Genetics

13. DNA replication is

- A. conservative.
- B. interspersive.
- C.** semiconservative.
- D. chain reference.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.03

Section: 07.02

Topic: Genetics

14. Which is true about DNA replication?

- A. It is semiconservative.
- B. It starts at an origin of replication.
- C. It is bi-directional.
- D. It requires RNA primers.
- E.** All of the choices are correct.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.03

Section: 07.02

Topic: Genetics

15. The term antiparallel

- A. refers to the structure of single-stranded RNA.
- B. is synonymous with semiconservative.
- C. refers to the opposite orientation of the two strands in DNA.
- D. refers to a type of prokaryotic replication.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.03

Section: 07.02

Topic: Genetics

16. The lagging strand

A.

is a type of RNA.

B. is found during RNA replication.

C. is necessary due to the properties of the enzymes and the antiparallel nature of DNA.

D. is always the bottom strand.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.03

Section: 07.02

Topic: Genetics

17. Which is true about the RNA transcript?

- A. It is formed using the DNA minus strand as a template.
- B. It has the same 5'-3' orientation as the DNA positive strand.
- C. It is made in short fragments that are then stitched together.
- D. The template starts at the promoter region.

E.

It is formed using the DNA minus strand as a template, it has the same 5'-3' orientation as the DNA positive strand, AND the template starts at the promoter region.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.04

Section: 07.03

Topic: Genetics

18. Which is true about prokaryotic (bacterial) RNA polymerase?

- A. It is used during transcription.
- B. It does not require a primer.
- C. It has a detachable subunit, sigma factor, which recognizes the promoter.
- D. It reads the template in the 3'-5' direction.

E. All of the choices are true.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.06

Section: 07.04

Topic: Genetics

19. The specific sequence of nucleotides in the DNA to which the RNA polymerase binds is the

- A. regulatory region.
- B. promoter region.**
- C. sigma region.
- D. core region.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.04

Section: 07.03

Topic: Genetics

20. The transcription terminator

- A. results in a hairpin loop structure in RNA.
- B. results in the polymerase falling off the DNA template.
- C. stops DNA polymerase.
- D. adds a terminator nucleotide to the RNA.
- E. results in a hairpin loop structure in RNA AND results in the polymerase falling off the DNA template.**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.04

Section: 07.03

Topic: Genetics

21. How many nucleotides are in a codon?

- A. 1
- B. 2
- C. 3**
- D. 4
- E. 5

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

22. There are _____ codons to code for the 20 possible amino acids.

- A. 20
- B. 30
- C. 64
- D. 61**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

23. The genetic code has more than one codon for some amino acids. This is an example of

- A. evolution.
- B. stringency.
- C.**

redundancy.

- D. translation.**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

24. Which molecule carries an anticodon?

- A. DNA
- B. mRNA
- C. rRNA
- D. tRNA**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

25. AUG

- A. is only used as the start codon.
- B. codes for methionine.
- C. determines the reading frame.
- D. is one of the stop codons.
- E.** codes for methionine AND determines the reading frame.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

26. The amino acid that is placed first during translation in bacteria, mitochondria, and chloroplasts is

- A. glycine.
- B. methionine.
- C.** *N*-formyl-methionine.
- D. serine.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.04

Section: 07.06

Topic: Genetics

27. The placement of the amino acid during translation is determined by the

A.

DNase, which transcribes both molecules.

B. complementarity of the codon-anticodon.

C. sequence of nucleotides at the 5' end of the tRNA.

D. secondary structure of the newly forming protein.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

28. What is the number of tRNA molecules that may be associated with translation?

A.

16

B.

20

C. 64

D.

Fewer than 64

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

29. The P-site

- A. is found on the polymerase enzyme.
- B. is an allosteric site.
- C. is a promoter site.
- D. is the peptidyl site on the ribosome.**
- E. is an allosteric site AND is a promoter site.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

30. The E-site

- A. is found on the RNA polymerase enzyme.
- B. is responsible for the release of the tRNA.**
- C. is found on the 35S polysome.
- D.

is the aminoacyl site.

E.

is responsible for the release of the tRNA AND is the aminoacyl site.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

31. A stop codon

- A. codes for the stop amino acid s-methyl-methionine.
- B. forms a hairpin loop forcing the ribosome to fall off.
- C. codes for no amino acid.
- D. enhances the binding of the e-polymerase.
- E. codes for the stop amino acid s-methyl-methionine AND forms a hairpin loop forcing the ribosome to fall off.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

32. Post-translational modification may include

- A. formation of exons and introns.
- B. folding of the protein, often with the aid of chaperones.
- C. removal of the signal sequence.
- D. addition of glycine tags.
- E.

folding of the protein, often with the aid of chaperones, AND removal of the signal sequence.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

33. The ribosomes

- A. move along the tRNA in a 3'-5' direction.
- B. move along the mRNA in a 5'-3' direction.
- C. move along the DNA in a 5'-3' direction.
- D.

provide a platform that brings the amino acids into a favorable position for joining.

E.

move along the mRNA in a 5'-3' direction AND provide a platform that brings the amino acids into a favorable position for joining.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

34. In DNA sequence analysis

- A. the + strand of DNA is used.
- B. the start codon is ATG.
- C. ORFs are searched for.
- D. codon usage is a helpful indicator for protein coding areas.
- E.** All of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 07.12

Section: 07.08

Topic: Genetics

35. Some segments of the precursor mRNA in eukaryotes are non-coding and are called

- A. exons.
- B. introns.**
- C. integrans.
- D. uselessans.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.06

Section: 07.04

Topic: Genetics

36. Bacteria use _____ attached TO the polymerase to direct RNA polymerase to promoters; eukaryotic cells use _____ that attach directly to the DNA first instead.

- A. sigma factors; transcription factors**
- B. transcription factors; sigma factors
- C. ribosomes; sigma factors
- D. tRNA; rRNA

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.06

Section: 07.04

Topic: Genetics

37. Ribozymes

- A. are complexes of ribosomes and RNA.
- B. are self-catalytic RNA.
- C. suggest that nucleic acids evolved before proteins.
- D. are enzymes that degrade RNA and therefore have potential for clinical applications.
- E. are self-catalytic RNA AND suggest that nucleic acids evolved before proteins.**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

38. The scientists responsible for the idea that RNA can act as a catalyst were

- A. Watson and Crick.
- B. Beadle and Tatum.
- C. Altman and Cech.
- D. Lederberg and Stanley.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.05

Section: 07.03

Topic: History of Microbiology

39. Signal transduction

- A. is the relay of information about conditions outside a cell to inside the cell.
- B. often relies on a two component system.
- C. may involve phosphorylation of various molecules.
- D. is used by certain pathogens to sense low magnesium conditions.
- E. All of the choices are correct.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.07

Section: 07.05

Topic: Genetics

40. Quorum sensing

- A. is used by bacteria to sense the density of cells.
- B. involves the production and monitoring of the amount of homoserine lactone present.
- C. is used by bacteria to limit the density of bacteria.
- D. is used by eukaryotes to sense the presence of bacteria.
- E. is used by bacteria to sense the density of cells AND involves the production and monitoring of the amount of homoserine lactone present.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.07

Section: 07.05

Topic: Genetics

41. Gene regulation may entail
- A. turning on genes only when needed.
 - B. turning off genes when not needed.
 - C. turning on or off entire groups of genes.
 - D.** All of the choices are correct.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

42. The regulatory protein
- A. binds to the promoter region of DNA.
 - B.** may inhibit or enhance transcription.
 - C. may control translation of the operon.
 - D. affects the activity of the DNA polymerase.
 - E. binds to the promoter region of DNA AND affects the activity of the DNA polymerase.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

Bloom's Level: 2. Understand

Bloom's Level: 4. Analyze

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

43. Operon(s) in bacteria

A.

refers to a group of genes that are controlled in a coordinate fashion.

B. involve polycistronic mRNA.

C. involve monocistronic mRNA.

D. are also known as Wagnerons.

E.

refers to a group of genes that are controlled in a coordinate fashion AND involve polycistronic mRNA.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

44. The set of genes in bacteria that are linked together and transcribed as a single unit is referred to as a(n)

A. operon.

B. regulon.

C. operator.

D. repressor.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

45. The DNA site to which the repressor protein binds is the

- A. operon.
- B. regulon.
- C. operator.**
- D. repressor.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

Bloom's Level: 1. Remember

Learning Outcome: 07.04

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

46. The molecules that bind to a repressor and cause it to no longer bind to the operator are called

- A. activators.
- B. repressors.
- C. introns.
- D. inducers.**

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

Bloom's Level: 2. Understand

Learning Outcome: 07.04

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

47. Repressors

- A. are involved in negative control.
- B. are involved in positive control.
- C. always bind to the promoter.
- D. bind or do not bind to the operator depending on their shape (conformation).
- E. are involved in negative control AND bind or do not bind to the operator depending on their shape (conformation).**

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

48. Activators

- A. are involved in negative control.
- B. are involved in positive control.
- C. always bind to the promoter.
- D. are allosteric proteins.
- E.** are involved in positive control AND are allosteric proteins.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

49. Negative control means a regulator molecule is

- A. bound and transcription starts.
- B. removed and transcription is inhibited.
- C. bound and transcription is inhibited.
- D. removed and transcription starts.
- E.** bound and transcription is inhibited AND removed and transcription starts.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

50. Glucose

- A. is preferentially used over lactose in *E. coli* as a result of catabolite repression.
- B. levels are directly sensed via catabolite repression.
- C. levels are the inverse of cAMP levels.
- D. levels directly affect the production of lactose dehydrogenase.
- E.**

is preferentially used over lactose in *E. coli* as a result of catabolite repression AND glucose levels are the inverse of cAMP levels.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.10

Section: 07.06

Topic: Genetics

51. The *lac* operon

- A. is an example of negative control.
- B. is affected by catabolite repression.
- C. produces lactose.
- D. is an example of a regulon.
- E.** is an example of negative control AND is affected by catabolite repression.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.10

Section: 07.06

Topic: Genetics

52. CAP

- A. is involved in positive control.
- B. stands for cyclic amp protein.
- C. works in conjunction with cAMP.
- D. is involved in negative control.
- E.** is involved in positive control AND works in conjunction with cAMP.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.10

Section: 07.06

Topic: Genetics

53. RNAi

- A. is the form of mRNA that initiates translation.
- B.

uses short pieces of single-stranded RNA to direct the degradation of specific RNA transcripts.

- C. is a mechanism of genetic regulation found in eukaryotes.
- D. is any chemical that inhibits transcription.

E.

uses short pieces of single-stranded RNA to direct the degradation of specific RNA transcripts AND is a mechanism of genetic regulation found in eukaryotes.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.11

Section: 07.07

Topic: Genetics

True / False Questions

Chapter 07 - The Blueprint of Life, from DNA to Protein

54.

Adenine binds to thymine via three hydrogen bonds.

FALSE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

55. One end of a strand of DNA is different from the other end.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.01

Section: 07.01

Topic: Genetics

56. DNA replication is usually unidirectional.

FALSE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

Bloom's Level: 2. Understand

Learning Outcome: 07.03

Learning Outcome: 07.04

Section: 07.02

Topic: Genetics

57. The minus strand of DNA serves as the template for RNA production.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.04

Section: 07.03

Topic: Genetics

58. Antisense RNA is the complement of the plus strand and may be useful in inhibiting translation.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.11

Section: 07.07

Topic: Genetics

59.

The genetic code is nearly universal.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

Chapter 07 - The Blueprint of Life, from DNA to Protein

60.

A codon consists of two nucleotides.

FALSE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

61. The anticodon determines which amino acid is linked to its tRNA.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

62. Ribozymes are non-protein molecules with catalytic activity.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

Multiple Choice Questions

63. A drug that inhibits the activity of bacterial DNA gyrase _____ be a good antibiotic because _____.
- A. would; it would inhibit all DNA synthesis
 - B. would NOT; it would inhibit all DNA synthesis, even our own cell's DNA synthesis
 - C. would; it would selectively inhibit bacterial DNA synthesis due to differences between bacterial/human gyrase**
 - D. would NOT; the DNA replication machinery could still function, even with impaired DNA gyrase enzyme

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

Bloom's Level: 5. Evaluate

Learning Outcome: 07.03

Learning Outcome: 07.04

Section: 07.02

Topic: Genetics

64. Why is it a good idea for a bacterial cell to be able to utilize glucose FIRST as an energy source (until it's used up), THEN switch to lactose?
- A. Glucose is an easier compound to break down and obtain energy from than lactose.
 - B. Lactose cannot be used by bacterial cells as an energy source.
 - C. It's about conservation of energy-why expend the energy to make the extra enzymes for breaking down lactose when glucose is right there and doesn't need the extra enzymes for breakdown.
 - D. Glucose provides 10x as much energy when broken down as lactose.
 - E.**

Glucose is no easier compound to break down and obtain energy from than lactose AND It's about conservation of energy-why expend the energy to make the extra enzymes for breaking down lactose when glucose is right there and doesn't need the extra enzymes for breakdown.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

Bloom's Level: 5. Evaluate

Learning Outcome: 07.04

Learning Outcome: 07.10

Section: 07.06

Topic: Genetics

65. Does the presence of introns/exons in eukaryotic cells provide more potential diversity in gene products (proteins) than is possible in prokaryotic cells?

A. It doesn't-this is a trick question. There's the same potential for gene products (proteins) in a bacterium with 1,000 genes as there is in a eukaryotic cell with 1,000 genes.

B. It does-each exon and each intron could be used individually and discretely to make a gene product (protein). Since bacteria lack these, they will have less ability to create different proteins.

C. It does-exons/introns can be spliced together in different ways post-transcription to yield different mRNAs (and therefore, different proteins). Bacteria lack this system, so the gene you transcribe is translated into the only protein you'll end up getting.

D. It does-exons/introns can be spliced together in different ways at the DNA level to eventually yield different mRNAs (and therefore, different proteins). Bacteria lack this system, so the gene you transcribe is translated into the only protein you'll end up getting.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 07.06

Section: 07.04

Topic: Genetics

66. A graduate student is trying to isolate bacterial mRNA for an enzyme that will degrade trinitrotoluene (TNT). She's frustrated to find that the enzyme isn't produced when the bacterium in question is grown on nutrient agar. What might she do to solve the problem and obtain the mRNA?

A. Add nitrogen and toluene to the agar to drive up synthesis of TNT.

B. Add TNT to the agar-this will drive synthesis of the enzyme to degrade it, leading to production of the mRNA the student is looking for.

C. Remove glucose from the agar-this will cause the bacteria to shift to other compounds for their energy purposes.

D. Remove all sugars from the agar-this will cause the bacteria to shift to other compounds for their energy purposes.

E. Add TNT to the agar-this will drive synthesis of the enzyme to degrade it, leading to production of the mRNA the student is looking for AND remove all sugars from the agar-this will cause the bacteria to shift to other compounds for their energy purposes.

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 07.09

Section: 07.06

Topic: Genetics

67. Cells are often ground up with abrasive to get to their internal enzymes/molecules, followed by removal of the abrasives. Here are two situations and two outcomes. What is the correct interpretation of the results? In situation #1, radioactive amino acids are mixed with ground-up cell material. Radioactive proteins are produced. In situation #2, radioactive amino acids AND the enzyme RNase (an enzyme that degrades RNA) are mixed with ground-up cell material. No radioactive proteins are produced.

A. The mRNA from the cell can be used to make proteins with the radioactive amino acids in the first situation. In the second situation, the mRNA is destroyed by the RNase before it can be translated into protein containing the radioactive amino acids.

B. The DNA from the cell can be translated into protein using the radioactive amino acids in the first situation. The RNase in the second situation degrades the ribosomal RNA (rRNA), preventing ribosomes from forming and making proteins with the radioactive amino acids.

C. The radioactivity in the amino acids corrupts the tRNA molecules, leading to no protein production in the second scenario.

D. The results cannot be interpreted-there isn't enough information given in the question.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

68.

Cells are often ground up with abrasive to get to their internal enzymes/molecules, followed by removal of the abrasives. Here are three situations and three outcomes. What is the correct interpretation of the results? In situation #1, radioactive amino acids are added to cell material, and radioactive proteins are produced. In situation #2, radioactive amino acids, cell material, and the enzyme DNase (degrades DNA) are added together. Radioactive proteins are still produced. In situation #3, the ground-up cell material is allowed to sit for 24 hours before radioactive amino acids and DNase are added to it. No radioactive protein is produced. What is the most likely interpretation?

A.

RNA polymerase has no activity after 24 hours, so no mRNA is transcribed and translated into radioactive proteins in the last scenario.

B. The radioactivity in the amino acids is altering/degrading the tRNA molecules, leading to no protein production in the last scenario.

C.

Natural RNases present in the ground-up material will degrade any existing mRNAs in that 24-hour interval. Added DNases breakdown DNA so that new RNAs are not synthesized. This will lead to a loss of capability to translate protein in the last scenario.

D. The results are not interpretable from the information given.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 07.05

Section: 07.03

Topic: Genetics

Chapter 08 Bacterial Genetics

Multiple Choice Questions

1.

The properties of a cell that are determined by its DNA composition are its

- A. phenotype.
- B. genotype.
- C. metabolism.
- D. nucleoid.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.01

Section: 08.01

Topic: Genetics

2. The source of variation among microorganisms that were once identical is

- A. antibiotic resistance.
- B. virulence factors.
- C. sigma factors.
- D. mutation.

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 08.02

Section: 08.01

Topic: Genetics

Chapter 08 - Bacterial Genetics

3. The characteristics displayed by an organism in any given environment is its

- A. genotype.
- B. archaetype.
- C. mutatotype.
- D. phenotype.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.01

Section: 08.01

Topic: Genetics

4. Which change in a gene's DNA sequence would have the least effect on the eventual amino acid sequence produced from it?

A.

Deletion of two consecutive nucleotides

B.

Addition of one nucleotide

C.

Addition/deletion of three consecutive nucleotides

D.

Substitution of one nucleotide AND addition of 1 nucleotide

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 3. Apply

Learning Outcome: 08.04

Section: 08.02

Topic: Genetics

5. The designation *his*⁻ refers to

- A. the genotype of a bacterium that lacks a functional gene for histidine synthesis.
- B. the genotype of a bacterium that has a functional gene for histidine synthesis.
- C. the opposite of a *hers* gene.
- D. bacteria that are auxotrophic for histidine.
- E. the genotype of a bacterium that lacks a functional gene for histidine synthesis AND bacteria that are auxotrophic for histidine.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.02

Section: 08.01

Topic: Genetics

6. Segments of DNA capable of moving from one area in the DNA to another are called

- A. base analogs.
- B. intercalating agents.
- C. transposons.**
- D. inverted repeats.

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 08.05

Section: 08.02

Topic: Genetics

7. Transposons

- A. are informally known as jumping genes.
- B. may cause insertion mutations.
- C. may cause knockout mutations.
- D. were first recognized in plants.
- E.** All of the choices are correct.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.05

Section: 08.02

Topic: Genetics

8. Chemical mutagens often act by altering the

- A. alkyl groups of the nucleobase.
- B. nucleobase sequence.
- C. number of binding sites on the nucleobase.
- D.** hydrogen bonding properties of the nucleobase.

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

9. The largest group of chemical mutagens consists of

- A. radiation.
- B. base analogs.
- C. nitrous acid.
- D.** alkylating agents.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

10. Chemical mutagens that mimic the naturally occurring bases are called

- A. nitrogen mustards.
- B. alkylating agents.
- C. base analogs.**
- D. nitrous oxide.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

11. Planar molecules used as chemical mutagens are called

- A. nitrous oxide.
- B. base analogs.
- C. alkylating agents.
- D. intercalating agents.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

Chapter 08 - Bacterial Genetics

12. Intercalating agents

A. act during DNA synthesis.

B.

often result in frameshift mutations.

C. only act in dormant cells.

D. alter the hydrogen bonding properties of the bases.

E.

act during DNA synthesis AND often result in frameshift mutations.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

13. Irradiation of cells with ultraviolet light may cause

A.

four nucleotides to covalently bind together.

B. thymine dimers.

C. adenine complementary base pairing with cytosine.

D. the addition of uracil.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.08

Section: 08.03

Topic: Genetics

14. On which of the following DNA strands would UV radiation have the most effect?

- A. AACCGGG
- B. TATATACG
- C. AUAUCGAU
- D.** AATTAGTTC
- E. TATATACG AND AATTAGTTC

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.08

Section: 08.03

Topic: Genetics

15. Thymine dimers are dealt with by

- A. no repair mechanisms.
- B. photoreactivation repair.
- C. SOS repair.
- D. excision repair.
- E.** photoreactivation repair AND excision repair.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.11

Section: 08.04

Topic: Genetics

16. The formation of a covalent bond between two adjacent thymines is caused by

- A. mustard gas.
- B. alkylating agents.
- C. microwave radiation.
- D.** UV radiation.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.08

Section: 08.03

Topic: Genetics

17. X-rays

- A. have no effect on DNA.
- B. cause thymine trimers.
- C. cause single and double strand breaks in DNA molecules.
- D. make the DNA radioactive.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.08

Section: 08.03

Topic: Genetics

18. DNA repair mechanisms occur

- A. only in prokaryotes.
- B. only in eukaryotes.
- C. in both eukaryotes and prokaryotes.
- D. in neither eukaryotes or prokaryotes.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.09

Section: 08.04

Topic: Genetics

19. Which is not true about mismatch repair?

- A. It utilizes an endonuclease.
- B. It requires DNA polymerase and DNA ligase.
- C. It utilizes the state of methylation of the DNA to differentiate between strands.
- D. It removes both strands in the mismatch area.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.09

Section: 08.04

Topic: Genetics

20. Antibiotics

- A. cause mutations to occur.
- B. may act as alkylating mutagens.

C.

provide an environment in which preexisting mutants survive.

- D. increase the rate of spontaneous mutation.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

21. Prokaryotic cell mutations can be observed very quickly because the prokaryotic chromosome is

- A. diploid.
- B. polyploid.
- C. haploid.
- D. polysomal.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.01

Section: 08.01

Topic: Genetics

22. The diploid character of eukaryotic cells may mask the appearance of a mutation since

A.

this may be a frameshift.

B. the mutation is often reversible.

C.

the mutation may create inverted repeats.

D. the matching chromosome may carry the dominant gene.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.01

Section: 08.01

Topic: Genetics

23. Direct selection involves inoculating cells onto growth media on which

A. the mutant but not the parental cell type will grow.

B. the mutation will be reversed.

C. the nutrients necessary for mutation to occur are present.

D. the mutagen is present.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

24. Among the easiest of the mutations to isolate are those which

- A. involve haploid chromosomes.
- B. involve antibiotic resistance.
- C. allow populations to be measured.
- D. use an indirect method for measurement.
- E. involve haploid chromosomes AND involve antibiotic resistance.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

25. Indirect selection

- A. is necessary to isolate auxotrophic mutants.**
- B. uses media on which the mutant but not the parental cell type will grow.
- C. uses media that reverses the mutation.
- D. uses media upon which neither the parental cell type or mutant grows.
- E. is necessary to isolate auxotrophic mutants AND uses media upon which neither the parental cell type or mutant grows.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

26. Replica plating

- A. is useful for direct selection.
- B. is useful for identifying auxotrophs.
- C. uses media on which the mutant will not grow and the parental cell type will.
- D. is used to store strains of bacteria.
- E. is useful for identifying auxotrophs AND uses media on which the mutant will not grow and the parental cell type will.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

27. A clever technique that streamlines the identification of auxotrophic mutants is

- A. gas chromatography.
- B. replica plating.**
- C. direct selection.
- D. reversion.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

28.

To increase the proportion of auxotrophic mutants in a population of bacteria, one may use

- A. direct selection.
- B. replica plating.
- C. penicillin enrichment.**
- D. individual transfer.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.12

Section: 08.05

Topic: Genetics

29. A quick microbiological test for potential carcinogens was developed by

- A. Fleming.
- B. Lederberg.
- C. Ames.**
- D. Crick.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.13

Section: 08.05

Topic: Genetics

Chapter 08 - Bacterial Genetics

30.

To increase the chance of detecting carcinogens in the Ames test, the test substance is treated with

A. penicillin.

B. heat.

C.

ground-up rat liver.

D. reverse transcriptase.

E. penicillin AND heat.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.13

Section: 08.05

Topic: Genetics

31. The Ames test is useful as a rapid screening test to identify those compounds that

A. will respond to chemical agents.

B. are mutagens.

C. respond to the deletion of DNases.

D. will protect an organism from cancer.

E. will respond to chemical agents AND will protect an organism from cancer.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.13

Section: 08.05

Topic: Genetics

32. Bacteria that have properties of both the donor and recipient cells are the result of
- A. UV light.
 - B. SOS repair.
 - C. frame shift mutations.
 - D.** genetic recombination.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.14

Section: 08.06

Topic: Genetics

33. The mechanism by which genes are transferred into bacteria via viruses is called
- A. ellipsis.
 - B. replica plating.
 - C. transformation.
 - D.** transduction.
 - E. conjugation.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.15

Section: 08.07

Topic: Genetics

34. In conjugation the donor cell is recognized by the presence of
- A.** an F plasmid.
 - B. a Y chromosome.
 - C. diploid chromosomes.
 - D. an SOS response.
 - E. an F plasmid AND diploid chromosomes.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.16

Section: 08.08

Topic: Genetics

35. The F plasmid carries the information for
- A. antibiotic resistance.
 - B. recipient cell DNA replication.
 - C. the Y chromosome.
 - D.** the sex pilus.
 - E. antibiotic resistance AND the Y chromosome.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.16

Section: 08.08

Topic: Genetics

36. Competent cells
- A. are able to take up naked DNA.
 - B. are antibiotic resistant.
 - C. occur naturally.
 - D. can be created in the laboratory.
 - E.**

are able to take up naked DNA, occur naturally, AND can be created in the laboratory.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

Bloom's Level: 2. Understand

Bloom's Level: 4. Analyze

Learning Outcome: 08.14

Section: 08.06

Topic: Genetics

37. The material responsible for transformation was shown to be DNA by

A. Watson and Crick.

B.

Avery, MacLeod, and McCarty.

C. Lederberg.

D. Stanley.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.14

Section: 08.06

Topic: Genetics

38. In conjugation, transformation, or transduction, the recipient bacteria is most likely to accept donor DNA

A. from any source.

B. from any species of bacteria.

C. from the same species of bacteria.

D. only through plasmids.

E. from any source AND only through plasmids.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.14

Section: 08.06

Topic: Genetics

39. Gene transfer that requires cell-to-cell contact is

A. transformation.

B. competency.

C. conjugation.

D. functional genomics.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.16

Section: 08.08

Topic: Genetics

40. Insertion sequences

- A. are the simplest type of transposon.
- B. code for a transposase enzyme.
- C. are characterized by an inverted repeat.
- D. can produce pili.
- E.**

are the simplest type of transposon, code for a transposase enzyme, AND are characterized by an inverted repeat.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.18

Section: 08.09

Topic: Genetics

41. The transfer of vancomycin resistance from *Enterococcus faecalis* to *Staphylococcus aureus* is thought to have involved

- A. conjugation.
- B. transformation.
- C. transduction.
- D. transposons.
- E.** conjugation AND transposons.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.18

Section: 08.09

Topic: Genetics

42. Which is not true about a crown gall tumor?

- A. It is a bacterial infection of plants.
- B. It requires a plasmid.
- C. It produces a large amount of opines that neither the plant nor bacteria synthesizes.
- D. It is due to the incorporation of bacterial plasmid DNA into the plant chromosome.
- E.** All of the choices are true.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.17

Section: 08.09

Topic: Genetics

43. The study of the crown gall tumor found

- A.** a bacterial plasmid promoter that was similar to plant promoters.
- B. an R plasmid.
- C. incorporation of the bacterial chromosome into the plant.
- D. incorporation of the plant chromosome into the bacteria.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.17

Section: 08.09

Topic: Genetics

True / False Questions

44. Organisms termed *his⁻* are considered prototrophic for histidine.

FALSE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.02

Section: 08.01

Topic: Genetics

45. Each gene mutates at a characteristic frequency.

TRUE

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 08.03

Section: 08.02

Topic: Genetics

46. DNA polymerase is able to proofread the DNA sequence.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 08.09

Section: 08.04

Topic: Genetics

47. Mutations are likely to persist after SOS repair, but not after light-induced or excision repair.

TRUE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.11

Section: 08.04

Topic: Genetics

48. The Ames test determines antibiotic sensitivity of a bacterium.

FALSE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.13

Section: 08.05

Topic: Genetics

49. Double-stranded DNA enters the recipient cell during transformation.

FALSE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.15

Section: 08.07

Topic: Genetics

50. Plasmids often carry the information for antibiotic resistance.

TRUE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.17

Section: 08.09

Topic: Genetics

51. F plasmids and oftentimes R plasmids are both able to code for production of a pilus.

TRUE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.17

Section: 08.09

Topic: Genetics

52. Transposons may leave a cell by incorporating themselves into a plasmid.

TRUE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.18

Section: 08.09

Topic: Genetics

53. Crown gall is caused by a prokaryote plasmid that can be expressed in plant cells.

TRUE

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 08.17

Section: 08.09

Topic: Genetics

Multiple Choice Questions

54.

Is it as effective to take two antibiotics sequentially for an infection as it is to take them simultaneously, so long as the total length of time of the treatment is the same?

A. No. There's always one specific antibiotic that will be the most effective, and that is the only antibiotic that should be used to treat a particular infection.

B.

Yes. So long as the length of time is the same, the two treatments should be essentially the same in terms of effectively eliminating the infection.

C. No. Taken sequentially, the first antibiotic will select for the small portion of the population that will spontaneously mutate towards resistance. Then, the second antibiotic will do the exact same thing-selecting for resistance to the second drug from the few bacterial cells that remained from the first drug treatment.

D. It depends. Provided that the majority of the infectious agent is killed off by the first drug, the likelihood that the few that are left would not also be killed by the second drug is low. However, simultaneous treatment should be more effective at eliminating all the microbes in the shortest time possible, and with the least probability of selection for multiple drug resistance mutations.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.03

Section: 08.02

Topic: Genetics

55. Strong chemical mutagens may be used to treat cancer cells. Is this a good or bad idea?
- A. Good-kill those cancer cells as quickly as possible to cure the patient!
 - B. Bad-these mutagens will also affect the non-cancerous cells, possibly leading to new cancerous states!
 - C. Good and bad-they're very good at killing cancer cells, but depending on mode of administration, they could also be dangerous to non-cancerous cells.
 - D. Bad-the cancer cells are already mutated. We don't want to mutate them more and make them more cancerous!

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 08.06

Section: 08.03

Topic: Genetics

56. Every 24 hours, every genome in every cell of the human body is damaged 10,000 times or more. Given the possible DNA repair mechanisms, which order listed below would be most effective at repairing these as quickly as possible in order to prevent mutations from being carried forward in DNA replication?

A.

Proofreading by DNA polymerase, glycosylase enzyme activities, excision repair, SOS repair

B.

SOS repair, excision repair, glycosylase enzyme activities, proofreading by DNA polymerase

C.

SOS repair, proofreading by DNA polymerase, glycosylase enzyme activities, excision repair

D.

Glycosylase enzyme activities, SOS repair, proofreading by DNA polymerase, excision repair

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 08.11

Section: 08.04

Topic: Genetics

57.

To maximize the number of thymine dimer mutations following UV exposure, should you keep human cells in tissue culture in the dark, in the light, or does it matter at all?

- A. The dark-light will activate the photorepair systems that can break thymine dimers induced by UV light.
- B. The light-it's important to keep on producing the thymine dimers by keeping the plate exposed to light as much as possible.
- C.

It's best to alternate light and dark every hour to increase the chances that thymine dimers will form in the human cells, but still keep the photorepair systems from correcting them as they are formed.

D.

It doesn't matter-human cells don't possess the enzymes needed for photorepair of thymine dimers.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 08.11

Section: 08.04

Topic: Genetics

58. Two bacterial genes are transduced simultaneously. What does this suggest about their proximity to each other within the original host genome?

A.

Not a thing-it's highly likely that two separate virus particles were carrying each gene, and that they coinfecting the new target cell at the same time, delivering their genetic payloads. This could mean the two original genes might not even be from the same original host cell!

B.

It's highly likely that the two genes are located next to each other in the original host cell chromosome. Since transduction relies on either mispackaging of bits of host cell DNA into non-functional virus units, or improper excision of lysogenic phage DNA from a host cell chromosome (carrying parts of the host cell DNA with it), the genes must lie close to each other to be transduced into a new cell simultaneously.

C.

They must be within five gene lengths of each other, but not necessarily immediately adjacent. If they were immediately adjacent, the transposons that facilitate the transfer of genetic information between the two cells wouldn't be able to 'jump' into them.

D.

It doesn't mean anything. Transduction relies on the ability of a cell to take up foreign DNA. It's possible here that the cell has simply taken up two separate bits of DNA at the same time from the surrounding environment.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 08.15

Section: 08.07

Topic: Genetics

59. DNA transfer by conjugation is more efficient in a liquid medium setting, subjected to very mild agitation (stirring), rather than on an agar plate format. Why?

A. Direct cell-to-cell contact is required for this process, and this is more likely to be achieved in the plate format than in the fluid format (especially for relatively non-motile types of bacteria).

B. Direct cell-to-cell contact isn't required for this process, so the ability to secrete the DNA into the surrounding fluid medium makes the process more efficient than the dry surface of an agar plate.

C. Direct cell-to-cell contact is required for this process, and this is more likely to be achieved in the fluid liquid format than on an agar plate (especially for relatively non-motile types of bacteria).

D. Trick question-it can take place with the same degree of efficiency on either format. It doesn't matter!

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 08.16

Section: 08.08

Topic: Genetics

60. Some bacteria have a higher incidence rate of thymine dimer mutations following exposure to UV light than others. What might be going on here to lead to this outcome?

A. They may simply have a higher proportion of T nucleotides next to each other in their DNA sequences than other bacteria, leading to more possible dimers being formed.

B. They may have a stronger expression of photoreactivation enzymes, leading to more thymine dimers being formed and retained.

C. They may have a weaker expression of photoreactivation enzymes, leading to more thymine dimers being formed and retained.

D. They may simply have a higher proportion of T nucleotides next to each other in their DNA sequences than other bacteria, leading to more possible dimers being formed AND they may have a stronger expression of photoreactivation enzymes, leading to more thymine dimers being formed and retained.

E. They may simply have a higher proportion of T nucleotides next to each other in their DNA sequences than other bacteria, leading to more possible dimers being formed AND they may have a weaker expression of photoreactivation enzymes, leading to more thymine dimers being formed and retained.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 08.11

Section: 08.04

Topic: Genetics

Chapter 09 Biotechnology and Recombinant DNA

Multiple Choice Questions

1. Short tandem repeats (STRs)

A.

are useful in identifying specific individuals.

B.

are important sites in vectors where foreign DNA can be integrated.

C.

are errors that can arise during DNA sequencing.

D.

are DNA fragments generated during PCR.

ASM Objective: 07.04 Ability to understand the relationship between science and society: Identify and discuss ethical issues in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

Chapter 09 - Biotechnology and Recombinant DNA

2. Mitochondrial DNA (mtDNA) in humans

A.

is always donated to the offspring from both parents.

B.

can be used to identify related people.

C.

can be isolated only from intact embryos.

D.

can be used to establish paternity.

ASM Objective: 01.01 Cells, organelles (e.g. mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

3. DNA molecules that contain pieces of DNA from two different sources are defined as

A. biotechnology.

B. gene cloning.

C. recombinant DNA.

D. genetic engineering.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

Chapter 09 - Biotechnology and Recombinant DNA

4.

Common vectors used for cloning genes are

- A. bacteria.
- B. viruses.
- C. nucleotides.
- D. plasmids.
- E.**

viruses AND plasmids.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

5.

The molecules used as molecular scissors in genetic engineering are

- A. exonucleases.
- B. proteases.
- C.** restriction enzymes.
- D.

RNA polymerases.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

6. Digestion of DNA by restriction enzymes

- A. produces sticky ends.
- B. produces blunt ends.
- C. cuts both strands of the DNA molecule.
- D. generates restriction fragments.
- E.** All of the choices are correct.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

7. Restriction enzymes have proved so useful in manipulating DNA because

- A. they cut at defined sites.
- B. the sticky ends make it very easy to allow recombination of any type of DNA.
- C. they protect eukaryotes against virus attack.
- D. they cut RNA molecules.
- E.** they cut at defined sites AND the sticky ends make it very easy to allow recombination of any type of DNA.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

8. The molecule(s) that act as molecular glue to bind DNA fragments together is/are

- A. DNase.
- B.** DNA ligase.
- C. ligandase.
- D. polymerase.
- E. DNase AND ligandase.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

9. Agarose gel electrophoresis separates nucleic acid fragments according to

- A. density.
- B. shape.
- C. size.**
- D. sequence.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

10. A dye often used for its ease and sensitivity to visualize nucleic acid after agarose gel electrophoresis is

- A. nigrosin.
- B. malachite green.
- C. gold oxide.
- D. ethidium bromide.**

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

11. The energy to separate fragments during agarose gel electrophoresis is supplied by

- A. gravity.
- B. active transport.
- C. agarosis.
- D. electricity.**

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

Chapter 09 - Biotechnology and Recombinant DNA

12. The agarose used in electrophoresis

- A. interacts electrically with the DNA.
- B. chemically binds to the DNA.
- C. acts as a sieve.
- D. selectively sorts recombinant DNA from host DNA.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

13. The gene for human insulin has been successfully cloned in

- A. *S. aureus*.
- B. *E. coli*.
- C. rhinovirus.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

14. Genetic engineering

- A. allows the use of bacteria as production factories for a number of molecules.
- B. relies on recombinant DNA technology.
- C. is dependent on RNA enzymes.
- D. relies completely on conjugation.
- E. allows the use of bacteria as production factories for a number of molecules AND relies on recombinant DNA technology.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 3. Apply

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

15. Genetic engineering of plants has so far produced

A.

pest-resistant plants.

B. plants that are herbicide resistant.

C. plants with increased nutritional value.

D. All of the choices are correct.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

16. The entire set of cloned fragments of the complete human genome is termed a

A. book of genes.

B. recombinant gene.

C. DNA library.

D. restructured genome.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

Bloom's Level: 1. Remember

Bloom's Level: 4. Analyze

Learning Outcome: 09.03

Section: 09.03

Topic: Biotechnology

17. An ideal vector

A. may be a plasmid or bacteriophage.

B. has a restriction enzyme recognition site.

C. contains an origin of replication.

D. contains a selectable marker.

E. All of the choices are correct.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 09.05

Section: 09.03

Topic: Biotechnology

18. Host cells containing recombinant DNA can be selected on the basis of the properties of the

- A. vector.
- B. ribosomes.
- C. enzymes.
- D. virus.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.06

Section: 09.03

Topic: Biotechnology

19. Selecting for transformants involves

- A. identifying organisms that have taken up recombinant DNA.
- B. searching for RNA.
- C. production of proteins.
- D. production of DNA.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.06

Section: 09.03

Topic: Biotechnology

20. Laboratory strains of *E. coli* are desirable hosts because

- A. it is easy to grow.
- B. its genetics is well known.
- C. it is especially able to express foreign genes.
- D. it has known phenotypic characteristics.
- E. All of the choices are correct.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.06

Section: 09.03

Topic: Biotechnology

21. A danger in using *E. coli* in cloning is that

- A. *E. coli* could cause disease.
- B. the human cells may reject the insertion.
- C. the exons may invert the introns.
- D.**

the outer membrane is toxic to humans.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 4. Analyze

Section: 09.04

Topic: Biotechnology

22. When a vector that employs the *lacZ* gene as a second marker is used in a cloning experiment, bacteria that harbor the recombinant DNA will give rise to

- A. red colonies.
- B.** white colonies.
- C. blue colonies.
- D. All of the choices are correct.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 09.06

Section: 09.03

Topic: Biotechnology

23. Goal(s) of gene cloning may be to produce

- A. a protein.
- B. many copies of the gene to be used as a probe.
- C. many copies of the gene for sequencing.
- D. more copies of the host cell.
- E.**

a protein, many copies of the gene to be used as a probe, AND many copies of the gene for sequencing.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

24. In order to get around the lack of ability of prokaryotes to remove introns from precursor RNA, it may be necessary to

- A. use the DNA directly.
- B. use the DNA after it has been processed.
- C. use different promoters.
- D.** turn mRNA into cDNA.
- E. use the DNA directly AND use the DNA after it has been processed.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 09.04

Section: 09.03

Topic: Biotechnology

25. Which of the following genera has proved useful for manipulating plant cells?

- A. *Escherichia*
- B. *Bacillus*
- C. *Pseudomonas*
- D.** *Agrobacterium*

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

26. The Ti plasmid is naturally found in

- A. *E. coli*.
- B. *Pseudomonas*.
- C. *Agrobacterium*.
- D. *Staphylococcus*.
- E. *E. coli* AND *Staphylococcus*.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

27. The Ti plasmid is used as a vector to transfer DNA into

- A. viruses.
- B. bacteria.
- C. plant cells.
- D. animal cells.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

28. Genetically modified food has raised some concerns because

- A. it contains radioactive particles.
- B. it may contain some unanticipated allergens.
- C. it may have some unintended environmental effects.
- D. the modified DNA may transfer to other organisms.
- E.

it may contain some unanticipated allergens, it may have some unintended environmental effects, AND the modified DNA may transfer to other organisms.

ASM Objective: 07.04 Ability to understand the relationship between science and society: Identify and discuss ethical issues in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 09.07

Section: 09.04

Topic: Biotechnology

Chapter 09 - Biotechnology and Recombinant DNA

29.

The current cost of sequencing a human genome is

A.

about \$10

B.

about \$1,000

C.

about \$1,000,000

D.

over \$400,000,000

ASM Objective: 07.04 Ability to understand the relationship between science and society: Identify and discuss ethical issues in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 09.08

Section: 09.05

Topic: Biotechnology

30. Knowing the sequence of a genome is useful in

A. identifying genetic alterations associated with disease.

B. studying evolutionary relationships.

C. determining protein sequences.

D. All of the choices are correct.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.08

Section: 09.05

Topic: Biotechnology

31. Dideoxynucleotides

- A. are useful in nucleic acid sequencing.
- B. have two additional hydroxyl groups at the 2' and 3' carbons.
- C. act as chain initiators.
- D. act as chain terminators.
- E. are useful in nucleic acid sequencing AND act as chain terminators.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.09

Section: 09.05

Topic: Biotechnology

32. The polymerase chain reaction is used to duplicate small sections of

- A. DNA.
- B. RNA.
- C. proteins.
- D. lipids.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 09.10

Section: 09.06

Topic: Biotechnology

33. The polymerase chain reaction is used to

- A. amplify certain sections of DNA.
- B. amplify mRNA.
- C. produce proteins.
- D. produce long polymers of carbohydrates to be used in electrophoresis.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

34. PCR is particularly useful in
- A. detecting viable yet non-culturable organisms.
 - B. assessing impure (multiple types of bacteria present) samples.
 - C. dealing with very small numbers of bacteria.
 - D. relatively quickly producing results.
 - E.** All of the choices are correct.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.10

Section: 09.06

Topic: Biotechnology

35. Double-stranded DNA will separate into two strands when exposed to
- A. high temperature.
 - B. high pH.
 - C. low temperature.
 - D. low salt.
 - E.** high temperature AND high pH.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

36. Starting with a single piece of dsDNA, after 3 PCR cycles there are
- A. 2 additional pieces of dsDNA.
 - B. 4 additional pieces of dsDNA.
 - C.** 8 additional pieces of dsDNA.
 - D. 16 additional pieces of dsDNA.

ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical and graphing skills and reasoning to solve problems in microbiology.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

37. *Taq* polymerase is

A. a reverse transcriptase.

B. an RNA polymerase.

C. from *E. coli*.

D.

a heat-stable DNA polymerase from *Thermus aquaticus*.

E. an RNA polymerase AND from *E. coli*.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

38. PCR produces

A. DNA fragments of all possible sizes.

B. DNA fragments that are one nucleotide larger than the next fragment.

C. DNA fragments of a particular size.

D. DNA fragments of increasing size.

E. DNA fragments that are one nucleotide larger than the next fragment AND DNA fragments of increasing size.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

39. The size of the amplified DNA fragment generated during PCR is determined by

A. how many cycles are performed.

B. the size of the template DNA.

C. the location to which the primers anneal.

D. how much *Taq* is used.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

40. DNA probes

- A. may be obtained from denatured tagged dsDNA.
- B. may be obtained from similar genes from another organism.
- C. may be synthesized usually using information based on the protein sequence.
- D. are usually tagged dsRNA.
- E.**

may be obtained from denatured tagged dsDNA, may be obtained from similar genes from another organism, AND may be synthesized usually using information based on the protein sequence.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

41. A common way to identify the *E. coli* that carries the desired recombinant DNA is by using a

- A. vector.
- B.** probe.
- C. host.
- D. plasmid.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

42. DNA microarray technology

- A. may use many DNA fragments that function like probes.
- B. attaches nucleotides to a solid support such as a glass slide.
- C. relies on arrays that contain a detectable tag.
- D. uses nucleic acid hybridization.

E.

may use many DNA fragments that function like probes, attaches nucleotides to a solid support such as a glass slide, AND uses nucleic acid hybridization.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

43. Fluorescence *in situ* hybridization (FISH)

- A. uses virus hosts.
- B. uses a labeled probe.
- C. is useful in microbial ecology.
- D. allows identification of particular bacterial groups in mixed samples.

E.

uses a labeled probe, is useful in microbial ecology, AND allows identification of particular bacterial groups in mixed samples.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

True / False Questions

44. Agarose gel electrophoresis may be considered as a partial purification technique.

TRUE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

45. Most eukaryotic genes are cloned directly into the vector for expression in prokaryotes.

FALSE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.02

Section: 09.02

Topic: Biotechnology

46. PCR is useful for amplifying a particular section of DNA.

TRUE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

47. PCR typically results in the generation of fragments of all sizes.

FALSE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.11

Section: 09.06

Topic: Biotechnology

48. Vectors must have at least one restriction enzyme recognition site.

TRUE

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 09.05

Section: 09.03

Topic: Biotechnology

49. A very common vector is a plasmid.

TRUE

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 09.05

Section: 09.03

Topic: Biotechnology

50. When using *lacZ* containing vectors, colonies containing intact vector turn blue.

TRUE

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 3. Apply

Learning Outcome: 09.06

Section: 09.03

Topic: Biotechnology

51. DNA probes are used to find regions of complementary DNA.

TRUE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

52. FISH uses labeled probes to detect specific whole cells.

TRUE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

53. A DNA microarray contains oligonucleotides that contain a label.

TRUE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

Multiple Choice Questions

54. Possessing the entire sequence of a particular human genome may not be as useful as we think. Why not?

A. Every human genome is different enough that knowing ONE human's DNA sequence can't tell us almost anything about ALL humans.

B. It's not the DNA sequence that matters-we need to know the mRNA sequence of the human genome.

C. Due to the presence of introns/exons, and splicing of RNA after transcription, the DNA sequence doesn't necessarily tell us the exact number/type of proteins that will eventually be made from it.

D.

The amount of "junk DNA" present in the human genome masks any useful genetic information that we'd like to obtain.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 09.08

Section: 09.05

Topic: Biotechnology

55.

Polymerase chain reaction (PCR) can be used to perform DNA sequencing reactions. In this case, are two primers (a forward and a reverse) necessary?

A.

Yes-you can't perform PCR without two specific primers to amplify the region in question in the DNA.

B. No-dideoxynucleotide sequencing depends on different length fragments being formed and then separated based on size. This can take place with only a specific forward OR a specific reverse primer.

C.

No-you actually need a primer pair for each round of DNA amplification ... so you'll need many, many primer pairs.

D. Yes-and it will be important to make sure that the primer pairs are made with dideoxynucleotides that are labeled with fluorescent dyes. Otherwise, you won't be able to detect the fragments that are made in the PCR process.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.09

Section: 09.05

Topic: Biotechnology

56. In a FISH experiment, what would happen if unbound probe was not washed off?

A. Nothing-it's not necessary to wash off the unbound probe.

B.

You would get false-positive results in different areas where the probe hadn't actually bound, but it was still sitting there and lighting up.

C. Your FISH would be floating at the top of the tank due to the toxicity of the probe building up within them.

D. Nothing-the target nucleotide sequences are labeled, not the probe. Therefore, excess unbound probe wouldn't matter for the experiment.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 09.12

Section: 09.07

Topic: Biotechnology

57. A graduate student wants to clone a particular gene into a plasmid. The sequence includes AluI and BamHI sites on both sides of the desired fragment. AluI cuts symmetrically directly between the G and C nucleotides in a palindromic 5' AGCT 3' sequence. BamHI cuts asymmetrically directly between the G and G nucleotides in a palindromic 5' GGATCC 3' sequence. Which of the two restriction endonucleases should the graduate student choose, and why?

A. BamHI to cut both sides-since it cuts asymmetrically, it'll leave the sticky, cohesive single-strand DNA ends that will make it easier to ligate into a BamHI-cut plasmid DNA sequence.

B. AluI to cut both sides-it's always easier to ligate together blunt ends of DNA. She should also use AluI on the plasmid she wants to put the fragment into.

C. BamHI on the fragment, and AluI on the plasmid-this will give her the matching sequences to anneal/ligate together on the fragment/plasmid combination.

D. BamHI on one side of the fragment, and AluI on the other side-this would keep the fragment from sticking right back to where it was cut out from in the original DNA.

ASM Objective: 04.05 Cell genomes can be manipulated to alter cell function.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 09.01

Section: 09.01

Topic: Biotechnology

Chapter 10 Identification and Classification of Prokaryotic Organisms

Multiple Choice Questions

1. An early attempt by Cohn at bacterial classification grouped bacteria according to their
- A. biochemistry.
 - B. Gram stain.
 - C. shape.
 - D. arrangement.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: History of Microbiology

2. In 1908 Orla-Jensen suggested that bacteria be grouped according to their
- A. arrangement.
 - B. morphology.
 - C. physiology.
 - D. Gram stain.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: History of Microbiology

3. In the 1930s Kluver and van Niel proposed a classification scheme based on
- A. Gram reactions.
 - B. biochemical relationships.
 - C.** presumed evolutionary relationships.
 - D. DNA sequences.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: History of Microbiology

4. In 1970 Stanier proposed that classification be based on
- A. evolution.
 - B. Gram stain.
 - C. physiology.
 - D.** DNA sequence.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: History of Microbiology

5. Woese
- A. was involved in determining rRNA sequences.
 - B. proposed breaking prokaryotes into two groups.
 - C.

proposed breaking eukaryotes into Domains Archaea and Bacteria.

- D. was involved in refining the Gram stain for classification purposes.
- E.** was involved in determining rRNA sequences AND proposed breaking prokaryotes into two groups.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: History of Microbiology

Chapter 10 - Identification and Classification of Prokaryotic Organisms

6. Which technique(s) is/are used to help identify and classify bacteria?

A.

Microscopic examination

B.

Culture characteristics

C.

Biochemical tests

D.

Nucleic acid analysis

E. All of the choices are correct.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

7. In higher organisms, successful mating can occur between members of the same

A. genus.

B. species.

C. class.

D. order.

ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes, due to asexual reproduction and the frequent occurrence of horizontal gene transfer.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Eukaryotes

Chapter 10 - Identification and Classification of Prokaryotic Organisms

8. From most general to most specific, which is the correct order?

A.

Phylum, class, kingdom, order, family, genus, species

B.

Kingdom, phylum, class, order, family, genus, species

C.

Kingdom, phylum, family, class, order, genus, species

D.

Kingdom, order, family, genus, phylum, class, species

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

9. The basic taxonomic unit in the classification scheme of plants and animals is

A. kingdom.

B. class.

C. order.

D. genus.

E. species.

ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes, due to asexual reproduction and the frequent occurrence of horizontal gene transfer.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 10 - Identification and Classification of Prokaryotic Organisms

10. The three domain classification scheme uses

- A. order, phylum, class.
- B. plants, animals, bacteria.
- C.

Protista, Prokaryotae, Fungi.

D.

Archaea, Bacteria, Eukarya.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

11. The reference for taxonomic descriptions of bacteria is

- A. *Gray's Anatomy*.
- B. *Websters Manual of Taxonomic Bacteriology*.
- C. *Bergey's Manual of Systematic Bacteriology*.**
- D. *Bacteriology*.

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

12. The name *Lactococcus (Streptococcus) lactis*
- A. indicates that the subgenus is Streptococcus.
 - B. indicates that the family is Lactococcus.
 - C. indicates that *Streptococcus* is the old genus name.
 - D. indicates that *Lactococcus* is the old class name.

ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes, due to asexual reproduction and the frequent occurrence of horizontal gene transfer.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

13. Very often clinically relevant information may be obtained by examining
- A. a wet mount.
 - B. the size and shape of the organism.
 - C. the sequence of proteins.
 - D. the transformation ability.
 - E. a wet mount AND the size and shape of the organism.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

14. Gram-positive encapsulated diplococci found in sputum is indicative of
- A. *E. coli*.
 - B. *Pseudomonas*.
 - C. *Streptococcus pneumoniae*.
 - D. *Neisseria gonorrhea*.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

15. Intracellular Gram-negative diplococci found in a urethral sample from a male is indicative of

- A. *E. coli*.
- B. *Pseudomonas*.
- C. *Streptococcus pneumoniae*.
- D.

Neisseria gonorrhoeae.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

16. *Mycobacterium tuberculosis* is one of the few species of bacteria that

- A. are encapsulated.
- B. stain Gram-negative.
- C. are acid fast.
- D. stain Gram-positive.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

17. A soluble greenish pigment is produced by

- A. *Serratia marcescens*.
- B. *E. coli*.
- C. *Pseudomonas aeruginosa*.
- D. streptococci.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 10 - Identification and Classification of Prokaryotic Organisms

18. A selective growth medium

- A. allows only certain bacteria to grow.
- B. allows all bacteria to grow.
- C. allows no bacteria to grow.
- D. accentuates differences between the growing bacteria.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

19. *Streptococcus pyogenes* would be

- A. beta hemolytic and catalase negative.
- B. beta hemolytic and catalase positive.
- C. alpha hemolytic and catalase negative.
- D. alpha hemolytic and catalase positive.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

20. Media that changes color as a result of the biochemical activity of growing bacteria

- A. usually contain a pH indicator in the media.
- B. usually contain blood.
- C. usually require the addition of various reagents before the color is evident.
- D. is due to a breakdown of a colorless reagent.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

21. A breath test assaying for radioactive carbon dioxide may be used to indicate the presence of

- A. *E. coli*.
- B. *Pseudomonas*.
- C. *Streptococcus pyogenes*.
- D.** *Helicobacter pylori*.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

22.

API™, Enterotube™, and Vitek™ are all

- A. methods for extracting DNA from bacteria.
- B. used to measure gas production.
- C.** commercially available methods used to identify bacteria.
- D. used to show the presence of bacteria in a sample.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

23. Serological methods

A.

are useful in identifying bacteria.

B. rely on the specificity of an antibody-antigen interaction.

C. may be simple and rapid.

D. All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

24. Fatty acid analysis

A. can be used to identify Gram-negative bacteria.

B. can be used to identify Gram-positive bacteria.

C. uses gas chromatography to analyze fatty acid methyl esters.

D. requires that cells be grown under standardized conditions.

E.

All of these choices are correct.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

25. Nucleic acid techniques have great power as diagnostic tools because they may be
- A. very specific.
 - B. quick and easy to perform.
 - C. used to enhance the growth of bacteria.
 - D. used to selectively inhibit the growth of certain bacteria.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

26. DNA probes have been very useful in
- A.

coding the DNA of organisms grown in vivo.

- B. identifying organisms in pure culture.
- C. detecting toxins.
- D. diagnosing diseases of protozoa.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 10 - Identification and Classification of Prokaryotic Organisms

27.

Organisms that grow very slowly, are non-curable, are present in very small numbers, or are mixed with a number of other bacteria may still be identified using

- A. Southern blotting.
- B. replica plating.
- C. PCR.**
- D. gas chromatography of fatty acids.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

28. Which of the rRNA molecules has proven the most useful in taxonomy/identification?

- A. 5S
- B. 16S**
- C. 23S
- D. 80S

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

29. Two isolates with identical RFLPs are considered

- A. the same strain.
- B. different strains.
- C. possibly the same strain.**
- D. different genera.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

30. Strain differences are helpful in

- A. replica plating.
- B. electrophoresis.
- C. transformation.
- D. transduction.
- E. tracing the source of outbreaks of disease.**

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

31. Various strains of *E. coli*

- A. may cause disease.
- B. may be harmless.
- C. are all exactly the same.
- D. are all very different from one another.
- E. may cause disease AND may be harmless.**

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

32. *E. coli* 0157:H7

- A. is Gram-positive.
- B. is a normal constituent of the intestinal tract.
- C. does not ferment sorbitol.
- D. produces a toxin.
- E. does not ferment sorbitol AND produces a toxin.**

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

33. In *E. coli* O157:H7, the O157:H7 refers to the

- A. specific type of DNA present.
- B. specific genus.
- C. general family.
- D. the specific LPS and flagella type present.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

34. Phenotypically identical bacteria

- A. look the same.
- B. are genetically exactly the same.
- C. may be told apart by DNA sequence analysis.
- D. may not be told apart by any means.
- E. look the same AND may be told apart by DNA sequence analysis.**

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

35. Phage typing

- A. is useful for determining eukaryotic cell types.
- B. is used to extract DNA from cells.
- C. is used to distinguish bacterial strains.**
- D. is dependent on the type of eukaryotic cell.
- E. is used to distinguish bacterial strains AND is dependent on the type of eukaryotic cell.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

36. The more closely related two organisms are,

- A. the less they look alike.
- B. the more similar the nucleic acid sequence.**
- C. the less similar the nucleic acid sequence.
- D. the more they are phenotypically similar.
- E. the more similar the nucleic acid sequence AND the more they are phenotypically similar.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

37. The point at which two organisms diverged from a common ancestor

- A. can be determined by comparing the nucleic acid sequences.**
- B. depends on translational control.
- C. depends on metabolism.
- D.

is determined on MacConkey's media.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

38. The ticks of a genetic clock are measured by the

- A. number of random mutations.**
- B. number of dead cells.
- C. amount of RNA.
- D. amount of DNA.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

39. Modern approaches to evolutionary taxonomy often involve

- A. biochemical differences.
- B. comparison of DNA and RNA.**
- C. protein similarities.
- D. lactose fermentation.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

40.

The relatedness of organisms determined by counting common characteristics

A.

is called evolutionary taxonomy.

B.

is called amino acid sequences.

C.

is called DNA sequences.

D.

is called numerical taxonomy.

E. suggests the organisms are very closely related at the species level AND means the GC content is 45%.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 10 - Identification and Classification of Prokaryotic Organisms

41.

To study the phylogeny of eukaryotes,

A. 16S rRNA is used.

B. 18S rRNA is used.

C.

40S rRNA is used.

D. 80S rRNA is used.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

42. Sequencing of rRNA is useful for

A. determining evolutionary relationships.

B. determining protein sequences.

C. identification of unknown bacteria.

D. serological relationships.

E. determining evolutionary relationships AND identification of unknown bacteria.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

43. Disagreements between conclusions obtained from rDNA data and other techniques may be explained by

- A. horizontal DNA transfer.
- B. vertical DNA transfer.
- C. the difference in translation machinery.
- D. vertical RNA transfer.

ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes, due to asexual reproduction and the frequent occurrence of horizontal gene transfer.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

44.

If the GC content of two organisms is 45% in both,

- A. they are definitely related.
- B. they are definitely not related.
- C. they may or may not be related.
- D. the AT content is 65%.
- E. they are definitely related AND the AT content is 65%.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

45. A DNA similarity of 75% between two organisms

- A. suggests the organisms are very closely related at the species level.
- B. suggests the organisms are not related.
- C. suggests the organisms may or may not be related.
- D. means the GC content is 45%.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

46. Phylogenetic relationships between prokaryotes are most accurately determined using
- A. phenotypic characterizations.
 - B. genotypic information.**
 - C. the fossil record.
 - D. carbon dating.
 - E. phenotypic characterizations AND genotypic information.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

True / False Questions

47.

The three domain systems consist of Archaea, Bacteria, and Eukarya.

TRUE

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

48. All known species of bacteria are described in *Bergey's Manual of Systematic Bacteriology*.

TRUE

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

49. Size and shape may allow one to differentiate between a bacterium, fungus, or protozoan.

TRUE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

50. *Serratia marcescens* are red when incubated at 37°C.

FALSE

ASM Objective: 04.03 The regulation of gene expression is influenced by external and internal molecular cues and/or signals.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

51. *Streptococcus pyogenes* can be easily distinguished microscopically from other *Streptococcus* species.

FALSE

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

52. Based on DNA hybridization, humans and chimpanzees are the same species.

TRUE

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

53. rRNA sequence comparisons are useful for determining evolutionary relationships.

TRUE

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

54. If each of two bacteria have a %GC of 50%, this means that they are both definitely closely related.

FALSE

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

55. Horizontal DNA transfer may make it more difficult to construct phylogenetic trees.

TRUE

ASM Objective: 01.04 The traditional concept of species is not readily applicable to microbes, due to asexual reproduction and the frequent occurrence of horizontal gene transfer.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Multiple Choice Questions

56. Why might it be easier to determine the bacterium that caused pneumonia than one that caused a wound infection?

A. There are very few microorganisms that can cause pneumonia, while there are many that can cause wound infections.

B.

Bacteria that cause pneumonia can be identified with few tests. Many bacteria are normally found on the skin and may be in the wound complicating identification of the pathogen.

C. We have much better tests for bacteria in the lungs than we do in wounds.

D. The techniques of 16S rRNA sequencing are easier to perform on a sample taken from the lungs than a sample taken from a wound.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 5. Evaluate

Learning Outcome: 10.01

Section: 10.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

57. A sample must contain many microorganisms in order to see any using microscopy techniques. Why?

A. The area on a microscope slide is very large compared to the relative size of microbes, and you take a very small amount of your sample to place on the slide surface. Therefore, you must have a large number of microbes initially in the culture to increase the chances that you'll come across one or more when looking at the slide surface through the magnifying lenses of the microscope.

B. Bacteria are very small, of course. If you don't have a LOT of them, how are you going to see them?

C. This is false-microscopy allows us to magnify a specimen to the point where we would be able to visualize even just a few microbes on the surface of the slide. As such, even if there are only a few microbes in a sample, we could easily visualize them with a microscope.

D. Microscopes only magnify what's on the slide. If you don't have a lot of microbes on the slide surface, you can't magnify the specimen enough to see them as individual cells.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 10.02

Section: 10.02

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

58. Why are molecular methods particularly useful for identification of microbes when they are difficult to grow?

- A. While all microbes can (and should) be grown for identification purposes, sometimes it's simply faster to use a molecular technique.
- B. They AREN'T useful-growing a microbe is clearly the only way to properly identify it.
- C.** Since all microbes use DNA, and we can sometimes detect and identify them through even very small amounts of their DNA, molecular methods allow us to identify microbes even when they can't be grown at all.
- D. Molecular methods are far cheaper methods than growing microbes for identification.

ASM Objective: 01.02 Mutations and horizontal gene transfer, along with the immense variety of microenvironments, have resulted in a vast diversity of microorganisms.

ASM Topic: Module 01 Evolution

Bloom's Level: 5. Evaluate

Learning Outcome: 10.03

Section: 10.03

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

59. Explain the difference between a biotype and a serotype.

- A. A biotype is the living type of microorganism identified, while the serotype is an individual's type of blood serum.
- B. A biotype is the type of biological environment a microbe will grow in, while the serotype is the type of blood serum that the microbe can grow in.
- C. A biotype is the particular phenotypic traits and characteristic structures of a biological microorganism, while the serotype is the list of molecules the microbe is able to make and secrete into the serum of an infected individual.
- D.** A biotype is the biochemical profile of a particular microorganism, while the serotype is the difference in its surface structures/antigens that will lead to separate immune responses from an organism (characterized by presence of different antibodies in the individual's serum).

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 3. Apply

Learning Outcome: 10.04

Section: 10.04

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

60.

When DNA probes are used to identify bacterial DNA similarities by hybridization, the probe DNA is heated and the template DNA is treated to separate the two strands. Why would the probe DNA be heated?

A. This is the only way to properly label the probe DNA.

B.

The probe may contain portions that are double-stranded. Heating it up breaks any possible hydrogen bonds that may have formed allowing the single-stranded sequences to hybridize with their complementary targets.

C. Heating it up activates the tag on the probe DNA before it hybridizes to the bacterial template DNA.

D. DNA hybridization can only take place at high temperatures, so all the DNA must be heated up prior to hybridization.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 5. Evaluate

Learning Outcome: 10.05

Section: 10.05

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

Chapter 11 The Diversity of Prokaryotic Organisms

Multiple Choice Questions

1. It has been estimated that 99% of the intestinal bacteria are
- A. facultative anaerobes.
 - B. obligate aerobes.
 - C. facultative aerobes.
 - D.** obligate anaerobes.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

2. The methanogens

A.

are part of the Domain Archaea.

- B. oxidize hydrogen gas to produce methane.
- C. appear only in aerobic environments.
- D. use oxygen as a terminal electron acceptor.

E.

are part of the Domain Archaea AND oxidize hydrogen gas to produce methane.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

3. Methanogens often grow in association with

- A. nitrifying bacteria.
- B. lithotrophic bacteria.
- C. photosynthetic bacteria.
- D.** fermentative bacteria.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

4. Comparatively greater energy is released when

- A. carbon dioxide is the final electron acceptor.
- B. hydrogen is the final electron acceptor.
- C. nitrate is the final electron acceptor.
- D.** oxygen is the final electron acceptor.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

5. Hydrogen sulfide

- A. is produced when sulfur compounds are used as terminal electron acceptors.
- B. may react with iron to produce a black precipitate.
- C. is produced by *Desulfovibrio*.
- D. has a rotten egg smell.
- E.** All of the choices are correct.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

6. Endospores

- A. are a form of reproduction.
- B. are a dormant form of a bacterium.
- C. are formed by members of medically relevant groups of bacteria.
- D. are involved in anaerobic respiration.
- E. are a dormant form of a bacterium AND are formed by members of medically relevant groups of bacteria.**

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

7. Lactic acid bacteria such as *Lactococcus*

- A. produce catalase.
- B. are obligate fermenters.**
- C. require anaerobic environments.
- D. use oxygen as a final electron acceptor.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

8. *Streptococcus pyogenes*

- A. is alpha-hemolytic.
- B. is gamma-hemolytic.
- C. is beta-hemolytic.**
- D. may form endospores.
- E. is alpha-hemolytic AND may form endospores.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Topic: Tools and Methods of Culturing, Classifying, and Identify Microorganisms

9. The lactobacilli, in their role as normal flora of the vagina, help the vagina resist infection by contributing to
- A. the neutrality of the vaginal mucus.
 - B. acidity of the vagina.**
 - C. food for the resident vaginal flora.
 - D. fertility of the host.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

10. Which of the following colonize the vagina during childbearing years?
- A. Streptococci
 - B. *Clostridium*
 - C. Lactobacilli**
 - D. *Enterobacter*
 - E.

Clostridium AND lactobacilli

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

11. A particular characteristic of disease-causing *Streptococcus* is
- A. catalase production.
 - B. beta-hemolysis.**
 - C. lactic acid production.
 - D. growth at refrigerator temperatures.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

12. *Propionibacterium*

- A. produces propionic acid.
- B. produces lactic acid.
- C. is responsible for the holes in Swiss cheese.
- D. requires aerobic environments.
- E.** produces propionic acid AND is responsible for the holes in Swiss cheese.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

13. Which of the following microbes is(are) important to cheese-making?

- A. lactic acid bacteria
- B. *Clostridium acetylbutylicum*
- C. *Desulfovibrio*
- D. *Propionibacterium*
- E.**

Lactic acid bacteria AND *Propionibacterium*

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

14. *Clostridium*, *Lactobacillus*, and *Propionibacterium* all
- A. use sulfur compounds as terminal electron acceptors.
 - B. oxidize inorganic compounds.
 - C. oxidize organic compounds.
 - D. use organic compounds as terminal electron acceptors.
 - E. oxidize organic compounds AND use organic compounds as terminal electron acceptors.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

15. Which of the following contains bacteriochlorophyll?
- A. *Bacillus subtilis*
 - B. *Staphylococcus aureus*
 - C. *Streptococcus pyogenes*
 - D. *E. coli*
 - E. *Chromatium*, *Thiospirillum*, *Thiodictyon***

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.02

Section: 11.02

Topic: Microbial World

16. Anoxygenic phototrophs
- A. produce oxygen.
 - B. use water as a source of electrons.
 - C. use hydrogen sulfide or organic compounds as a source of electrons.**
 - D. use the same form of chlorophyll found in terrestrial plants.
 - E. produce oxygen AND use the same form of chlorophyll found in terrestrial plants.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.02

Section: 11.02

Topic: Microbial World

17. The purple sulfur and green sulfur bacteria

- A. both use hydrogen sulfide as a source of electrons.
- B. generate oxygen.
- C. preferentially use organic molecules as an electron source.
- D. both lack gas vesicles.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.02

Section: 11.02

Topic: Microbial World

18. The earliest oxygenic phototrophs are thought to be

- A. purple sulfur bacteria.
- B. green nonsulfur bacteria.
- C. purple nonsulfur bacteria.
- D. cyanobacteria.
- E. green nonsulfur bacteria AND purple nonsulfur bacteria.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

19. Cyanobacteria

- A. are a form of algae.
- B. are prokaryotes.
- C. use hydrogen sulfide as an electron source.
- D. are eukaryotes.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

20. Phycobiliproteins are

- A. found in purple sulfur bacteria.
- B. found in cyanobacteria.
- C. used to gather wavelengths of light that are not well absorbed by chlorophyll.
- D. are used to reduce hydrogen sulfide.
- E. found in cyanobacteria AND used to gather wavelengths of light that are not well absorbed by chlorophyll.**

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

21. The genus of bacteria that is able to fix nitrogen and form heterocysts is

- A. *Pseudomonas*.
- B. *Escherichia*.
- C. *Vibrio*.
- D. *Anabaena*.**

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

22. Heterocysts

- A. are found in nitrogen-fixing cyanobacteria.
- B. are used to protect nitrogenase.
- C. produce catalase.
- D. generate oxygen.
- E. are found in nitrogen-fixing cyanobacteria AND are used to protect nitrogenase.**

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

23. Purple sulfur bacteria and filamentous sulfur-oxidizers both
- A. accumulate sulfur as intracellular granules.
 - B. fix nitrogen.
 - C. produce oxygen from carbon dioxide.
 - D. use gliding motility.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.04

Section: 11.04

Topic: Microbial World

24. Sulfuric acid is
- A. involved in bioleaching.
 - B. produced by unicellular sulfur-oxidizers.
 - C. produced by *Lactobacillus*.
 - D. a result of reduction of metal sulfides.
 - E. involved in bioleaching AND produced by unicellular sulfur-oxidizers.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 11.04

Section: 11.04

Topic: Microbial World

Chapter 11 - The Diversity of Prokaryotic Organisms

25.

The conversion of ammonium to nitrate could be accomplished by the presence of

A.

Nitrosomonas alone.

B.

Nitrobacter alone.

C.

Anabaena alone.

D.

both *Nitrosomonas* and *Nitrobacter*.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.04

Section: 11.04

Topic: Microbial World

26. The Gram-positive rod that is also acid-fast and is a human pathogen is

A. *Corynebacterium diphtheria*.

B. *Mycobacterium tuberculosis*.

C. *Streptococcus pyogenes*.

D. *Listeria monocytogenes*.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

27. Which organism(s) is/are acid-fast?

- A. *Nocardia*
- B. *Pseudomonas*
- C. *E. coli*
- D. *Mycobacterium*
- E. *Nocardia* AND *Mycobacterium***

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

28. Which of the following organisms is the causative agent of Hansen's disease (leprosy)?

- A. *Pseudomonas aeruginosa*
- B. *Mycobacterium avium*
- C. *Mycobacterium leprae***
- D. *Mycobacterium smegmatis*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

29. *Pseudomonas*

- A. are resistant to many disinfectants and antimicrobials.
- B. are mostly harmless except for the opportunistic *P. aeruginosa*.
- C.

require nutrient-rich environments.

D. do not contain plasmids.

E. are resistant to many disinfectants and antimicrobials AND are mostly harmless except for the opportunistic *P. aeruginosa*.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

30. *Thermus* and *Deinococcus*

- A. survive in extreme environments.
- B. are both thermophilic.
- C. are both radiation resistant.
- D. both serve as the source of Taq polymerase.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

31. Members of the family Enterobacteriaceae

- A. include *E. coli*, *Enterobacter*, *Salmonella*, and *Shigella*.
- B. include many medically relevant bacteria.
- C. primarily reside in the intestinal tract of humans and animals.
- D. are facultative anaerobes.
- E. All of the choices are correct.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.06

Section: 11.05

Topic: Microbial World

32. Coliforms

- A. are an informal grouping of enterics.
- B. ferment lactose.
- C.

include *E. coli*.

D. are used as indicators of fecal contamination.

E. All of the choices are correct.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.06

Section: 11.05

Topic: Microbial World

33. Bacteria that may form endospores include

- A. *E. coli*.
- B. *Pseudomonas* and *Micrococcus*.
- C. *Clostridium* and *Bacillus*.
- D. *Enterococcus* and *Deinococcus*.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

Chapter 11 - The Diversity of Prokaryotic Organisms

34.

Which of the following structures would be the best choice as a biological indicator to test autoclave operations?

A.

Endospores formed by *Geobacillus (Bacillus) stearothermophilus*

B.

Cysts formed by *Azotobacter* species

C.

Microcysts with the fruiting bodies of myxobacteria

D.

Dormant spores in the conidia of *Streptomyces* species

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

35. *Azotobacter*

A. forms endospores.

B. forms cysts.

C. fixes carbon dioxide.

D. are used as an indicator of fecal pollution.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

36. *Streptomyces*

- A. resemble fungi in their pattern of growth.
- B. produce a number of antibiotics.
- C.

produce a characteristic blue-green pigment.

D. form endospores.

E. resemble fungi in their pattern of growth AND produce a number of antibiotics.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

37. Complex structures called fruiting bodies are a characteristic of

- A. Clostridia.
- B.** myxobacteria.
- C. *Streptomyces*.
- D. lactic acid bacteria.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

38. *Agrobacterium*

A.

contain the Ti plasmid that modifies the growth of plant tissue.

B. produce antibiotics.

C. infect animal cells.

D. resemble fungus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.08

Section: 11.06

Topic: Microbial World

39. *Rhizobium*

A. fix nitrogen inside nodules on the roots of legumes.

B. resemble fungi.

C. produce antibiotics.

D. produce a gall in plants.

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.08

Section: 11.06

Topic: Microbial World

40. Which causes uncontrolled growth of plant tissue, resulting in a tumor?

A. *Rhizobium*

B. *Agrobacterium*

C. *Bacillus anthracis*

D. *Yersinia pestis*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 11.08

Section: 11.06

Topic: Microbial World

41. *Sphaerotilus* and *Leptothrix* are examples of

- A. purple sulfur bacteria.
- B. *Enterobacteriaceae*.
- C. sheathed bacteria.**
- D. green nonsulfur bacteria.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

42. Swarmer cells are

- A. formed by Myxobacteria.
- B. formed by sheathed bacteria.**
- C. also known as coliforms.
- D. part of the green nonsulfur bacteria.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

43. *Bdellovibrio*

- A. prey on other bacteria.**
- B. are parasites of plants.
- C. may fix nitrogen.
- D. are photosynthetic.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

44. Luminescence

- A. is catalyzed by luciferase.
- B. may be controlled by quorum sensing.
- C. may be produced by bacteria.
- D. All of the choices are correct.**

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

45. Movement of spirochetes occurs by means of structures called

- A. cilia.
- B. flagella.
- C. endoflagella.**
- D. pili.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

46. Many spirochetes are difficult to cultivate, so their classification is based on their

- A. morphology and ability to cause disease.**
- B. number of flagella.
- C. pattern of pili.
- D. number of chromosomes.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 11.09

Section: 11.07

Topic: Microbial World

47. *Helicobacter pylori*

- A. inhabit the stomach.
- B. inhabit squid ink sacs.
- C. cause crown gall in plants.
- D. have axonemes.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

48. Organisms that typically produce colonies with a fried egg appearance are the

- A. *Mycoplasma*.
- B. *Actinomyces*.
- C. *Chlamydia*.
- D. *Mycobacteria*.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

49. *Mycoplasma*

- A. lack peptidoglycan.
- B. are the smallest free-living organisms.
- C. have sterols in their membranes.
- D. are killed by penicillin.
- E. lack peptidoglycan, are the smallest free-living organisms AND have sterols in their membranes.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

50. *Treponema* and *Borrelia*

- A. are luminescent.
- B. are endosymbionts.
- C. are spirochaetes.
- D. are both easily grown on artificial media.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

51. Which of the following is/are obligate intracellular parasites?

- A. *Chlamydia* and *Rickettsia*
- B. *E. coli* and *Pseudomonas*
- C. *Mycoplasma*
- D. *Treponema pallidum*

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

52. Reticulate and elementary bodies are two forms of

- A. *Mycoplasma*.
- B. *Caulobacter*.
- C. *Chlamydia*.
- D. *Myxobacteria*.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

53. *Wolbachia* are found only in

- A. hot springs.
- B. plants.
- C. mammals.
- D.** arthropods.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

54. The *Euryarchaeota* includes all

- A. known thermophilic extreme acidophiles.
- B. the bacteria.
- C.** known methanogens.
- D. green sulfur bacteria.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 1. Remember

Learning Outcome: 11.11

Section: 11.09

Topic: Microbial World

55. Members of the *Archaea* typically thrive in conditions of excessive

- A. heat.
- B. acidity.
- C. alkalinity.
- D. salinity.
- E.** All of the choices are correct.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Objective: 08.05 Use appropriate microbiological and molecular lab equipment.

Bloom's Level: 2. Understand

Learning Outcome: 11.11

Section: 11.09

Topic: Microbial World

56. *Archaea* are typically found living in extreme environments. An exception to this are the
- A. sulfur-oxidizing archaea.
 - B. sulfur-reducing archaea.
 - C. methanogens.**
 - D. sulfur-oxidizing archaea AND sulfur-reducing archaea.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.11

Section: 11.09

Topic: Microbial World

True / False Questions

57. The skin and oral cavity may have anaerobic microenvironments.

TRUE

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

58. Lactic acid bacteria such as *Streptococcus* are obligate fermenters that can exist in an aerobic environment due to their use of catalase to mitigate the presence of oxygen.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

59. Bacteria and Archaea both have members that use sulfur compounds as a terminal electron acceptor.

TRUE

ASM Objective: 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g. nitrogen fixation, methane production, anoxygenic photosynthesis).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 11.01

Section: 11.01

Topic: Microbial World

60. Anoxygenic phototrophs grow photosynthetically only under aerobic conditions.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.02

Section: 11.02

Topic: Microbial World

61. Obligate aerobes may transform energy via fermentation.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

62. The most medically relevant species of *Pseudomonas* is *P. aeruginosa*.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 11.05

Section: 11.05

Topic: Microbial World

63. *Streptomyces* produce a number of antibiotics.

TRUE

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 11.07

Section: 11.06

Topic: Microbial World

64. *Rhizobium* is considered an endosymbiont with plants.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 11.08

Section: 11.06

Topic: Microbial World

65. *Chlamydia* occurs in two forms, a reticulate body and an elementary body.

TRUE

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

Multiple Choice Questions

66. Approximately 99% of the microbes in the intestines are obligate anaerobes. We have plenty of blood vessels that can bring oxygen to the tissues of the intestines. Why would there be obligate anaerobes within these areas?

A. The bacteria in the intestines are protected from exposure to the oxygen in the tissues by the lining of the intestines.

B. The bacteria consume all the oxygen in the tissue areas brought by the blood vessels, creating an anaerobic environment.

C.

The inside space of the intestines, where bacteria reside, is highly anaerobic. It is deep inside the body where oxygen cannot reach AND, unlike the surrounding tissues, it is not supplied with blood.

D. The aerobic microbes are outcompeted for nutrients in these areas by the anaerobic microbes.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 11.06

Section: 11.05

Topic: Microbial World

67. Relatively little is known about many obligate anaerobes. Why might this be so?

A. The obligate aerobes are far more numerous, and also far more interesting.

B. It's much harder to provide the right atmospheric environment to cultivate obligate anaerobes, so it's been harder to study them.

C. Only obligate aerobes cause disease, so we've had little reason to study obligate anaerobes.

D. The majority of obligate anaerobes are very nutritionally fastidious, which has slowed their study.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 11.06

Section: 11.05

Topic: Microbial World

68. How do anoxygenic phototrophs benefit from possessing accessory pigments that allow light to be harvested at deeper areas of a fluid environment?

A. This allows even anaerobic microbes to conduct photosynthesis, as they can harvest light energy in the deeper areas where oxygen won't be present.

B.

The cells can use wavelengths of light that haven't been absorbed (filtered out) by the photosynthetic organisms closer to the surface of the fluid.

C. They don't have to compete with other cells that utilize oxygen in the upper levels for the scarce nutrients in the fluid environment.

D.

This allows even anaerobic microbes to conduct photosynthesis, as they can harvest light energy in the deeper areas where oxygen won't be present AND can use wavelengths of light not absorbed (filtered out) by the photosynthetic organisms closer to the surface of the fluid.

E.

This allows even anaerobic microbes to conduct photosynthesis, as they can harvest light energy in the deeper areas where oxygen won't be present, use wavelengths of light not absorbed (filtered out) by the photosynthetic organisms closer to the surface of the fluid; AND don't have to compete with other cells that utilize oxygen in the upper levels for the scarce nutrients in the fluid environment.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 5. Evaluate

Learning Outcome: 11.02

Section: 11.02

Topic: Microbial World

69. How could heavily fertilized lawns contribute to cyanobacterial blooms in lakes and oceans?

A. Run-off from the lawns will get into the water system, leading to large amounts of nitrogen that can be used by cyanobacteria in water systems.

B. The large amounts of nutrient-rich grass that are created will be mowed down, with grass clipping bits eventually washing into sewer systems and into larger bodies of water. These grass clippings will serve as a nutrient source for cyanobacteria, leading to blooms.

C.

Large amounts of fertilizer will lead to excessive production of greenhouse gases (like CO₂) from grass in lawns. Excessive CO₂ production will lead to large blooms of cyanobacteria in water systems.

D. They won't-the two systems are completely unrelated. How could grass in lawns contribute to effects in lakes and oceans?

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 11.03

Section: 11.03

Topic: Microbial World

70. The genomes of free-living spirochaetes are larger than those living in animal hosts. Why might this be so?

A.

Free-living spirochetes will need genes to code for additional proteins to synthesize or obtain their own food from the environment around them. Parasitic spirochetes obtain nutrients from the animal host, and may not need to move towards those nutrients either.

B. The spirochetes in animal hosts are different species entirely. As different species, they would naturally have smaller genomes.

C. A smaller genome implies simplicity-the spirochetes living in animal hosts have fewer needs, so they need fewer genes.

D. It isn't so-all spirochetes would have the same size genomes, since they're all the same species of microbe.

ASM Objective: 04.01 Genetic variations can impact microbial functions (e.g. in biofilm formation, pathogenicity and drug resistance).

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 11.10

Section: 11.08

Topic: Microbial World

71. A student complains that it makes no sense to worry about coliform bacteria in water, since we naturally possess harmless coliforms in our intestines anyway. Why do regulatory agencies worry about coliform bacteria in water supplies, then?

A. The coliforms in our intestines can sometimes turn harmful, causing intestinal infections. We need to constantly be on guard against this happening. Coliforms in water might add to this potential problem.

B. Not all coliforms are harmless and symbiotic with human beings. Some may carry genes/proteins that can make them dangerous to humans. It's best to keep coliforms OUT of our drinking water, since it's difficult to identify which ones might be harmless and which ones might be harmful.

C. Regulatory agencies are worried that multiple types of coliforms in water might lead to greater antibiotic resistance in the bacterial populations. They try to keep them out of water to keep antibiotic resistance levels down.

D. Regulatory agencies simply need something to do to justify their existence. There is no real danger from coliforms in water supplies.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 11.06

Section: 11.05

Topic: Microbial World

Chapter 12

The Eukaryotic Members of the Microbial World

Multiple Choice Questions

1.

In the late nineteenth century, immigration from Ireland to the United States occurred in high numbers due to an infection of potatoes by

- A. bacteria.
- B. viruses.
- C. fungi.
- D. amoeboid protozoa.
- E.**

water molds.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: History of Microbiology

2. Plant pathology grew in importance as a field of study after it was shown that the Irish potato blight was caused by

- A. bacteria.
- B. viruses.
- C. fungi.
- D. amoeboid protozoa.
- E.**

water molds.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: History of Microbiology

3. Most fungi are

- A.** aerobic or facultatively anaerobic.
- B. obligate anaerobes.
- C. obligate aerobes.
- D. microaerophiles.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

Chapter 12 - The Eukaryotic Members of the Microbial World

4. Fungi are particularly adept at infecting

- A. protozoans.
- B. algae.
- C. animals.
- D.** plants.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

5. The return of carbon dioxide to the atmosphere and nitrogen to the soil is due to the action of

- A. viruses and plants.
- B. bacteria and viruses.
- C.** fungi and bacteria.
- D. fungi and viruses.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

6. All fungi have _____ in their cell walls.

- A. cellulose
- B. pectin
- C. peptidoglycan
- D.** chitin

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

Chapter 12 - The Eukaryotic Members of the Microbial World

7. Fungi are classified according to their

- A. mode of locomotion.
- B. morphology.
- C. mode of nutrition.
- D. method of sexual reproduction.**

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

8. The group of Fungi in which sexual reproduction has not been observed is

- A. Ascomycetes.
- B. Deuteromycetes.**
- C. Zygomycetes.
- D. Basidiomycetes.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

9. Deuteromycetes has been further classified using

- A. DNA probes.
- B. rRNA analysis.**
- C. Southern blotting.
- D. replica plating.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

10. The terms yeast, mold, and mushrooms refers to fungal

- A. reproduction.
- B. morphology.**
- C. nutrition.
- D. parasites.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

11. A tangle of fungal hyphae is generally known as a

- A. bud.
- B. mycelium.**
- C. germ tube.
- D. spore.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

12. Dimorphic fungi

- A. may grow as mycelia or yeast.
- B. are often associated with disease in humans.
- C. are mushrooms.
- D. are strictly hyphae.
- E. may grow as mycelia or yeast AND are often associated with disease in humans.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

Chapter 12 - The Eukaryotic Members of the Microbial World

13. Fungal spores are a major cause of

- A. anaerobic disease.
- B. fermentation.
- C. food spoilage.
- D.** asthma.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

14. The pH at which most fungi thrive is

- A. 3.0.
- B.** 5.0.
- C. 7.0.
- D. 8.0.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

15. Lichens may be an association of

- A. several different fungi.
- B. protozoa and bacteria.
- C.** algae and fungus.
- D. virus and algae.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.02

Section: 12.01

Topic: Eukaryotes

16. Mycorrhizae

- A. are vital for the survival of lichens.
- B. are vital for the survival of many plants.
- C. increase the absorptive ability of roots.
- D.

are used in the production of wine, beer, and bread.

E. are vital for the survival of many plants AND increase the absorptive ability of roots.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.02

Section: 12.01

Topic: Eukaryotes

17. Haustoria

- A. are a form of parasitic protozoan.
- B. refers to the reproductive structure formed by slime molds.
- C.** are specialized hyphae used by parasitic fungi.
- D. are the reproductive form of protozoans.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

18. Fungi capable of dimorphism grow either as

- A. rhizoids or hyphae.
- B.** yeast-like or mycelium.
- C. germ tubes or buds.
- D. spores or mushrooms.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

19. Fungal diseases are generally referred to as

- A. mycoses.
- B. infections.
- C. systemics.
- D. infestations.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

20. Aflatoxins

- A. are produced by *Aspergillus*.
- B. are possible carcinogens.
- C. may be found in peanuts.
- D. are toxins.
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

21. Fungi that are important for fermentation of fruits

- A. are yeasts.
- B. are facultative anaerobes.
- C. grow well at acid pH.
- D. secrete enzymes that degrade organic molecules.
- E. All of the choices are correct.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

22. Coccidioidomycosis is

- A. a fungal disease.
- B. a protozoal disease.
- C. caused by *Coccidioides* sp.
- D. caused by *Candida* sp.
- E.** a fungal disease AND caused by *Coccidioides* sp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

23. Fungi are important in

- A. food production.
- B. food spoilage.
- C. production of antibiotics.
- D. disease of plants.
- E.** All of the choices are correct.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

24. Fungi are important because of their ability to

- A. help many plants grow.
- B. cause disease in plants.
- C. make certain foods and beverages.
- D. spoil food.
- E.** All of the above.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.03

Section: 12.01

Topic: Eukaryotes

25. Algae are important environmentally as

- A. major producers of carbon dioxide.
- B. major producers of oxygen.**
- C. local flora.
- D. local contaminants.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

26. Free-floating, photosynthetic organisms found in marine environments are

- A. *Bucella*.
- B. blue-green algae.
- C. krill.
- D. phytoplankton.**

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

27. Algae

- A. often grow in areas where other forms of life may have difficulty.**
- B. are strictly macroscopic organisms.
- C. have a vascular system similar to plants.
- D. are only found in the soil.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

28. Macroscopic algae possess a special structure that acts as an anchor and is commonly called

- A. a thallus.
- B. a holdfast.**
- C. roots.
- D. the stipe.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

29. Agar is obtained from

- A. bacteria.
- B. algae.**
- C. protozoans.
- D. plants.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

30. Diatoms are algae whose silicon dioxide-containing shells are useful economically as

- A. filters.**
- B. fertilizers.
- C. stabilizers.
- D. thickeners.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

31. The site in a photosynthetic eukaryotic cell where photosynthesis occurs is the
- A. nucleus.
 - B. carotenoid.
 - C. mitochondria.
 - D.** chloroplast.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

32. Sexual reproduction in algae utilizes meiosis that results in the production of
- A. spores with twice as much DNA as the parental cells.
 - B.** gametes with half the amount of DNA as in the parental cells.
 - C. spores with the same amount of DNA as the parental cells.
 - D. swarming cells with the same amount of DNA as the parental cells.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

33. Paralytic shellfish poisoning occurs when humans eat shellfish that have fed on
- A.** *Gonyaulax* spp.
 - B. *Salmonella* spp.
 - C.

Vibrio cholerae.

- D. *E. coli.*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.05

Section: 12.02

Topic: Eukaryotes

34. *Gonyaulax*

- A. produces a non-protein neurotoxin.
- B. infects the nervous system of humans.
- C. is a dinoflagellate.
- D. produces a non-protein neurotoxin AND is a dinoflagellate.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.05

Section: 12.02

Topic: Eukaryotes

35.

Organisms that may cause red tide are

A.

green algae.

B.

brown algae.

C.

dinoflagellates

D.

euglenids.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.05

Section: 12.02

Topic: Eukaryotes

36. Single-celled eukaryotic organisms that lack chlorophyll are called

- A. Algae.
- B. Protozoa.**
- C. *Chlorophyta*.
- D. *Salmonella*.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

37.

Protozoan classification used to be based on their means of

- A. locomotion.**
- B. growth.
- C. reproduction.
- D. obtaining nutrients.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

38. Sarcodina move by means of

- A. flagella.
- B. apicomplexans.
- C. cilia.
- D. pseudopodia.**

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

39. Protozoans are an important part of the food chain ingesting large numbers of

- A. fish.
- B. bacteria and algae.**
- C. shellfish.
- D. other protozoans.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

40. The most necessary habitat requirement of protozoa is

- A. moisture.**
- B. light.
- C. temperature.
- D. UV light.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

41. The ability to exist as either a trophozoite or a cyst is characteristic of many

- A. fungi.
- B. viruses.
- C. protozoa.**
- D. bacteria.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

42. Schizogony

- A. means multiple fissions.
- B. is performed by bacteria.
- C. is performed by protozoa.
- D. is a form of reproduction.
- E.** means multiple fissions AND is performed by protozoa.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

43. One of the greatest causes of human deaths through time has been due to

- A. *Giardia* spp.
- B. *Histoplasma* spp.
- C. *Trypanosoma* spp.
- D.** *Plasmodium* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.07

Section: 12.03

Topic: Infection and Disease

44. Convergent evolution

- A. explains the morphological similarity yet major genetic differences found between slime molds and fungi.
- B. refers to two different organisms that develop similar characteristics in adaptation to similar environments.
- C. explains the structure of lichens.
- D. refers to the one organism dividing into two.
- E.** explains the morphological similarity yet major genetic differences found between slime molds and fungi AND refers to two different organisms that develop similar characteristics in adaptation to similar environments.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 12.09

Section: 12.04

Topic: Eukaryotes

45. When cellular slime molds run out of food, they form a

- A. plasmodium.
- B.** slug.
- C. myxamoeba.
- D. rhizoid.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 12.08

Section: 12.04

Topic: Eukaryotes

46. Lyme disease is transmitted by

- A. ticks.
- B. lice.
- C. mosquitoes.
- D. fleas.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.13

Section: 12.06

Topic: Infection and Disease

47. *Pediculus humanus*

- A. only uses humans as a host.
- B. is carried by mosquitoes.
- C. only infects hands.
- D. can transmit a bacterial disease.
- E. only uses humans as a host AND can transmit a bacterial disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.13

Section: 12.06

Topic: Infection and Disease

48. Lice and mites

- A. are both arachnids.
- B. may both be spread by personal contact.
- C. are intestinal parasites.
- D. cause Lyme disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.13

Section: 12.06

Topic: Infection and Disease

49. Which are not arthropods?

A.

Mosquitoes

B.

Fleas

C.

Lice

D.

Ticks

E.

Flukes

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Learning Outcome: 12.13

Section: 12.06

Topic: Eukaryotes

50. *Sarcoptes scabiei*

A. transmit bacterial disease.

B. are responsible for scabies.

C. infect the blood.

D. are transmitted by mosquitoes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.13

Section: 12.06

Topic: Infection and Disease

Chapter 12 - The Eukaryotic Members of the Microbial World

51. Fleas

- A. may transmit *Yersinia pestis*.
- B. may transmit Lyme disease.
- C. may transmit a toxin.
- D.

have only one host, humans.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.13

Section: 12.06

Topic: Infection and Disease

52. Nematodes

- A. are roundworms.
- B. are found in the gastrointestinal tract or the blood.
- C. are carried by bacteria.
- D. have flat segmented bodies.
- E. are roundworms AND are found in the gastrointestinal tract or the blood.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.11

Section: 12.05

Topic: Infection and Disease

53. Tapeworms

- A. have a complicated digestive system.
- B. do not have a digestive system.
- C. may be transmitted by eating undercooked meat.
- D. have a larval stage known as a cercaria.
- E. do not have a digestive system AND may be transmitted by eating undercooked meat.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 12.05

Learning Outcome: 12.10

Section: 12.05

Topic: Infection and Disease

True / False Questions

54. Fungi are often capable of locomotion through the use of flagella.

FALSE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

55. Algae may directly infect humans and cause disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.05

Section: 12.02

Topic: Eukaryotes

56. Algae have a vascular system very similar to that found in plants.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 12.04

Section: 12.02

Topic: Eukaryotes

57. Protozoans are eukaryotes and as such will always possess a nucleus, mitochondria, and chloroplasts.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

58. Protozoans are usually multicellular and found in arid environments.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

59. Fungus grows well on fruits and many vegetables due to their alkaline pH.

FALSE

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 12.01

Section: 12.01

Topic: Eukaryotes

60. Slime molds and water molds are types of fungi.

FALSE

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 2. Understand

Learning Outcome: 12.08

Section: 12.04

Topic: Eukaryotes

61. Most of the medically important multicellular parasites are arthropods or helminths.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 12.10

Section: 12.06

Topic: Infection and Disease

62.

Typically arthropods serve as vectors of disease, while helminths directly cause disease.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 12.12

Section: 12.06

Topic: Infection and Disease

Multiple Choice Questions

63. Why would all protozoa be expected to require large amounts of water in their habitats?

- A. They require water to avoid dehydration and death. Without being in water, they would quickly dehydrate (due to their small size) and die.
- B. They require water to help them during photosynthesis by providing an electron source.
- C. They require water to move around in to seek food particles. Without water, they would be unable to move at all.
- D. All of the above are correct.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 12.06

Section: 12.03

Topic: Eukaryotes

64. Are all fungi detrimental (bad) for other organisms?

- A. Yes-think of molds that destroy plant crops, or fungal infections that cause athlete's foot. All fungi are bad for organisms they colonize.
- B. Yes-fungi feed directly on organic material (oftentimes killing it or feeding on it after the original organism has died). As such, they are always bad for other organisms.
- C. No-fungi are sometimes good, sometimes bad for other organisms. It really depends on which fungus you're talking about and the relationship it has with the other organism. Some fungi, for example, can form a symbiotic relationship with plant roots that increases their nutrient and water absorption. This is good.
- D. No-fungi are ALWAYS good when they interact with other organisms. There's never a downside or negative aspect to such interactions. Both sides always benefit from the relationship.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 12.02

Section: 12.01

Topic: Eukaryotes

65. Why were the slime molds and water molds once considered to be fungi?

A. Early identification methods focused on appearances rather than biochemical characteristics.

B. Early identification methods focused on appearances rather than genetic similarities/differences.

C. They ARE fungi.

D.

They possess the same material in their cell walls (chitin) that fungi possess.

ASM Objective: 01.05 The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

ASM Topic: Module 01 Evolution

Bloom's Level: 5. Evaluate

Learning Outcome: 12.09

Section: 12.04

Topic: Eukaryotes

66. How would increased travel lead to increased spread of multicellular eukaryotic parasites?

A. Many eukaryotic parasites are transmitted **directly** from person to person via airborne transmission-so getting an infected individual onto a plane of susceptible individuals would increase spread.

B.

Many eukaryotic parasites depend on **vectors** (often small blood-sucking insects) for transmission-so moving an infected individual into an area with new populations of vectors and new susceptible humans would increase the spread of the illness.

C.

It really would NOT-most individuals are screened for parasitic infections prior to traveling out of highly infected areas. We also have quarantine abilities at customs stations for individuals entering the United States.

D. Eukaryotic parasites are too small to travel great distances effectively-by hitching a ride on luggage, clothing, fruit/vegetables, and other food products, they can enter new geographic areas.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 12.12

Section: 12.06

Topic: Infection and Disease

67.

Why would it be more difficult to treat diseases in humans caused by members of the *Eukarya* than diseases caused by the *Bacteria*?

- A. Multicellular organisms always have their own immune systems to contend with-so any treatment we develop needs to overcome this built-in protection mechanism in such organisms.
- B. Since bacteria are so much simpler (being single-celled), they are inherently easier to kill off than multi-cellular eukaryotic microbes.
- C. Eukaryotic microbes use many of the same enzymes and systems as humans-so we lose the ability to target certain molecules that might be present ONLY in the cell type we want to eliminate. There's too much overlap when both organisms are eukaryotic.
- D. Eukaryotic microbes (unlike prokaryotes) often secrete compounds that breakdown and eliminate drugs used against them. This makes them much harder to effectively eliminate than bacteria.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 12.13

Section: 12.06

Topic: Eukaryotes

Chapter 13 Viruses, Viroids, and Prions

Multiple Choice Questions

1. The term filterable viruses was coined by
A. Beijerinck.
B. Iwanowsky.
C. Twort.
D. d'Herelle.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: History of Microbiology

2.

Crystallization of tobacco mosaic virus was accomplished by

- A. Berkley.
B. Stanley.
C. Iwanowsky.
D. Twort.

ASM Objective: 06.02 Microorganisms provide essential models that give us fundamental knowledge about life processes.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

3. Viruses that infect bacteria are referred to as

- A. viralcidens.
- B. bacteriocidins.
- C. bacterialogens.
- D.** bacteriophages.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

4. A virion is a(n)

- A. pathogenic virus.
- B. subviral particle.
- C.** complete, extracellular virus particle.
- D. enveloped virus particle.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

5. A virion is composed of

A.

lipid, protein, and either RNA or DNA.

B.

protein and either RNA or DNA, but no lipid.

C.

protein and both RNA and DNA, but no lipid.

D. protein, either RNA or DNA, and possibly lipid.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

6. The protein coat of a virus

A. is called a capsomere.

B. is called a capsid.

C. protects the nucleic acid.

D.

is involved in the recognition of host cell receptors by non-enveloped viruses.

E.

is called a capsid, protects the nucleic acid, AND is involved in the recognition of host cell receptors by non-enveloped viruses.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

Chapter 13 - Viruses, Viroids, and Prions

7. Which does not refer to the shape of a virus?

A.

Icosahedral (isometric)

B.

Helical

C.

Complex

D.

Bacillus

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

8. The shape of the virus is determined by its

A. nucleic acid.

B. capsid.

C. envelope.

D. tail.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

Chapter 13 - Viruses, Viroids, and Prions

9.

The viral envelope closely resembles the

A. prokaryotic cell wall.

B. capsomere.

C.

eukaryotic cellular membrane.

D. cytoplasm.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

10. The protein projections on the surface of a virus that are involved in attachment to the host cell are called

A. suckers.

B. pili.

C. cilia.

D. spikes.

E. hooks.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

11. Outside of living cells, viruses are
- A. scavenging glucose.
 - B. slowly stockpiling ATP from the mitochondria.
 - C. using cilia to move to the next host.
 - D.** metabolically inert.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

12. Viruses
- A. probably keep the numbers of bacteria in check.
 - B. have no effect on the number of bacteria.
 - C. increase the number of bacteria.
 - D. are active in passing DNA from one bacterium to another.
 - E.** probably keep the numbers of bacteria in check AND are active in passing DNA from one bacterium to another.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

13. What part of the attached bacteriophage enters through the host cell wall?

A.

The entire virus

B.

Only the enzymes necessary for replication

C.

The nucleic acid

D.

The nucleic acid and capsid

E.

The capsid only

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

14. A phage that replicates inside the host cell and then lyses its host during its release is a

A. virulent or lytic phage.

B. latent phage.

C. lysogenic phage.

D. dormant phage.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

15. The correct order for the stages of a phage infection is:

A.

penetration, transcription, attachment, replication of nucleic acid and protein, assembly, release.

B.

attachment, penetration, transcription, replication of nucleic acid and protein, assembly, release.

C.

attachment, replication of nucleic acid and protein, penetration, transcription, assembly, release.

D.

transcription, attachment replication of nucleic acid and protein, assembly, penetration, release.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

16. Phages that can either replicate and cause cell lysis or can integrate their DNA into the host DNA are called

A. lysogenic phages.

B. lytic phages.

C. virulent phages.

D. segmented phages.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

17. One of the most intensively studied virulent phages which infects *E. coli* is

- A. T9.
- B. T4.**
- C. beta.
- D. gamma.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

18. During attachment of phage to *E. coli*, the phage

- A. actively seek out the bacteria.
- B. randomly bump into the bacteria.
- C. attach to proteins or carbohydrates on the bacterial surface.
- D. attach to the bacterial RNA.
- E. randomly bump into the bacteria AND attach to proteins or carbohydrates on the bacterial surface.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

19. What part of the *E. coli* T4 phage attaches to the host cell receptors?

A.

Capsid fragments around the nucleic acid

B.

Protein fibers at the end of the phage tail

C.

Pili of the envelope

D.

Spikes of the envelope

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

20. During penetration of *E. coli* by the T4 phage

A. lysozyme is used to allow entry of the phage capsid.

B.

the tail acts as a "hypodermic needle," injecting the phage DNA into the cell.

C. the protein fibers digest a hole in the cell wall.

D. the bacterial receptor molecules open a hole through the cell wall.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

21. Phage-encoded proteins are
- A. coded for by host DNA.
 - B. coded for by phage DNA.
 - C. proteins normally present in the uninfected cell.
 - D. early proteins.
 - E. coded for by phage DNA AND early proteins.**

Bloom's Level: 2. Understand
Learning Outcome: 13.03
Section: 13.02
Topic: Viruses

22. Phage-encoded enzymes are
- A. all produced simultaneously.
 - B. produced in a sequential manner.
 - C. strictly host enzymes.
 - D. used to customize the cell for viral production.
 - E. produced in a sequential manner AND used to customize the cell for viral production.**

Bloom's Level: 2. Understand
Learning Outcome: 13.03
Section: 13.02
Topic: Viruses

23. Assembly of the T4 phage
- A. may involve some self-assembly.
 - B. may involve the use of scaffolds.
 - C. is completely self-assembly.
 - D. is completely dependent on scaffolds.
 - E. may involve some self-assembly AND may involve the use of scaffolds.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 2. Understand
Learning Outcome: 13.03
Section: 13.02
Topic: Viruses

24. In the case of T-even phages, the burst size is about

- A. 1 per host cell.
- B. 5 per host cell.
- C. 200 per host cell.
- D.

1,000 per host cell.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

25. The time from absorption to release for T-even phage is about

- A. 1 minute.
- B. 10 minutes.
- C. 30 minutes.
- D. 1 day.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

26. The replicative form of nucleic acid in filamentous phages is

- A. dsDNA.
- B. dsRNA.
- C. positive ssRNA.
- D. negative ssDNA.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

27. Filamentous phage

- A. only infect *E. coli* that have pili.
- B. only infect *E. coli* lacking pili.
- C. infect *E. coli* regardless of the presence of pili.
- D. do not infect *E. coli*.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

28. Which is a filamentous phage?

A.

M13.

B.

T4.

C.

Lambda.

D.

TMV.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

29. The bacterial viruses that are released by a process termed extrusion are called

- A. lysogenic viruses.
- B. temperate phages.
- C. filamentous phages.
- D. lambda viruses.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

30. The filamentous phages all contain

- A. single-stranded DNA.
- B. double-stranded DNA.
- C. single-stranded RNA.
- D. double-stranded RNA.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

31.

An exit method used by viruses that does not immediately destroy the host bacterium is

- A. lysis.
- B. inversion.
- C. extrusion.
- D. excising.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

32. In the replication of phage containing positive-sense DNA,
- A. the host's enzymes are used to make dsDNA.
 - B. the host's DNA polymerase uses the phage RNA as a template to make negative-sense DNA.
 - C. a phage-encoded DNA polymerase is used to make negative-sense RNA using the phage positive-sense RNA as a template.
 - D. a phage-encoded DNA polymerase is used to make DNA using the phage positive-sense RNA as a template.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

33. Most phages that contain single-stranded DNA
- A. are extruded.
 - B. contain a positive-sense DNA strand.
 - C. have their DNA transformed to double-stranded DNA before replication and transcription occur.
 - D. All of the choices are correct.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

34. Regarding phage replication,
- A. the majority of phages are temperate.
 - B. when integrated into host DNA, the phage DNA is called a prophage.
 - C. lambda is a good example of a temperate phage.
 - D.** All of the choices are correct.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

35. A temperate phage
- A. may be lysogenic.
 - B. may be lytic.
 - C. enters a lysogenic or lytic life cycle shortly after entering the host cell.
 - D. are all RNA viruses.
 - E.** may be lysogenic AND enters a lysogenic or lytic life cycle shortly after entering the host cell.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

36. The integration of phage DNA into the bacterial chromosome occurs because of A.

the phage's ability to synthesize an enzyme that integrates its DNA into the host's chromosome.

- B. the phage's ability to synthesize enzymes to enter the bacterium.
- C. similar RNA nucleotides in both.
- D. the similarity in enzyme metabolism.
- E. the phage's ability to synthesize enzymes to enter the bacterium AND similar RNA nucleotides in both.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

37. Once integrated, phage DNA can remain in the prophage state as long as

- A. the bacteria is frequently plated on new media.
- B. certain phage genes are excised.
- C. certain phage genes are repressed.
- D. bacterial repressor genes are activated.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

38. The activation of the SOS system in a bacterium infected with a prophage results in
- A. destruction of the viral genes.
 - B. complete lysis of the bacterial culture.
 - C. mutation of the DNA.
 - D. destruction of the viral repressor through host protease activity.
 - E. complete lysis of the bacterial culture AND destruction of the viral repressor through host protease activity.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

39. Lysogenized cells
- A. are immune to any further infection by any virus.
 - B. are immune to infection by the same virus.
 - C. may have new properties.
 - D. respond to infection with the SOS response.
 - E. are immune to infection by the same virus AND may have new properties.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.04

Section: 13.02

Topic: Viruses

40. The phenomenon responsible for the ability of *Corynebacterium diphtherium* to produce the virulent toxin responsible for the devastating effects of diphtheria is called

- A. self-assembly.
- B. matrix conversion.
- C. prion protein.
- D.** lysogenic conversion.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.04

Section: 13.02

Topic: Infection and Disease

41. Transducing virulent phages do not lyse the cells they invade because

- A. transformation is taking place in the phage and this is transferred to the bacterium.
- B.** bacterial DNA has replaced critical viral DNA in the phage.
- C. their virulence is dependent on the bacteria and virus replicating together.
- D. the lytic genes are unable to enter during penetration and are shed outside the host.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

42. DNA is protected from restriction enzymes by being

- A. sequestered in a lysosome.
- B. turned into RNA.
- C.** methylated.
- D.

made into double-stranded RNA.

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

43. A limiting factor for viral infection is

- A. internal metabolic temperature of the host cell.
- B. nutrition of the host cell.
- C. stage of cell cycle of the host cell.
- D.** presence of specific receptor molecules on the host cell.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

44.

If the infecting phage lacks some critical pieces of DNA necessary for replication, it is called

- A. incomplete.
- B. mutated.
- C.** defective.
- D. vegetative.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

45. Specialized transduction

- A. involves the random transmission of any gene.
- B. involves the transfer of a few specific genes.
- C. utilizes a defective virus.
- D. only involves genes near the viral DNA integration site.
- E. involves the transfer of a few specific genes, utilizes a defective virus AND only involves genes near the viral DNA integration site.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

46. Once inside the host cell, phage DNA

- A. is replicated.
- B. is transcribed.
- C. may get degraded by bacterial nucleases.
- D. All of the choices are correct.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

47. Using phages to treat a bacterial infection is an interesting idea because

- A. a single type of phage can destroy a wide range of strains of the same pathogen.
- B. of the increasing problem of antibiotic resistance.**
- C. lysed bacteria pose no threat.
- D. a single phage can be genetically engineered to infect many different species of bacteria.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

True / False Questions

48. A lysogenic cell contains viral DNA, a prophage, integrated into the host chromosome.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

49.

The integration of phage DNA into host DNA occurs in much the same fashion as seen in transformation, transduction, or conjugation.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

Multiple Choice Questions

50. What are two ways that phage can replicate in harmony (not directly lysing) their host cell?

A.

Conjugation and lysogeny

B.

Lysogeny and transduction

C.

Extrusion and transformation

D.

Extrusion and lysogeny

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

51. What is a defective phage?

A.

A virus that has lost some of its genetic material, and therefore cannot infect a new target cell

B.

A virus that has lost some of its genetic material, and therefore cannot replicate within a new target cell

C.

A virus that lacks the ability to replicate independently of its host cell

D.

A virus that cannot attach to its host cell

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

True / False Questions

52. Filamentous virus is incapable of causing a lytic infection.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

53. Completed filamentous phages are often found in the cytoplasm of infected bacteria.

FALSE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

54. Virulent as well as temperate phages can serve as generalized transducing phages.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

55. Transduction often involves defective virus.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.05

Section: 13.03

Topic: Viruses

56. The restriction-modification system always has two genes involved, the cutting enzyme and the methylating enzyme.

TRUE

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

57. The host range of a virus depends on the presence of host receptor molecules.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

Multiple Choice Questions

58. The nucleocapsid is composed of

- A. DNA and RNA and protein.
- B.** DNA or RNA and protein.
- C. protein located in the nucleus.
- D. nucleic acid in the ribosome.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

59. Enveloped viruses

- A. just require a stamp.
- B.** have an outer lipid bilayer membrane containing various proteins.
- C. are surrounded by an additional layer of carbohydrate.
- D. envelope a cell.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

60. The term "segmented" refers to viruses that
- A. may contain several pieces of RNA.
 - B. have an icosahedral-shaped capsid.
 - C. are linked together before budding out.
 - D. have an envelope.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

61.

The terms helical, icosahedral, and complex refer to

- A. viral life cycles.
- B. forms of nucleic acid.
- C. types of viral envelopes.
- D. shapes of viruses.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

62. Animal viruses are divided into a number of families whose names end in

- A. -virus.
- B. -viridae.
- C. -viscous.
- D. -eieio.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

Chapter 13 - Viruses, Viroids, and Prions

63.

There are _____ major families of DNA containing viruses that infect vertebrates.

A.

2

B.

4

C.

5

D.

7

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

Chapter 13 - Viruses, Viroids, and Prions

64.

There are _____ major families of RNA containing viruses that infect vertebrates.

A.

2

B.

5

C.

7

D.

13

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

65. Viruses are commonly referred to by their _____ name.

A. locale

B. genus

C. disease

D. species

E. disease AND species

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

66. The common species name of the virus is based on the
- A. presence or absence of a nuclear membrane.
 - B. type of nucleic acid it contains.
 - C. disease the virus causes.
 - D. geographic area it is found.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

Bloom's Level: 1. Remember

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

67. The family to which the *Rhinovirus* belongs is the
- A. *Picornaviridae*.
 - B. *Enterovirus*.
 - C. *Enteroviridae*.
 - D. *Picornavirus*.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Learning Outcome: 13.02

Section: 13.01

Topic: Viruses

68. A key feature of all viral infections is the
- A. integration of viral DNA into host DNA.
 - B. disintegration of host DNA.
 - C. addition of a lipid membrane to the virus.
 - D. separation of viral nucleic acid from the capsid.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

Bloom's Level: 1. Remember

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

69. An infection in which the virus is continually present in the body is referred to as
- A. acute.
 - B. balanced.
 - C. determinant.
 - D.** persistent.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

70. Attachment of animal viruses to the host cell may be by means of
- A. a tail.
 - B. the envelope.
 - C. a capsid.
 - D.** spikes.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

71. The receptors to which animal virus attachment proteins usually bind are
- A. proteins.
 - B. carbohydrates.
 - C. nucleic acid.
 - D. lipids.
 - E.** glycoproteins.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

72. Resistance of some animals to certain viral diseases is based on

- A. lack of spikes for attachment.
- B. phagocytosis of the virus by the host cell.
- C. the presence of the viral envelope.
- D.** lack of specific receptors on the host cell.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

73. When an enveloped virus adsorbs to the host cell with its protein spikes, the virions are taken into the cell by the process of

- A. penetration.
- B. production.
- C. fusion.
- D.** endocytosis.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

74. Bacteriophages and animal viruses

- A. both may enter a host cell by endocytosis.
- B. both may enter a host cell by fusion.
- C. both involve entry of the entire nucleocapsid.
- D.** differ because bacteriophages leave the capsid outside the cell, while animal virus entry involves the entry of the whole nucleocapsid.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

75. For which of the following processes are enzymes not required?

A.

Replication

B.

Translation

C.

Maturation

D.

Self-assembly

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

76. Cells infected with animal viruses lyse because

A. the release of the virions depletes the cell of energy.

B. the virus releases enzymes that lyse the cell.

C. functions necessary for cell survival are not carried out and the cell dies.

D. the virus RNA and cellular protein interact to kill the cell.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

77. In addition to lysis, animal viruses may exit the host cell by

- A. extrusion.
- B. budding.**
- C. fission.
- D. fusion.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

78. In the region of budding, the inside of the plasma membrane becomes coated with

- A. enzymes.
- B. carbohydrates.
- C. steroids.
- D. matrix proteins.**

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

79.

In the region of budding, the plasma membrane acquires

- A. carbohydrates.
- B. spike proteins.
- C. matrix proteins.
- D. enzymes.
- E.** spike proteins AND matrix proteins.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

80. The enveloped viruses typically obtain their envelope

- A. from the host plasma membrane.
- B. as they exit the host.
- C. from a newly constructed viral-derived membrane.
- D. from the nuclear membrane.
- E.** from the host plasma membrane AND as they exit the host.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

81. Carriers

- A. may have a persistent infection.
- B. may be a source of infection.
- C. usually show symptoms of the disease.
- D. have been cured of the infection.
- E.** may have a persistent infection AND may be a source of infection.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

82. In latent infections, the virions are

- A. constantly produced.
- B.** only produced during reactivation.
- C. produced slowly.
- D. continually being slowly budded out.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

83. The best known chronic infection involves

- A. chickenpox.
- B. herpes.
- C. hepatitis A.
- D.** hepatitis B.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

84. The genome of retroviruses is made of

- A. ssDNA.
- B. dsDNA.
- C. ssRNA.
- D. dsRNA.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

85. The best-known examples of viruses that cause latent infections are

- A. polio.
- B. herpes.
- C. measles.
- D. chickenpox.
- E. herpes AND chickenpox.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

86. Diseases of short duration frequently followed by long-term immunity are referred to as

- A. intermittent infections.
- B. chronic infections.
- C. acute infections.
- D. persistent infections.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

87. Retroviruses are unique in that they
- A. replicate in nervous system cells.
 - B. do not have a capsid.
 - C. use RNA as a template to make DNA.
 - D. use DNA as a template to make RNA.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

88. Genetic exchange in segmented viruses that allows a zoonotic virus to infect humans is termed
- A. antigenic shift.
 - B. hemagglutination.
 - C. genetic reassortment.
 - D. antigenic drift.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

89. Cells taken from a tumor
- A. may be used to grow viruses.
 - B. can be cultivated *in vitro* indefinitely.
 - C. may be used to grow bacteriophages.
 - D. divide 50 times and then die.
 - E. may be used to grow viruses AND can be cultivated *in vitro* indefinitely.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

90. Viruses may not be cultivated in

- A. live organisms.
- B. embryonated chicken eggs.
- C. tissue culture.
- D. blood agar.**

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

91.

The changes that occur in virally infected cells are characteristic for a particular virus and are referred to as the

- A. cytopathic effect.**
- B. phenotypic effect.
- C. genotypic expression.
- D. cytology.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

92. After growth in tissue culture, the infected cells lyse and the virus may be harvested from **A.**

the lysate, the liquid supernatant after centrifugation.

B. the remainder.

C. the quantal layer.

D. the monolayer.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

93. Normal tissue taken from animals and prepared immediately as media for viral growth is termed a(n)

A. advantageous group.

B. monolayer culture.

C. plaque.

D. primary culture.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

94. If reasonably pure preparations of virus are available, the number of virus present may be determined by

- A. photocolorimetry.
- B. gas chromatography.
- C. light microscopy.
- D.** electron microscopy.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

95. The approximate viral concentration of a sample may be determined by

- A.** quantal assay.
- B. endpoint assay.
- C. the titer.
- D. the lysate assay.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

96. The concentration of virus that infects or kills 50% of the host cells is referred to as the

- A. LD₅₀.
- B. ID₅₀.
- C. ID₁₀₀.
- D. LD₁₀₀.
- E.** LD₅₀ AND ID₅₀.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

97. One group of animal viruses that are able to agglutinate red blood cells are the

A. coronavirus.

B. retrovirus.

C. reovirus.

D.

orthomyxovirus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

98.

The site at which a virus has infected and subsequently lysed the infected cell, releasing its progeny to infect and lyse surrounding cells, thereby forming a "clear zone," is

A. a burst area.

B. a lyse area.

C. a plaque.

D. a dead zone.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

99. Which of the following is not a characteristic of normal cells?

- A. They grow as a monolayer.
- B. They grow as multiple layers.**
- C. They undergo a limited number of divisions and then die.
- D. They stick tightly to the surface of glass culture dishes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

100. Plant viruses enter the host plant via

- A. wound sites.**
- B. specific receptors.
- C. nonspecific receptors.
- D. seeds.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.14

Section: 13.10

Topic: Viruses

101. Plant viruses may be transmitted by

- A. worms.
- B. contaminated seeds.
- C. humans.
- D. insects.
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.15

Section: 13.10

Topic: Viruses

102. Prions

A. replicate by converting normal host proteins into prion proteins.

B.

responsible for "mad cow disease" can cause a similar disease in humans.

C. can be transmitted by consumption of dried or cooked food.

D. that cause Spongiform Encephalopathy have the same amino acids but different folding properties from PrP^c.

E.

All of the above.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

Bloom's Level: 2. Understand

Learning Outcome: 13.18

Section: 13.11

Topic: Infection and Disease

103. Prions

A. consist of a special nucleocapsid.

B. are made of protein only.

C. are made of RNA only.

D. are made of dsRNA and protein.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 13.16

Section: 13.11

Topic: Infection and Disease

104. Prions affect the
- A. respiratory system.
 - B. gastrointestinal tract.
 - C. nervous system.**
 - D. lymphatic system.

ASM Topic: Module 04 Information Flow
Bloom's Level: 2. Understand
Learning Outcome: 13.18
Section: 13.11
Topic: Infection and Disease

105. Viroids characteristically are composed of
- A. ssRNA.**
 - B. dsRNA.
 - C. ssDNA.
 - D. dsDNA.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.
ASM Topic: Module 04 Information Flow
Bloom's Level: 1. Remember
Learning Outcome: 13.16
Section: 13.11
Topic: Infection and Disease

106. Viroids cause disease in
- A. animals.
 - B. plants.**
 - C. bacteria.
 - D. fungus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.
ASM Topic: Module 05 Systems
Bloom's Level: 1. Remember
Learning Outcome: 13.16
Section: 13.11
Topic: Infection and Disease

107. Prions are

- A. a form of RNA virus.
- B. a form of DNA virus.
- C. a viroid.
- D.** an infectious protein.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 1. Remember

Learning Outcome: 13.16

Section: 13.11

Topic: Infection and Disease

108. Spongiform encephalopathy occurs in

- A. humans.
- B. cattle.
- C. sheep.
- D.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 13.17

Section: 13.11

Topic: Infection and Disease

True / False Questions

Chapter 13 - Viruses, Viroids, and Prions

109.

Bacteriophage, unlike animal viruses, often have special viral-specific enzymes carried in the capsid, which enter the host cell at the same time as the nucleic acid.

FALSE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

110.

The structure of plant, animal, and bacterial viruses are each, fundamentally, very different from one another.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

111.

Capsids are made of a number of capsomeres that are covalently bonded to one another.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

Chapter 13 - Viruses, Viroids, and Prions

112.

Non-enveloped and enveloped viruses both may enter the host via endocytosis.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

113. All viruses must separate the nucleic acid from the capsid before replication.

TRUE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.01

Section: 13.01

Topic: Viruses

114. If a virus utilizes a lytic life cycle of reproduction, it will not induce tumors.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.11

Section: 13.08

Topic: Viruses

115. Viruses that cause acute infection result in productive infections.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 13.10

Section: 13.07

Topic: Viruses

116. Electron microscopy is useful for counting viruses and distinguishing between infective and non-infective virions.

FALSE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

117. Infective and non-infective viruses may be distinguished by growth on MacConkey's agar.

FALSE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.12

Section: 13.09

Topic: Viruses

Multiple Choice Questions

118. An antibiotic is added to a culture of *E. coli*, resulting in death of the cells.

Bacteriophage are then added. Would the phage replicate in the *E. coli* cells? Why or why not?

A. Yes, because the machinery inside the cells is most likely still active, even though the cells are no longer living. The virus could use that machinery to replicate new virus particles.

B. No, because the virus would depend too much on having the active machinery of a living cell for its replication. Without the ability of the cell to try to replace what is lost/damaged/used as the virus goes through its life cycle, the virus couldn't reproduce effectively.

C. Yes, because viruses are capable of reanimating dead cells to force them to produce more virus particles.

D. No, because entry of the virus into the target cell is dependent on the cell being alive to conduct endocytosis of the virus.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 13.03

Section: 13.02

Topic: Viruses

119. Most temperate phages integrate into the host chromosome, whereas some replicate as plasmids. Which kind of relationship do you think would be more likely to maintain the phage in the host cell, and why?

A. Plasmids-they're smaller, so they'd be easier to replicate by the host cell.

B.

Integrated-the host cell would be less likely to view this DNA as "foreign" on subsequent rounds of replication, and would retain it more easily.

C. Plasmids-these structures often carry other genes that may give the host cell a selective advantage over cells that don't have them.

D.

Integration-because plasmids are frequently lost during cell division, which could leave a daughter cell without the virus genome.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

Bloom's Level: 5. Evaluate

Learning Outcome: 13.04

Section: 13.02

Topic: Viruses

120.

The clustered, regularly interspaced short palindromic repeats (CRISPR) system in bacterial cells has been called the “immune” system of bacteria. CRISPR protect bacteria from a repeat infection from the same phage because bacterial cells

A.

recognize proteins on the surface of the phage and secrete enzymes that digest the phage.

B.

recognize proteins on the surface of the phage and secrete proteins that block the binding of the phage.

C.

integrate fragments from the phage DNA in their own chromosomes and target for destruction any DNA that contains the same fragments in the future.

D.

modify the attachment sites for the phages so that new infections cannot take place.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

121. You add an unknown phage to a mixture of F^+ and F^- cells of *E. coli* and plate out the bacteria. The bacterial colonies that grow are all F^- . How can you explain this phenomenon?

- A.** The phage bound to a receptor on the sex pilus, and therefore only infected the F^+ cells (leaving the F^- cells alone).
- B. The phage bound to a receptor on the F^- cells, leaving only them alive and allowing the F^+ cells to die off.
- C. The phage integrated (lysogenized) the F^- cells, giving them a selective advantage over the F^+ cells.
- D. F^+ cells are uniquely susceptible to phage attack for unknown reasons.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

122. A mutation in *E. coli* results in the loss of both restriction endonucleases and modification enzymes. Would you expect any difference in the frequency of gene transfer via transduction **FROM** *Salmonella* **INTO** this *E. coli* strain?

A. No-since the *Salmonella* strain is normal, the rate of production of transducing virus particles would still be the same, resulting in the same frequency of gene transfer.

B.

Yes-the loss of the restriction endonucleases would leave the recipient *E. coli* unable to break down "invading" viral DNA from the transducing phage. This would lead to higher rates of successful transduction.

C.

Yes-the loss of the modification enzymes would leave the recipient *E. coli* unable to tag its own DNA as "self," leaving the viral DNA untagged and recognizable as "foreign," and targeted for destruction. This would lead to higher rates of successful transduction.

D. No-transduction efficiency isn't affected by either restriction endonucleases or modification enzymes, so there'd be no effect on the overall rate.

E.

Yes-the loss of the restriction endonucleases would leave the recipient *E. coli* unable to break down "invading" viral DNA from the transducing phage, AND the loss of the modification enzymes would leave the recipient *E. coli* unable to tag its own DNA as "self," leaving the viral DNA untagged and recognizable as "foreign," and targeted for destruction. Together, these would lead to higher rates of successful transduction.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Bloom's Level: 5. Evaluate

Learning Outcome: 13.06

Section: 13.04

Topic: Viruses

123. Why do animal viruses have envelopes and phages rarely do?

- A. Since bacteria don't have cell membranes, the bacterial viruses (phages) don't pick them up when they leave the target cells.
- B. Phages acquire an outer surrounding that is a part of the cell wall of the bacterium they were created in, rather than an outer surrounding of plasma membrane.
- C.** Animal viruses will often utilize the envelope in order to fuse with the plasma membrane of a new target cell, gaining entry into the cytoplasm.
- D. Animal viruses build the envelope inside of the target cell as they are being replicated, but before the cell breaks open and releases them into the extracellular environment. The envelope is a remnant of this building process.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

124. Explain why HIV becomes resistant so quickly when a single drug is used therapeutically.

- A. The virus is an RNA genome virus-by using host RNA polymerase to directly copy the genome to make more virus particles, there's no proofreading capability. This leads to a high rate of mutation of the viral genome and increased chance for drug resistance.

B.

HIV utilizes reverse transcriptase to make a cDNA version of its RNA genome. This polymerase is "sloppy," with a high rate of error and lack of a proofreading capability. This leads to a high rate of mutation of the viral genome and increased chance for drug resistance.

- C. HIV synthesizes a protein enzyme that directly cleaves anti-HIV drugs, giving it a characteristically high rate of resistance to a single drug type.

- D. HIV is constantly changing its genetic structure by swapping genetic elements with other virus strains. This leads to a high rate of mutation of the viral genome and increased chance for drug resistance.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

125. Why is it not surprising that AIDS patients frequently suffer a viral-induced tumor?

- A.** HIV genomes integrate into the host cell chromosome. This integration might result in loss of control of the cell cycle (also known as cancer).
- B. The immune system's CD4⁺ T cells are directly responsible for elimination of tumor cells. HIV attacks them and eliminates them, making a person more susceptible to cancer.
- C. The therapies for HIV are highly mutagenic, which may lead to cancerous states in people taking the drug regimen.
- D. Products of an active HIV infection are highly mutagenic-so, as a person's illness progresses, these mutagenic compounds build up and are more capable of inducing a cancerous state.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 13.11

Section: 13.08

Topic: Viruses

126. Is antigenic shift alone likely to lead to influenza pandemics?

- A. Yes-ONLY antigenic shift can lead to the large-scale mixing of gene elements required to produce a pandemic flu strain.
- B. No-ONLY antigenic DRIFT can lead to the large-scale mixing of gene elements required to produce a pandemic flu strain.
- C.** Perhaps-but it would most likely be a mixture of antigenic shift AND drift that would result in a pandemic strain.
- D. No-antigenic SHIFT is responsible for changes in the hemagglutinin protein, while antigenic DRIFT is responsible for changes in the neuraminidase protein. You must have changes in both to lead to a pandemic strain.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 13.09

Section: 13.06

Topic: Viruses

127. Would you expect the number of virions to be the same if you measured them by the plaque assay or by counting using the electron microscope? Why?

A. Yes-both methods measure the total number of virus particles in a solution.

B. No-the plaque assay only measures viable virus particles, while the electron microscope cannot distinguish between defective and viable virus.

C. No-you cannot count virus particles by using a plaque assay. You can only get a relative difference in quantity from one preparation of virus particles to another with this method.

D. Yes-only fully functioning viruses will be released from a host cell, so the quantified number of virus particles in a plaque assay should be identical to the number of free virus particles counted by electron microscopy within a given preparation.

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

128. Why are viroids resistant to nucleases?

A.

Having a circular RNA "genome," they are resistant to the digestion of most exonucleases (that nibble/digest the free ends of RNA or DNA).

B.

Having a circular RNA "genome," with no protein shell, they are resistant to the protein-degrading activities of nucleases.

C. Nucleases will only digest DNA, not RNA-so viroids are protected.

D. Viroids have only been identified in plants. Plant nucleases cannot digest RNA.

ASM Objective: 04.04 The synthesis of viral genetic material and proteins is dependent on host cells, and these processes can be different among viruses.

ASM Topic: Module 04 Information Flow

Bloom's Level: 5. Evaluate

Learning Outcome: 13.16

Section: 13.11

Topic: Viruses

129. Would ID₅₀ and LD₅₀ necessarily be the same for a given virus? Why or why not?

A. Yes, because the number of viruses that infect 50% of a test population should also kill 50% of that test population.

B. No, because a virus may be highly infectious (very low ID₅₀ value) but only marginally lethal (very high LD₅₀ value). A prime example of this is the rhinovirus (common cold virus).

C.

No, because very few viruses are lethal, yet many are highly infectious. The two values should ALWAYS be different.

D. Yes, because what we're actually describing here is infection/killing of individual CELLS, not of entire organisms. If a cell is infected, it will always be killed.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 13.13

Section: 13.09

Topic: Viruses

130. Why is it virtually impossible to stamp out a disease caused by a zoonotic virus?

A. You'd have to drive the vector organism extinct to do so.

B. Many vector organisms have multiple stages of their life cycle that can carry a zoonotic virus, which complicates controlling the vector-borne transmission.

C. Many viruses transmitted in this manner may utilize more than one vector organism.

D.

Many zoonotic viruses may be able to reside in more than one host organism, complicating control measures.

E. All of the above are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 13.08

Section: 13.06

Topic: Viruses

Chapter 14 The Innate Immune Response

Multiple Choice Questions

1. Phagocytes were first discovered and named by
- A. Pasteur.
 - B. Koch.
 - C. Lister.
 - D. Metchnikoff.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.01

Section: 14.01

Topic: History of Microbiology

Chapter 14 - The Innate Immune Response

2. In which organism were phagocytes first reported?

A.

Bacteria

B.

Amoeba

C.

Red blood cells

D.

Starfish larvae

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.01

Section: 14.01

Topic: History of Microbiology

Chapter 14 - The Innate Immune Response

3. Which is not a component of innate immunity?

A.

Skin

B.

Inflammation

C.

Fever

D.

Antibody

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.01

Section: 14.01

Topic: Immunity and Immunization

4. Which is not involved in adaptive immunity?

A. antibody

B. T cell

C. B cell

D. tear flow

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

5. Skin and mucous membranes are mostly involved in

- A. adaptive immunity.
- B. autoimmunity.
- C. irregular immunity.
- D.** innate immunity.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

6. Skin and mucous membranes

- A. are the first line of innate immunity.
- B. are the first line of adaptive immunity.
- C. act as physical barriers to infection.
- D. contain antimicrobial secretions.
- E.**

are the first line of innate immunity, act as physical barriers to infection, AND contain antimicrobial secretions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

7. Interferons, complement, lysozyme, and lactoferrin are all examples of

- A. specific antimicrobial factors.
- B. immune enzymes.
- C.** nonspecific antimicrobial factors.
- D. cytokines.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

8. Normal microbiota

A.

are the organisms that typically reside on and in your body.

B. protect against infection by pathogens.

C. enhance infection by pathogens.

D. play no role in affecting pathogen growth.

E.

are the organisms that typically reside on and in your body AND protect against infection by pathogens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

9. Iron

A. is required by microorganisms.

B. binds to lactoferrin.

C. is necessary for the functioning of some enzymes.

D. All of the choices are correct.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

10. Factors that work generically against any foreign substance entering the host are described as

- A. innate immunity.
- B. specific immunity.
- C. irregular immunity.
- D. immune metabolism.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.01

Section: 14.01

Topic: Immunity and Immunization

11. The cells primarily involved in all immune responses are the

- A. erythrocytes.
- B. platelets.
- C. osteocytes.
- D. leukocytes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

12. In humans, the stem cells from which all blood cells arise are found in the

- A. peripheral circulation.
- B. lymphatic vessels.
- C. lymph nodes.
- D. bone marrow.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

13. All blood cells originate from the

- A. erythrocyte.
- B. leukocytic stem cell.
- C. eosinophilic stem cell.
- D.** hematopoietic stem cell.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

14. Which of the following is a phagocytic cell found in the human body?

A.

Erythrocyte

B.

Neutrophil

C.

Megakaryocyte

D. T cell

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

15. The leukocyte that contains histamine is the

- A. lymphocyte.
- B. monocyte.
- C. macrophage.
- D.** basophil.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

16. Allergic reactions mainly involve

- A. macrophages.
- B. monocytes.
- C. neutrophils.
- D.** mast cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

17. Which of the following are referred to as mononuclear phagocytes?

A.

Lymphocytes and basophils

B.

Mast cells and eosinophils

C.

Basophils and eosinophils

D.

Monocytes and macrophages

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

18. The leukocyte responsible for adaptive immunity is the

A. lymphocyte.

B. monocyte.

C. eosinophil.

D. neutrophil.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

19.

The "voices" of a cell, which carry messages, are

- A. surface receptors.
- B. platelets.
- C. cytokines.
- D. antigens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.04

Section: 14.04

Topic: Immunity and Immunization

20. Toll-like receptors

- A. are cytokines.
- B. each recognize a specific "danger" molecule.
- C.

are embedded in cellular membranes.

D. are part of adaptive immunity.

E.

each recognize a specific "danger" molecule AND are embedded in cellular membranes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.06

Section: 14.05

Topic: Immunity and Immunization

21. Complement

- A. may be activated through three pathways.
- B. disrupts the cytoplasmic membrane of invading bacteria and foreign cells.
- C. is part of the specific defense system.
- D. is a group of blood proteins.
- E.**

may be activated through three pathways, disrupts the cytoplasmic membrane of invading bacteria and foreign cells, AND is a group of blood proteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

22. The complement pathway that requires antibodies to be activated is the

- A. alternate pathway.
- B.** classical pathway.
- C. properdin pathway.
- D. inflammatory pathway.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

23. A group of interacting serum proteins that provide a nonspecific defense mechanism is

- A.** complement.
- B. interferon.
- C. glycoprotein.
- D. lysozyme.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

24. The complement pathway that is activated by mannan-binding lectins is the
- A. classical pathway.
 - B. alternative pathway.
 - C. C3 pathway.
 - D.** lectin pathway.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

25. The complement pathway that is activated by binding of C3b to cell surfaces is the
- A. classical pathway.
 - B.** alternate pathway.
 - C. C3 pathway.
 - D. mucociliary pathway.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

26. The key molecule upon which all complement pathways converge is
- A. C1.
 - B. C2.
 - C.** C3.
 - D. C6.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

27. C3a and C5a are involved in

- A. inflammation.
- B. interferon production.
- C. properdin activation.
- D.

attraction of phagocytes.

E.

inflammation AND attraction of phagocytes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

28. C3b is involved in

- A.** opsonization.
- B. interferon production.
- C. properdin activation.
- D. endotoxin production.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

29. The complex resulting from complement activity that leads to cell lysis is the
- A. prostaglandin complex.
 - B. leukotriene activating complex.
 - C. membrane attack complex.**
 - D. histamine complex.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

30. Which of the following are most susceptible to complement lysis?
- A. Gram-positive bacteria
 - B. Gram-negative bacteria**
 - C.

Bacteriophages

D.

Prions

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

31. The low molecular weight protein produced by animal cells in response to viral infections is

- A. complement.
- B. lysozyme.
- C. histamine.
- D.** interferon.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

32. Interleukins are

- A. produced by leukocytes.
- B. important in both innate and adaptive immunity.
- C. involved in directly killing tumor cells.
- D. protein molecules.
- E.** produced by leukocytes AND protein molecules.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 14.04

Section: 14.04

Topic: Immunity and Immunization

33. The presence of long double-stranded RNA (> 30 bp)

- A. indicates infection by an RNA virus other than a retrovirus.
- B. indicates infection by a virus.
- C. indicates exposure to mutagens.
- D. induces synthesis of interferon.
- E.** indicates infection by an RNA virus other than a retrovirus AND induces synthesis of interferon.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

34. Interferons function to make cells

A.

prevent viral replication.

B. lyse when exposed to virus.

C. non-motile when infected with virus.

D. resistant to phagocytosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

35. Which of the following cytokines is most antiviral in its action?

A.

Interleukin-1

B.

Interleukin-2

C.

Interferon

D.

Lysozyme

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.04

Section: 14.04

Topic: Immunity and Immunization

36. Which of the following statements about interferon is incorrect?

- A.** It only works on a few specific types of virus.
- B. It makes cells resistant to viral infection.
- C. It is a species specific molecule.
- D. It does not directly inactivate viruses.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

37.

Which activity of the virally invaded cell triggers production of interferon?

A.

Activation of rRNA

B.

Movement of nuclear proteins to the cytoplasm

C.

Production of glycolipids

D.

Production of dsRNA

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

38. The cellular organelle responsible for the digestion of ingested infectious agents is the
- A. endoplasmic reticulum.
 - B. Golgi apparatus.
 - C. phagolysosome.**
 - D. lysosome.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 14.09

Section: 14.07

Topic: Immunity and Immunization

39. Following digestion of a microorganism by phagocytes, the debris is excreted by
- A. ingestion.
 - B. exocytosis.**
 - C. extrusion.
 - D. budding.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.09

Section: 14.07

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

40. The four cardinal signs of inflammation are:

A.

Flare, wheals, fever, cough

B.

Rash, pus, heat, rubor

C.

Heat, pain, vesicles, fever

D.

Redness, heat, swelling, pain

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.11

Section: 14.08

Topic: Immunity and Immunization

41. The first host response to a nonspecific tissue injury is described as

A. inflammation.

B. reaction.

C. antibodies.

D. trauma.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.11

Section: 14.08

Topic: Immunity and Immunization

42. The first kind of leukocyte lured to the site of inflammation is the
A. neutrophil.
B. monocyte.
C. macrophage.
D. basophil.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.10

Section: 14.08

Topic: Immunity and Immunization

43. The attraction of leukocytes to the area on inflammation is referred to as
A. parasitism.
B. infection.
C. phototaxis.
D. chemotaxis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.09

Section: 14.08

Topic: Immunity and Immunization

44. One of the strongest indications of infectious disease is
A. a rash.
B. pustules.
C. vesicles.
D. fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.13

Section: 14.08

Topic: Immunity and Immunization

45. Pyrogens are

- A. fever-inducing substances.
- B. fever-inhibiting substances.
- C. phagocytosis-enhancing substances.
- D. complement activators.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.13

Section: 14.09

Topic: Immunity and Immunization

46.

During apoptosis, a cell will

A.

die because it is damaged and, as a result, cause an inflammatory response.

B.

self-destruct and, as a result, cause an inflammatory response.

C.

self-destruct without causing an inflammatory response.

D.

die because it is accidentally damaged, and, as a result, cause an inflammatory response.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.12

Section: 14.08

Topic: Immunity and Immunization

47. Fever

- A. enhances bacterial growth.
- B. inhibits bacterial growth.
- C. speeds up the body's reactions.
- D. triggers complement.
- E. inhibits bacterial growth AND speeds up the body's reactions.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.13

Section: 14.09

Topic: Immunity and Immunization

True / False Questions

48. Pattern recognition is involved in innate immunity.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 14.05

Section: 14.05

Topic: Immunity and Immunization

49.

Defensins are short antimicrobial peptides found within mucous membranes and phagocytes.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

Chapter 14 - The Innate Immune Response

50.

White blood cells also called leukocytes are important in immunity.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

51. Mast cells are only found in the blood.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

52. Lymphocytes are the cells primarily responsible for the adaptive immune responses.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.03

Section: 14.03

Topic: Immunity and Immunization

53. All pathways of complement activation follow the same sequence after C3.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

54. Gram-negative bacteria are less susceptible to complement lysis than Gram-positive bacteria.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.08

Section: 14.06

Topic: Immunity and Immunization

55. Interferon directly interacts with and destroys viruses.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

56. Neutrophils are the second phagocytic cell to respond to an infection.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.10

Section: 14.07

Topic: Immunity and Immunization

57. Fever often enhances bacterial survival during an infection.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.13

Section: 14.09

Topic: Immunity and Immunization

Multiple Choice Questions

58.

What two functions do phagocytes serve in immune responses?

A.

Production of antibodies AND engulfment/destruction of foreign cells

B.

Engulfment/destruction of foreign cells AND alerting the other cells of the immune system to an invader

C.

Alerting the other cells of the immune system to an invader AND serving as a physical barrier against microbial invasion

D. Production of antibodies AND serving as a physical barrier against microbial invasion.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 14.01

Section: 14.01

Topic: Immunity and Immunization

59. How do cytokines function?

A. They bind directly to microbes to enhance their chance of being ingested (phagocytosed).
B. They are secreted in the phagolysosomes of neutrophils to effect killing of ingested microbes.

C.

They are secreted by one cell type. They then bind to a receptor on target cell causing a signal within that cell that turns on (or off) certain genes to achieve a response.

D. They work as a series of serum proteins to produce a hole in microbes to directly lyse them.

*Bloom's Level: 2. Understand
Learning Outcome: 14.01
Section: 14.01
Topic: Immunity and Immunization*

60. Toll-like receptors (TLRs) bind molecules on pathogens. Why is this helpful to the immune response?

A. It provides a highly specific response to very small and highly unique areas on an individual pathogenic microbe, providing the most specific and selective response possible.

B. It provides a general response to broad categories of molecules/cells that should NOT be in our system, as we don't have these molecules on our own cells.

C. These **secreted** molecules help bind pathogens and then direct them to receptors on the immune system cells that are best capable of eliminating them from our systems. TLRs are delivery mechanisms for the immune responses.

D. TLRs are capable of directly lysing (destroying) the microbes, helping our immune responses by eliminating pathogens.

*ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.
ASM Topic: Module 05 Systems
Bloom's Level: 3. Apply
Learning Outcome: 14.06
Section: 14.05
Topic: Immunity and Immunization*

61. Smoking impairs the ciliated cells of the middle portion of the respiratory tract. Many analgesic drugs (painkillers) impair peristalsis (the churning motion of the digestive tract). The result of either of these activities leads to an increased risk of infection in their respective areas. Why?

- A.** The actions of the cells in these areas help to propel pathogens out of the area, serving as a part of the physical barrier system. When they are impaired/slowed, bacteria and other pathogens have an easier time adhering to the tissues in the area and causing an infection.
- B.** Ciliated cells also line the digestive tract, and these cells secrete strong natural antibacterial compounds. When they are impaired, bacteria can more easily infect these areas.
- C.** Chemicals in cigarette smoke and the chemicals in painkillers impair our immune systems, making us generally more predisposed to infections (regardless of the tissue area).
- D.** Chemicals in cigarette smoke and the chemicals in painkillers impair the ability of our immune system cells to move into areas that are infected. As such, they can't perform their job of eliminating microbes as well as they should and infections result more easily.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 14.02

Section: 14.02

Topic: Immunity and Immunization

62. A physician is attempting new therapies for HIV patients who are suffering from an impaired immune response. He decides to try using a recombinant form of colony-stimulating factor cytokine (CSF). Why?

A. CSF is a strong inducer of antiviral activities in our cells, and may help our immune system fight off the effects of HIV for a longer period of time.

B. CSF will hyperstimulate the activities of the macrophages, leading to ingestion and destruction of HIV-infected cells.

C.

CSF will help to stimulate the production of new lymphocytes-the very cells that are infected and depleted during an HIV infection. This may help to keep the patients' immune responses "normal" for a longer period of time before they succumb to full-blown AIDS.

D. CSF will drive up the production of lactoferrin, a strong antiviral compound produced in our mucus membrane secretions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 14.04

Section: 14.04

Topic: Immunity and Immunization

63. Syphilis was once treated by intentionally infecting the patient with the parasite that causes malaria, a disease characterized by repeated bouts of fever, shaking, and chills. Why might this treatment cure syphilis?

A. Malaria parasites produce strong antibacterial compounds (since they're eukaryotic in nature-they are trying to eliminate their competition for resources). This helps to eliminate ALL bacteria in and on the human body for a short period of time.

B.

Malaria parasites track down and feed upon ALL bacterial cells in the human body as a part of their life cycle. This makes them a "natural antibiotic" of sorts, and highly effective at clearing the bacterial infection of syphilis.

C. One of the side effects of malarial infection is a massive overproduction of macrophages- so many that they become the dominant cell type in the blood (even over red blood cells!). This drives up the ability to ingest and destroy any microbe, including the bacterium that causes syphilis.

D. The effect of driving up the body temperature for periods of time can shut down the temperature-sensitive replication of the bacterium that causes syphilis. This gives the immune system time to eliminate it properly.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 5. Evaluate

Learning Outcome: 14.11

Learning Outcome: 14.13

Section: 14.09

Topic: Immunity and Immunization

64. A cell infected by viruses may die due to the actions of interferons. The same result would occur WITHOUT interferon-any cell infected by a virus would die directly from the virus. Is there any apparent benefit to the host organism from the interferon action?

A. No-interferon is just an evolutionary leftover from a much earlier form of antiviral activity. It has no function now.

B.

Yes-when the interferon acts on a virally infected cell, it shuts down protein production (which shuts down virus replication). Without interferon, virus will kill the cell eventually, but only after it has replicated many times over. Interferons may kill the host cell, but they will also prevent it from being used to replicate virus.

C. Yes-by killing host cells, you limit the number of cells that are available targets for viral infection. This is a good way of preventing viral infection.

D. No-viruses will replicate in cells regardless of the effects of interferons, so their action of killing the cell has no benefit to the host organism during the infection process.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 14.07

Section: 14.05

Topic: Immunity and Immunization

Chapter 15 The Adaptive Immune Response

Multiple Choice Questions

1. The scientist who received the first Nobel Prize in Medicine for his work on antibody therapy was

- A. Koch.
- B. von Behring.**
- C. Jenner.
- D. Roux.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.01

Section: 15.01

Topic: History of Microbiology

2. Proteins that react specifically with the chemical structures in the antigen that induced them are called

- A. determinants.
- B. antibodies.**
- C. proteases.
- D. macropoteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.01

Section: 15.01

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

3. Antibodies are made by

- A. red blood cells.
- B. macrophages.
- C. B cells/plasma cells.**
- D. T cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.01

Section: 15.01

Topic: Immunity and Immunization

4. Cytotoxic T cells primarily are responsible for

- A. humoral immunity.
- B. cell-mediated immunity.**
- C. anamnestic immunity.
- D. producing haptens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.01

Section: 15.01

Topic: Immunity and Immunization

5. Secondary lymphoid organs

- A. are strategically located in the body.
- B. facilitate interactions between cells.
- C. are hematopoietic.
- D. are the site of T cell maturation.
- E. are strategically located in the body AND facilitate interactions between cells.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.02

Section: 15.02

Topic: Immunity and Immunization

6. Epitopes or antigenic determinants

- A. are parts of the antibody molecule.
- B. are T cell receptors.
- C. are a portion of antigen recognized by antibody.
- D. may be approximately 10-25 amino acids in length.
- E. are a portion of antigen recognized by antibody AND may be approximately 10-25 amino acids in length.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

7.

The humoral immune response is delivered by

- A. antibodies.**
- B. T cells.
- C. lymphokines.
- D. antigens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.01

Section: 15.01

Topic: Immunity and Immunization

8. Which of the following is not typical of an antigen?

A.

Low molecular weight

B.

Protein

C.

Foreign

D.

Polysaccharide

E.

Low molecular weight AND protein

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

9.

Specific regions on an antigen molecule to which the immune response is directed are

- A. antigenic determinants.
- B. an autoimmune response.
- C. monomers.
- D. allergens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

10.

Which of the following molecules would be expected to be immunogenic?

A.

Progesterone, a lipid hormone.

B.

Serum albumin, a large protein.

C.

Glucose, a simple sugar.

D.

Linoleic acid, a fatty acid.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

11. Which of the following is/are secondary lymphoid organ(s)?

A.

Thymus

B.

Spleen

C.

Lymph nodes

D.

Bone marrow

E.

Spleen AND lymph nodes

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.02

Section: 15.02

Topic: Immunity and Immunization

12. A term synonymous with antibody is

A. antigen.

B. epitope.

C. determinant.

D. immunoglobulin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

13. Which of the following do not induce a strong immune response?

A.

Lipids

B.

Proteins

C.

Polysaccharides

D.

Simple sugars.

E.

Lipids AND simple sugars.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

14. There are _____ classes of antibody.

A.

one

B.

three

C.

five

D.

seven

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

15. Which of the following antibodies is a pentamer?

A. IgA

B. IgD

C. IgM

D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

16. The chains of an antibody molecule are bonded to one another by
A. disulfide bonds.
B. hydrogen bonds.
C. ionic bonds.
D. oxygen bonds.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

17. Which of the following antibodies is a dimer?
A. IgA
B. IgD
C. IgM
D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

18. The immunoglobulin monomer consists of

A.

four large chains.

B.

two heavy and two light chains.

C.

five light chains.

D.

three heavy and three light chains.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

19. Which class of antibody accounts for the bulk of the circulating antibody?

A. IgA

B. IgD

C. IgG

D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

20. The characteristic function and properties of each class of antibody is determined by the
- A. variable region on the light chain.
 - B. epitope.
 - C. constant region on the light chain.
 - D.** constant region on the heavy chain.
 - E. variable region on the heavy chain.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

21. An IgG molecule has two
- A. heavy chains.
 - B. light chains.
 - C. antibody binding sites.
 - D. antigen binding sites.
 - E.** heavy chains, light chains AND antigen binding sites.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

22. The variable region of an antibody occurs

- A. only on the heavy chains.
- B. only on the light chains.
- C. on one of the light chains.

D.

on all four chains.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

23. Each class of antibody is specifically defined by its

- A.** amino acid sequence of the constant region of the heavy chain.
- B. amino acid sequence of the variable region of the light chain.
- C. ability to cross the placenta.
- D. disulfide bonds.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

24. Antigens interact with antibodies at

- A.** the outer end of each arm of the Y.
- B. the junction of heavy and light chains.
- C. different regions depending on the class of antibody.
- D. the bottom stem of the heavy chain of the Y.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

25. Ag-Ab binding may result in

- A. neutralization.
- B. immobilization.
- C. agglutination.
- D. opsonization.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.05

Section: 15.04

Topic: Immunity and Immunization

26. The Fc region on IgG

- A. interacts with complement.
- B.

attaches to receptors on macrophages.

C. reacts with and coats the antigen.

D. contains a variable region.

E.

interacts with complement AND attaches to receptors on macrophages.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.05

Section: 15.04

Topic: Immunity and Immunization

27. How long after initiation of a primary response do significant amounts of antibody appear in the blood?

A.

One day

B. 10-14 days

C. 4 weeks

D. 6 months

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.09

Section: 15.06

Topic: Immunity and Immunization

28. The only class of antibody that can cross the placenta is

A. IgA.

B. IgD.

C. IgG.

D. IgE.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

29. Which is the first antibody class made during the primary response to an antigen?

A. IgA

B. IgM

C. IgG

D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

30. Which of the following is the most abundant immunological class produced?

- A. IgA
- B. IgD
- C. IgG
- D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

31. Which is the most efficient at initiating the classical pathway of the complement cascade?

- A. IgA
- B. IgD
- C. IgM
- D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

32. Which of the following class of antibody is primarily found in external secretions?

- A. IgA
- B. IgD
- C. IgG
- D. IgE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

33. The function of the secretory component of the IgA molecule is
A. to protect IgA from being destroyed by proteolytic enzymes.
B. to coat the antigen.
C. opsonization.
D. to fix IgA to the antigen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

34. The immunoglobulin that is important in hypersensitivity reactions is
A. IgA.
B. IgD.
C. IgG.
D. IgE.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

35. According to the clonal selection theory
A. antibodies are modified, at the time of antigen exposure, to specifically react with the antigen.
B. self-reactive T cells are killed in the thymus.
C. B cells producing autoantibodies are eliminated in the thymus.
D. each B cell is already programmed to produce a specific antibody.
E. self-reactive T cells are killed in the thymus AND B cells producing autoantibodies are eliminated in the thymus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.07

Section: 15.05

Topic: Immunity and Immunization

36. "Clonal selection" and "clonal expansion"

A. implies that each individual lymphocyte produces a single antibody.

B.

describes how a single lymphocyte proliferates in a population of effector cells.

C. depends on an antibody recognizing a specific epitope.

D.

explain how an antigen stimulates the production of matching antibodies.

E. All of the above

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.07

Section: 15.05

Topic: Immunity and Immunization

37.

T cells and B cells are produced in the

A. bone marrow.

B. thymus.

C. Peyer's patches.

D. nervous tissue.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 15.02

Learning Outcome: 15.05

Section: 15.02

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

38. T cells mature in the

- A. bone marrow.
- B. thymus.**
- C. Peyer's patches.
- D. nervous tissue.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.02

Section: 15.02

Topic: Immunity and Immunization

39. The cells that actually secrete antibodies are

- A. plasma cells.**
- B. natural killer cells.
- C. phagocytes.
- D. T cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.07

Section: 15.05

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

40.

CD4 cells are also known as ...

A. T helper cells.

B.

natural killer cells.

C. T cytotoxic cells.

D.

macrophages.

E.

neutrophils.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.13

Section: 15.07

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

41.

CD8 cells are

A. T helper cells.

B.

natural killer cells.

C. T cytotoxic cells.

D.

macrophages.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.13

Section: 15.07

Topic: Immunity and Immunization

42. Antigens may be processed for presentation by

A. macrophages.

B. dendritic cells.

C. erythrocytes.

D. T cytotoxic cells.

E. macrophages AND dendritic cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.12

Section: 15.07

Topic: Immunity and Immunization

43. Macrophages and dendritic cells are

- A. T cells.
- B. B cells.
- C. antigen-presenting cells.**
- D. antibody-producing cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.12

Section: 15.07

Topic: Immunity and Immunization

44. Only antigen-presenting cells

- A. produce antibodies.
- B. activate cytotoxic T cells.
- C. produce MHC class I molecules.
- D. produce MHC class II molecules.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

45. It would be useful if antigens were delivered directly to

- A. Peyer's patches.
- B. W Cells.
- C. M cells.
- D. red blood cells.
- E. Peyer's patches AND M cells.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.02

Section: 15.02

Topic: Immunity and Immunization

46. Class II MHC molecules are found primarily on

- A. macrophages.
- B. dendritic cells.
- C. erythrocytes.
- D. T cytotoxic cells.
- E. macrophages AND dendritic cells.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

47. The stimulation of B cells to divide and mature is provided by

- A. T helper cells.**
- B. macrophages.
- C. T cytotoxic cells.
- D. plasma cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.08

Section: 15.06

Topic: Immunity and Immunization

48. The peptides presented by MHC class II peptide molecules are

- A. from plasma cells.
- B. exogenous antigens.**
- C. endogenous antigens.
- D. from T helper cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.12

Section: 15.07

Topic: Immunity and Immunization

49. T-independent antigens

- A. include polysaccharides.
- B. require the involvement of T cells.
- C. interact with MHCI molecules.
- D. are usually proteins.
- E. include polysaccharides AND are usually proteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.10

Section: 15.06

Topic: Immunity and Immunization

50. Memory cells may take the form of

- A. B cells.
- B. T cytotoxic cells.
- C. T helper cells.
- D. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.09

Section: 15.06

Topic: Immunity and Immunization

51. The surface receptors on B and T cells both

- A. play the same role in each type of cell.
- B. bind to free antigen.
- C. have two binding sites for antigen.
- D. have variable and constant regions.
- E. play the same role in each type of cell AND have two binding sites for antigen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

52. Which is involved in reacting to virus-infected cells?

A.

Cell-mediated immunity

B. T cytotoxic cells

C. B cells

D. MHC I

E.

Cell-mediated immunity, T cytotoxic cells, AND MHC I

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.13

Section: 15.07

Topic: Immunity and Immunization

53. Perforin is produced by

A. B cells.

B. macrophages.

C. NK cells.

D. T helper cells.

E. macrophages AND NK cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.14

Section: 15.08

Topic: Immunity and Immunization

54. Giant cells are

- A. a fusion of B cells.
- B. a fusion of T cells.
- C. used to contain bacterial infections.
- D. activated T helper cells.
- E. a fusion of T cells AND used to contain bacterial infections.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.13

Section: 15.07

Topic: Immunity and Immunization

55. Apoptosis

- A. is a form of cell suicide.
- B. is induced in target cells by effector T cytotoxic cells.
- C. results in T cell death.
- D. refers to the transformation of B cells into plasma cells.
- E. is a form of cell suicide AND is induced in target cells by effector T cytotoxic cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.13

Section: 15.07

Topic: Immunity and Immunization

True / False Questions

56. The immune response is directed against an entire molecule.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

57. All antigens are immunogens.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

58. Antibody molecules are very rigid in structure.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

59. Antibody and antigen are held to one another by covalent bonds.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.04

Section: 15.04

Topic: Immunity and Immunization

60. IgA is the most abundant immunoglobulin made by the body.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 15.06

Section: 15.04

Topic: Immunity and Immunization

61. Gene rearrangement is responsible for the generation of the various antibody molecules.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 04 Information Flow

Bloom's Level: 2. Understand

Learning Outcome: 15.15

Section: 15.09

Topic: Immunity and Immunization

62. T cells are responsible for directly manufacturing antibodies.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.01

Section: 15.01

Topic: Immunity and Immunization

63. T cell receptors are identical to antibodies.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

64. T cell independent antigens lead to a memory response.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

Multiple Choice Questions

65.

How is the central portion of a T cell receptor complex functionally analogous to the center of the B cell receptor complex?

A.

It has two pieces (chains), just like a B-cell receptor.

- B.** Both receptors bind epitopes (small amino acid sections of antigen molecules).
- C. Both bind structures directly on the surface of microbes.
- D. Both can be secreted from lymphocytes to bind to pathogens under certain situations.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

66. How is a T-cell receptor different from a B-cell receptor?

- A.** T-cell receptors must have antigen broken down inside a cell and presented to them by a Major Histocompatibility Complex (MHC) molecule.
- B. B-cell receptors must have antigen broken down inside a cell and presented to them by a Major Histocompatibility Complex (MHC) molecule.
- C. T-cell receptors are composed of 4 protein chains (pieces), while B-cell receptors are composed of only 2 pieces.
- D. T-cell receptors are eventually secreted into the bloodstream by activated T-cells, whereas B-cell receptors are not; they always stay with the B-cell.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.11

Section: 15.07

Topic: Immunity and Immunization

67. Why would a person who has their tonsils removed be more susceptible to certain types of infections of the throat and respiratory tract?

A. Tonsils produce high levels of lactoferrin, a strong natural antibacterial compound.

B. Tonsils produce large amounts of interferons, natural antiviral compounds.

C. Tonsils are secondary lymphoid organs-they help to provide a constant response to the microbes in the oral cavity, helping to keep them in check and preventing them from spreading to other areas.

D. Tonsils are the location where T cells develop and mature. Without them, a person won't have T cells, and will be more likely to suffer from infections that would normally be eliminated by such cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.02

Section: 15.02

Topic: Immunity and Immunization

68. Would a denatured antigen be expected to have the same epitopes as its native (non-denatured) counterpart? Why?

A. Yes-epitopes are just a sequence of amino acids in a row, so they do not change regardless of 3D shape of the protein molecule they lie within.

B. No-ALL epitopes are dependent on being in the proper original 3D conformation in the protein they arise within. Denaturing them would destroy them by destroying that conformation.

C.

Yes AND No-SOME epitopes are dependent on 3D conformation (conformational epitopes), while some simply depend on the sequence of amino acids (linear epitopes). So, really, it depends on the particular epitope.

D. Yes-all proteins must be broken down into individual epitopes for presentation to B and T cells on MHC molecules, so each antigen protein MUST be denatured to yield ANY epitopes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.03

Section: 15.03

Topic: Immunity and Immunization

69. In opsonization with IgG, why would it be important that IgG react with the antigen BEFORE a phagocytic cell recognizes the antibody molecule?

A.

If the IgG is bound to the phagocyte BEFORE opsonization, it would most likely be ingested by the phagocyte before it could bind to a pathogen (it would be "naked," so to speak).

B. Binding of IgG by phagocytes would block the antigen binding sites on the IgG molecules, preventing them from binding to the microbes.

C. Binding of IgG by phagocytes changes their conformation-and by changing their protein conformation, their antigen binding sites are changed and they can no longer recognize their specific antigenic epitopes.

D. Binding of antibody by phagocytes results in immediate release of protein-destroying enzymes to the outside of the cell. Since antibodies are proteins, they would be destroyed by these enzymes (and would then be unable to bind to their specific antigenic epitopes).

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.05

Section: 15.04

Topic: Immunity and Immunization

Chapter 15 - The Adaptive Immune Response

70.

A scientist reports the isolation of a new blood-borne virus that completely shuts down presentation of viral epitopes on MHC molecules in the cells it infects. He produces an internet video describing it and how it will be indestructible by CD8+ cytotoxic T cells and will kill millions (if not billions) of people. The medical community quickly denounces the dire warning as irrelevant, and the whole thing is quickly forgotten-why?

A.

CD8+ T cells are not the cells that are responsible for killing virally infected cells. The terrorist mad scientist is a misinformed idiot.

B.

While CD8+ T cells ARE important for eliminating a viral infection, they are not the ONLY things that are capable of doing so. Natural killer cells can kill virally infected cells that have shut down MHC antigen presentation, and interferons can assist in cleaning virally infected cells.

C.

A blood-borne virus would not be capable of rapidly infecting millions of people, due to its difficult mode of transmission.

D.

B cells would be primed right away to produce complement proteins to destroy the virus. This would prevent cells from being infected with it in the first place. His plot would be foiled.

E.

While CD8+ T cells ARE important for eliminating a viral infection, they are not the ONLY things that are capable of doing so. Natural killer cells can kill virally infected cells that have shut down MHC antigen presentation, and interferons can assist in cleaning virally infected cells AND a blood-borne virus would not be capable of rapidly infecting millions of people, due to its difficult mode of transmission.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.14

Section: 15.08

Topic: Immunity and Immunization

71. The best possible analogy available below for the way in which variable (V), diversity (D), and joining (J) antibody gene segments get put together to create the diversity possible in hypervariable regions is

A.

to think of the various segments as a deck of cards-when you get dealt a hand of five cards, you have a very high likelihood of getting a different hand every time. The quality of the hand you have dealt will dictate whether you have a "winning" hand (capable of binding to antigenic epitopes).

B. to think of the various segments as the pieces of a house-you need a strong foundation first (the joining segments), followed by a frame (the diversity segments), then the interior walls (the variable segments) before the structure is complete.

C. to think of the various segments as building a highway-you need to prepare the area first by clearing a path (the joining segments do this), then grade/slope the area (the diversity segments) before you can finally lay down the asphalt (the variable segments).

D.

to think of the various segments as a bingo game-each segment is randomly selected, but you're going to need one of each V, D, and J to form a functional molecule. The "right" combination varies depending on which antigen is eventually going to be binding to the molecule (i.e., your bingo card would be the eventual antigen, and the random calling out of the number/letter combinations would be the forming of the VDJ hypervariable region).

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 15.15

Section: 15.09

Topic: Immunity and Immunization

Chapter 16 Host-Microbe Interactions

Multiple Choice Questions

1. The connection between a particular organism and a specific disease was first made by
A.

Jenner.

B. Pasteur.

C. Koch.

D. Leeuwenhoek.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: History of Microbiology

2. The series of steps used to connect an organism to a disease are known as

A. Pasteur's postulates.

B. Lister's aseptics.

C. Linnaeus taxonomics.

D. Koch's postulates.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: History of Microbiology

Chapter 16 - Host-Microbe Interactions

3.

The interaction of all organisms within a biological community with their environment is called a(n)

A.

group.

B.

cluster.

C. ecosystem.

D.

network.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.01

Section: 16.01

Topic: Pathogenesis

4. The microorganisms that are regularly found in or on the body, yet do no apparent harm are called

A.

abnormal microbiota.

B.

transient microbiota.

C.

variant microbiota.

D.

normal microbiota.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.02

Section: 16.02

Topic: Pathogenesis

5. The microorganisms that are occasionally found in or on the body are called

A.

abnormal microbiota.

B.

transient microbiota.

C.

variant microbiota.

D.

normal microbiota.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.02

Section: 16.02

Topic: Pathogenesis

6. Organisms that are found together and interact on a more or less permanent basis are in a relationship termed

A. mutualism.

B. parasitism.

C. symbiosis.

D.

transient microbiota.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: Pathogenesis

7. The symbiotic relationship wherein both partners benefit is termed

- A. commensalism.
- B. parasitism.
- C. independence.
- D. mutualism.**

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: Pathogenesis

8. A relationship in which one partner benefits and the other is unaffected is termed

- A. commensalism.**
- B. parasitism.
- C. independence.
- D. mutualism.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: Pathogenesis

9. A relationship in which one partner benefits and the other is harmed is termed

- A. commensalism.
- B. parasitism.**
- C. independence.
- D. mutualism.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.01

Section: 16.01

Topic: Pathogenesis

Chapter 16 - Host-Microbe Interactions

10.

Newborn babies acquire microbiota by

A.

passing through the birth canal.

B.

breastfeeding.

C.

contact with mother's skin.

D.

environment.

E.

All of the above are a source of microbiota.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.03

Section: 16.02

Topic: Pathogenesis

11.

Which of the following is true about the role normal microbiota plays in maintaining host health?

- A. They provide a surface that is incompatible for attachment of an invader.
- B. They establish competition for nutrients and vitamins.
- C. They produce antimicrobial substances.
- D. They stimulate the immune system.
- E.** All of the choices are true.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.02

Section: 16.02

Topic: Pathogenesis

Chapter 16 - Host-Microbe Interactions

12.

Which of the following members of the normal microbiota inhibit the growth of *Candida albicans*?

A.

E. coli

B.

Lactobacillus species

C.

Staphylococci species

D.

Propionibacterium species

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.03

Section: 16.02

Topic: Pathogenesis

13.

The composition of the normal microbiota may be affected by

- A. hormonal changes.
- B. use of antibiotics.
- C. obesity level.
- D. diet.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.03

Section: 16.02

Topic: Pathogenesis

14. The "hygiene hypothesis" proposes that

- A.** lack of exposure to microbes can promote development of allergies.
- B. cleanliness truly is next to godliness.
- C. hand washing is the best preventative measure against infection.
- D. the immune system develops best in a clean environment.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.03

Section: 16.02

Topic: Pathogenesis

15. The infectious dose

- A. is the same for all microorganisms.
- B. may be 10-100 cells for *Salmonella*.
- C. is expressed as ID50.
- D. is defined as the number of microbes necessary to ensure infection.
- E. is expressed as ID50 AND is defined as the number of microbes necessary to ensure infection.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

16. The number of organisms necessary to insure infection is termed the

- A. infectious dose.**
- B. fatal number.
- C. minimum lethal dose.
- D. pathogenic number.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

17. Growth of a parasitic organism in or on the host is referred to as

- A. colonization.
- B. infection.**
- C. pathogenism.
- D. mutualism.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

18. A disease-causing microorganism or virus is referred to as a(n)

- A. avirulent infection.
- B. colony.
- C. commensal.
- D.** pathogen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

19. Opportunists or opportunistic pathogens

- A. are usually saprophytes.
- B.** take advantage of special circumstances.
- C. are usually mutualistic.
- D. always cause disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

20. The suffix -emia means in the

- A. body.
- B. lymph.
- C. interstitial tissue.
- D.** blood.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

21. Attributes of an organism that promote pathogenicity are called

- A. disease factors.
- B. colonization factors.
- C. mutualistic.
- D. virulence factors.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

22.

Virulent pathogens are

- A. more likely to cause disease.
- B. more likely to cause severe disease.**
- C. unable to cause disease.
- D.

more likely to be opportunists.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

23. Which of the following may be considered virulence factor(s)?

A.

Edhesins

B.

Capsules

C.

Endotoxins

D.

Proteases

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

24. Which of the following does *S. pneumoniae* use to survive in the host?

A.

Plasmids

B.

Pili

C.

Flagella

D.

Capsules

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.10

Section: 16.04

Section: 16.07

Topic: Pathogenesis

25. Which of the following would be considered a sign of a disease?

A.

Headache

B.

Pain

C.

Nausea

D.

Fever of 39°C

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

26. People who carry and may spread pathogenic organisms without any overt symptoms of illness are called

A. primary infections.

B. secondary infections.

C. mutualists.

D. carriers.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

27. The spread of toxin via circulation is called

- A. septicemia.
- B. bacteremia.
- C. sepsis.
- D.** toxemia.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

28. If a disease affects only a human and not an animal, then it would be difficult to fulfill Koch's postulate number

- A. 1.
- B. 2.
- C.** 3.
- D. 4.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 16.06

Section: 16.04

Topic: Infection and Disease

29. A more modern equivalent to Koch's Postulates is termed

- A. Pasteur's Systematics.
- B. Hoch's Postulates.
- C. Atomic Theory.
- D. Protein Theory.
- E.** Molecular Postulates.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.06

Section: 16.04

Topic: Pathogenesis

30. Species of both *Shigella* and *Streptococcus*

- A. invade host cells.
- B. produce a toxin.
- C. cause ergot poisoning.
- D. are delivered via flea bites.
- E.** invade host cells AND produce a toxin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

31. Which of the following causes a foodborne intoxication?

- A. *Staphylococcus aureus*
- B. *E. coli* O157:H7
- C. *Clostridium botulinum*
- D. *Mycobacterium tuberculosis*
- E.**

Staphylococcus aureus, E. coli O157:H7, AND Clostridium botulinum

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.12

Section: 16.08

Topic: Pathogenesis

32. Adhesins are

- A. involved in the first step of the infectious process.
- B. often found at the tip of pili.
- C. found in flagella.
- D. endotoxins.
- E. involved in the first step of the infectious process AND often found at the tip of pili.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

33. The first step in the establishment of infection is that the organism must

- A. invade host tissues.
- B. attach to host cells.**
- C. evade phagocytes.
- D. produce toxins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

34. Which of the following factors is not considered important for the establishment of an infection?

A.

Adherence

B.

Dose

C.

Toxicity

D.

Virulence factors

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

35. Typically, adhesins

A. are found on pili.

B. help bacteria attach to host cells.

C. are proteins.

D. are found on host cells.

E.

are found on pili, help bacteria attach to host cells, AND are proteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

36. The lack of susceptibility to diseases of other species in humans may be due to the
- A. secretion of exotoxins.
 - B. presence of endotoxins.
 - C. action of IL-2.
 - D.** lack of receptors that are recognized by adherence factors.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

37. An example of genetic variation used in pathogen survival may be
- A. production of a comet's tail.
 - B. protease production.
 - C. inhibition of MHC Class I antigen production.
 - D.** changing the pilus type.
 - E. production of a comet's tail AND protease production.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.10

Section: 16.07

Topic: Pathogenesis

38. Colonization of the body is inhibited by
- A. the shedding of skin cells.
 - B. the movement of mucus by cilia.
 - C. peristalsis.
 - D. the flushing action of the urinary tract.
 - E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

39. The process by which infectious agents are ingested by host cells is termed

- A. exocytosis.
- B. pinocytosis.
- C. endocytosis.**
- D. phagosome fusion.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.10

Section: 16.07

Topic: Pathogenesis

40. Bacteria that resist killing by complement proteins are termed

- A. carriers.
- B. serum resistant.**
- C. balanced pathogens.
- D. mutualistic.
- E. carriers AND serum resistant.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.10

Section: 16.07

Topic: Pathogenesis

41. C5a peptidase

- A. is a virulence factor.**
- B. synthesizes C5a.
- C. is produced by the host cell in response to infection.
- D. is a molecule promoting chemotaxis.
- E. is a virulence factor AND is a molecule promoting chemotaxis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.10

Section: 16.07

Topic: Pathogenesis

42. Bacteria may survive phagocytosis by
- A. preventing fusion of the lysosome with the phagosome.
 - B. lysing the phagosome.
 - C. producing comet tails.
 - D. preventing fusion of two phagosomes.
 - E. preventing fusion of the lysosome with the phagosome AND lysing the phagosome.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.10

Section: 16.07

Topic: Pathogenesis

43. The chemical nature of endotoxins is that of a
- A. protein.
 - B. nucleic acid.
 - C. lipid.
 - D. lipopolysaccharide.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.11

Section: 16.08

Topic: Pathogenesis

44. The chemical nature of exotoxins is that of a
- A. protein.**
 - B. carbohydrate.
 - C. lipid.
 - D. lipopolysaccharide.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.11

Section: 16.08

Topic: Pathogenesis

45. Which is true about superantigens?

- A. They are a type of exotoxin.
- B. They bind to MHC class II antigen on T cells.
- C. They enhance specific antibody production.
- D. They are processed intracellularly.
- E. They are a type of exotoxin AND they bind to MHC class II antigen on T cells.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.12

Section: 16.08

Topic: Pathogenesis

46. Which of the following is/are true about endotoxins?

- A. Lipid A is the toxic portion of the molecule.**
- B. The toxic effects depend on the bacteria from which it came.
- C. The lipid A is immunogenic.
- D. They are proteins.
- E. The toxic effects depend on the bacteria from which it came AND they are proteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.11

Section: 16.08

Topic: Pathogenesis

47. Which is/are true of viruses?

- A. They may suppress the production of MHC Class I protein.
- B. They may produce an MHC Class I mimic protein.
- C. They may prevent cell suicide.
- D. They may bind to MHC class II antigens.

E.

They may suppress the production of MHC Class I protein, they may produce an MHC Class I mimic protein, AND they may prevent cell suicide.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.15

Section: 16.09

Topic: Immunity and Immunization

48. Disease(s) in which the causative agent becomes latent is/are

- A. cold sores.
- B. genital herpes.
- C. shingles.
- D.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

49. The damage caused by parasites may be due to

- A. competition for nutrients.
- B. the physical blocking of organs.
- C. the direct digestion of host tissue.
- D. the host's immune response.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.17

Section: 16.10

Topic: Pathogenesis

True / False Questions

50. The most successful parasites are the ones that live in harmony with their hosts.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.17

Section: 16.10

Topic: Pathogenesis

51. A human fetus has no resident microbial population.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.03

Section: 16.02

Topic: Pathogenesis

52. Infection always leads to disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

53.

An infectious disease is an infection that impairs the normal state of health.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 16.04

Section: 16.03

Topic: Infection and Disease

54. Obligate intracellular parasites may be grown in special synthetic media.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.14

Section: 16.09

Topic: Pathogenesis

55. During incubation and convalescence a person may still spread infectious organisms.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

56. The infectious dose of most pathogens is about equal.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.05

Section: 16.03

Topic: Pathogenesis

57. A strong attachment of a microorganism to a host cell automatically leads to disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

58. High concentrations of some bacteria are necessary for successful invasion because only at high density are their virulence genes expressed.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

59. Only Gram-positive bacteria produce exotoxins.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 16.11

Section: 16.08

Topic: Pathogenesis

Multiple Choice Questions

Chapter 16 - Host-Microbe Interactions

60.

The normal microbiota provides protection against potentially harmful organisms and stimulates the immune system. Why would the immune responses to members of the normal microbiota cross-react with pathogens?

A.

Because one person's normal microbiota is another person's pathogen-when we pick up "normal" microbes from a different person, they will always cause infection within us.

B.

Because pathogens are oftentimes more virulent strains of our own normal microbial microbiota, so they will "look" roughly the same to our immune system (and be acted upon by our immune responses).

C.

Because the normal microbiota keeps the adaptive immune responses tuned up, active, and ready to respond to broad, general categories of microbes (i.e., Gram-positive vs. Gram-negative microbes, viruses, etc.).

D.

Because the immune system is a "use it or lose it" system. If it isn't used on a regular basis, we completely lose the ability to respond to pathogens. The normal microbiota keeps the system going so that it can be ready to respond to such pathogens when we're exposed to them.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.02

Section: 16.02

Topic: Immunity and Immunization

61.

Which of the following is NOT a likely reason why diseases caused by opportunists are becoming more frequent in the U.S. population?

A. HIV individuals (with impaired immune systems) survive longer due to more effective therapies-but this allows them a longer period of time to be infected by opportunists.

B.

Individuals in the United States are living longer than ever before-but they're living with a number of chronic health issues that can impair the immune system. This leads to a greater likelihood of opportunistic infections.

C.

Cancer treatments have improved significantly in the last 30 years-but they often suppress the immune system. This leads to a greater likelihood of opportunistic infections in such individuals.

D.

Travel into and out of the United States has increased significantly. This has the potential to bring in many new pathogens that can cause new infections, even in otherwise healthy and immunocompetent individuals.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.04

Section: 16.03

Topic: Pathogenesis

62.

In two of Koch's postulates (#2 and #3), a pure culture of the organism is required. Which of the following would NOT be a possible consequence of using a contaminated culture?

A. You can't necessarily attribute the illness directly to the microbe in question-it may in fact be caused by the contaminating microbe.

B.

There's the possibility that the test animal might be acutely susceptible to the contaminating microbe, but completely resistant to the microbe you suspect causes the illness of interest. As such, when you introduce it into the test animal, it could confuse your final results.

C.

The problem is that one microbe may be toxic to the other. It may have killed all of your suspect microbe in the culture. Therefore, you can't be sure that you're infecting your test animals with the microbe you suspect is causing the illness, or if it's only the second (contaminating) microbe.

D.

Even though there's a contaminating microbe present, so long as the original suspect microbe is also present, the disease should still manifest in test animals. It should also still be recoverable from test animals following infection. As such, there's really no consequence to using a contaminated culture.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.06

Section: 16.04

Topic: Infection and Disease

63. Why is it a good strategy for a microbe to adhere to a receptor that plays a critical function for a host cell?

A. It ISN'T a good strategy-host cells could shift to a backup receptor and shut down production of the main receptor, preventing infection.

B.

If it's a receptor the cell MUST use, it doesn't have a backup system in place to switch to-so, even though it makes it susceptible to infection, it HAS to put that target out there. This benefits the microbe.

C.

Microbes need to evade detection and elimination by the immune system-if they adhere to a receptor that plays a critical function, they are less likely to trigger destructive immune responses. This would be similar to using a hostage as a shield in a police-standoff situation.

D. It ISN'T a good strategy-by binding to receptors, microbes will be phagocytosed by cells and destroyed within them.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.07

Section: 16.05

Topic: Pathogenesis

64.

Home-canned foods should be boiled before consumption to prevent botulism. Considering that this treatment does NOT destroy endospores, why would it be helpful in preventing the disease?

A. Because it would destroy the vegetative cells, and only the vegetative cells cause the disease.

B. Because it would at least weaken the endospores, making them more susceptible to elimination by our immune system.

C.

Because the heat would denature the botulism exotoxin and inactivate it. The exotoxin is what leads to the disease symptoms, so this would make the food safer.

D.

Because the heat would denature the botulism endotoxin and inactivate it. The endotoxin is what leads to the disease symptoms, so this would make the food safer.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.12

Section: 16.08

Topic: Pathogenesis

65.

A number of viruses often include a similar set of symptoms when they cause an infectious disease state (fever, headache, fatigue, runny nose). Why would they all cause the same symptoms if they're different viruses?

A. They all possess the same basic virulence genes and molecules, so they all trigger the same responses.

B.

The symptoms are associated with the immune system's response, NOT the molecules from the pathogens themselves. Our responses against viruses are fairly similar, regardless of virus type, so the symptoms are similar.

C.

Most viruses infect the upper respiratory tract-this leads to the common set of symptoms listed above. Only a few viruses infect areas away from this region.

D.

Viruses specifically infect mainly epithelial membranes. As such, the virally induced reaction is similar in different areas of the body due to the same basic cell types (epithelial cells) being infected in each area.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 16.13

Section: 16.08

Topic: Pathogenesis

Chapter 17 Immunologic Disorders

Multiple Choice Questions

1. The initial work on anaphylaxis was done by
- A. Watson and Crick.
 - B. Pasteur.
 - C. Fleming.
 - D.** Richet and Portier.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: History of Microbiology

2. If the immune system responds inadequately to antigenic stimulation, this is termed
- A. hypersensitivity.
 - B. autoimmunity.
 - C. cell-mediated immunity.
 - D.** immunodeficiency.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

3. The immunoglobulin associated with Type I hypersensitivity is

- A. IgG.
- B. IgA.
- C. IgM.
- D. IgE.**
- E. IgD.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

4. IgE molecules involved in hypersensitivity reactions have become attached to

- A. neutrophils.
- B. mast cells.**
- C. B cells.
- D. macrophages.
- E. mast cells AND B cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

5. To produce an allergic reaction in Type I hypersensitivity, the antigen

- A. must bind to mast cells.
- B. must bind to free IgE molecules.
- C.

must just bind to IgE on mast cells.

D.

must bind to two neighboring IgE molecules on mast cells crosslinking them.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

6. During a Type I hypersensitivity reaction, the mast cells

- A. become phagocytic.
- B. release IgE antibodies.
- C. degranulate.
- D. immediately release histamine.
- E.** degranulate AND immediately release histamine.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

7. Urticaria is characterized by

- A. living in Utica.
- B. wheal and flare.**
- C. asthma.
- D. inflammation.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

8. Generalized anaphylaxis is generally characterized by

- A. wheal and flare.
- B. inflammation.
- C. shock.**
- D. rash.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

9. Most cases of generalized anaphylaxis are a result of

- A. fire ant stings.
- B. aspirin.
- C. bananas.
- D.**

peanuts, bee stings, or penicillin injections.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

10. Desensitization

- A. stimulates an increase in IgG.
- B. reduces the number of mast cells.
- C. increases the number of basophil cells.
- D. is a treatment for hypersensitivity reactions.
- E. stimulates an increase in IgG AND is a treatment for hypersensitivity reactions.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

11.

The hypersensitivity treatment that stimulates an increase of IgG and regulatory T cells as well as a decrease in IgE is known as

- A. desensitization.**
- B. immunity.
- C. sensitization.
- D. exposure.
- E. anaphylaxis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

12. Recombinant human monoclonal antibody (rhuMAb)

- A. appears promising as a treatment for asthma.
- B. decreases the levels of IgG.
- C. uses an engineered form of an IgG molecule.
- D. promotes crosslinking between IgE molecules on the mast cells.
- E.** appears promising as a treatment for asthma AND uses an engineered form of an IgG molecule.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

13. The type of hypersensitivity expressed with the lysing of red blood cells is

A.

type I.

B.

type II.

C.

type III.

D.

type IV.

E.

type V.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

14. A transfusion reaction primarily involves

A. leukocytes.

B. phagocytes.

C. platelets.

D. erythrocytes.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

15. The natural antibodies in serum that react with A or B polysaccharide antigens are mostly of the class

- A. IgG.
- B. IgE.
- C. IgM.**
- D. IgD.
- E. IgA.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

16. Anti-A and anti-B antibodies

- A. are considered natural antibodies.
- B. are present at birth.
- C. are typically IgM.
- D. easily cross the placenta.
- E. are considered natural antibodies AND are typically IgM.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

17. Regarding a mismatch of either the Rh antigen or the AB antigen, both

A.

result in destruction of red blood cells by the foreign antigen.

B.

utilize complement to destroy red blood cells.

C.

utilize antibody-dependent cellular cytotoxicity to destroy the red blood cells.

D. result in destruction of only leukocytes.

E.

utilize either complement or antibody-dependent cellular cytotoxicity to destroy red blood cells.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Section: 17.02

Topic: Disorders in Immunity

18. Antibodies that have arisen in the blood plasma without any obvious or deliberate stimulus are called

A. natural.

B. acquired.

C. injurious.

D. active.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

Chapter 17 - Immunologic Disorders

19. Hemolytic disease of the newborn

- A. may not manifest itself fully until after birth.
- B. is due to the action of IgM.
- C. is due to the action of IgE.
- D.

is a type I hypersensitivity reaction.

- E. may not manifest itself fully until after birth AND is due to the action of IgE.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

20.

The cell type responsible for type II hypersensitivity is the

- A. mast cell.
- B. B cell.
- C. macrophage.
- D. platelet.
- E. neutrophils.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

21. Immune complexes

- A. consist of antigen-antibody bound together.
- B. are usually cleared rapidly from the body.
- C. bind to Fc receptors on cells.
- D.

are involved in type III hypersensitivity reactions.

E. All of the choices are correct.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

22. Localized injury or death of tissue resulting from repeated injections of an antigen into a person with high levels of circulating specific antibody is known as

- A. farmer's lung.
- B. German measles.
- C. serum sickness.
- D.** an Arthus reaction.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

23. Arthus reactions and serum sickness are examples of _____ hypersensitivity.

- A. type I
- B. type II
- C. type III**
- D. type IV
- E. type V

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

24. Which of the following disease states is not among those caused by immune complexes?

A.

Systemic lupus erythematosus

B.

Serum sickness

C.

Hay fever

D.

Glomerulonephritis

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

25. Delayed hypersensitivity is also known as _____ hypersensitivity.

- A. type I
- B. type II
- C. type III
- D. type IV**
- E. type V

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

26. Delayed type hypersensitivity primarily involves

- A. erythrocytes.
- B. B cells.
- C. T cells.**
- D. mast cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

27. Type IV hypersensitivity reactions typically peak within

- A. minutes.
- B. hours.
- C. 12 hours.
- D. 2-3 days.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

28. Which of the following is associated with contact dermatitis?

A.

poison ivy.

B.

latex.

C.

tuberculin skin test.

D.

hay fever.

E.

poison ivy, latex, AND tuberculin skin test.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

29. The redness and induration found after a tuberculin skin test involve the action of

A. sensitized T cells.

B. IgE.

C. complement.

D. basophil cells.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

30. Patch tests are used to detect

- A. hives.
- B. serum sickness.
- C. immune complexes.
- D.** contact hypersensitivity.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

31. Which of the following have been an effective immunosuppressant for use in transplantation?

A.

Amphotericin B and cephalosporin

B.

Amphotericin B and cyclosporin A

C.

Amphotericin B and tacrolimus

D.

Cephalosporin and tacrolimus

E.

Cyclosporin A and tacrolimus

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

32. Graft-versus-host disease is primarily a

A.

type I reaction.

B.

type II reaction.

C.

type III reaction.

D.

type IV reaction.

E.

type V reaction.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

33. The tissue antigens most involved in graft rejection involve

A. Rh.

B. ABO.

C. MHC.

D. MLB.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

34. Killing of graft cells occurs through a complex series of mechanisms including

- A. sensitized T cytotoxic cells.
- B. NK cells.
- C. erythrocytic cells.
- D. basophilic cells.
- E. sensitized T cytotoxic cells AND NK cells.**

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

35. Cyclosporin A

- A. is a relatively general immunosuppressive agent.
- B. suppresses T cell proliferation.**
- C. activates macrophages.
- D. stimulates antibody production.
- E. is a relatively general immunosuppressive agent AND suppresses T cell proliferation.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

36. Immunosuppressive drugs

- A. are only needed during the first week after transplantation.
- B. are only needed for the first year after transplantation.
- C. are needed indefinitely after transplantation.**
- D. are needed for transplants between identical twins.
- E. are needed indefinitely after transplantation AND are needed for transplants between identical twins.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

37. Allografts

- A. are normally rejected within hours.
- B. are grafts between non-identical members of the same species.
- C. would include the fetus.
- D.**

are grafts between non-identical members of the same species AND would include the fetus.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

38. The fetus is not rejected because

A. it is too small.

B. it is in an immunologically privileged site.

C. the father is immunosuppressed.

D. it has no antigens.

E. it is in an immunologically privileged site AND the father is immunosuppressed.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

39. Which of the following primary immunodeficiencies is the most common?

A.

Severe combined immunodeficiency

B.

Selective IgA deficiency

C.

Agammaglobulinemia

D.

Di George's syndrome

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

Chapter 17 - Immunologic Disorders

40.

If the thymus fails to develop,

- A. functional T cells are absent.
- B. functional B cells are absent.
- C. Di George's syndrome exists.
- D. complement deficiencies exist.
- E.** functional T cells are absent AND Di George's syndrome exists.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

41. If a patient lacks B cells, the resulting disease is

- A. SCID.
- B. AIDS.
- C. Di George's syndrome.
- D.** agammaglobulinemia.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

42. Defects in bone marrow stem cells result in a condition known as

- A. SCID.
- B. AIDS.
- C. Di George's syndrome.
- D. Chediak-Higashi disease.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

43. A defect in which of the following systems leads to granulomatous disease?

- A. lymphatic system
- B. circulatory system
- C. oxidase system
- D. Golgi system

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

44.

A secondary immunodeficiency disease is not the result of

- A. genetic defects.
- B. malignancies.
- C. advanced age.
- D. malnutrition.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.05

Section: 17.03

Topic: Disorders in Immunity

45. HIV

- A. appears to cause AIDS.
- B. is an RNA virus.
- C. destroys T helper cells.
- D. makes the patient vulnerable to infections, especially those caused by opportunists.
- E. All of the choices are correct.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.06

Section: 17.03

Topic: Disorders in Immunity

46. If the body recognizes parts of itself as being foreign, this is termed

- A. immunodeficiency disease.
- B. agammaglobulinemia.
- C. autoimmune disease.
- D. AIDS.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.03

Section: 17.02

Topic: Disorders in Immunity

47. Myasthenia gravis is an example of an autoimmune disease that involves

- A. sensitized T cells.
- B. cytotoxic T cells.
- C. antibodies.
- D. IgD.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.04

Section: 17.02

Topic: Disorders in Immunity

48. Insulin-dependent diabetes mellitus is an example of an autoimmune disease that involves

- A. sensitized T cells.
- B. cytotoxic T cells.**
- C. antibodies.
- D. IgD.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.04

Section: 17.02

Topic: Disorders in Immunity

49. Gene therapy technology

- A. may be used to generate cells for transplantation.
- B. may overcome graft rejection.
- C. may treat cancer.
- D. may down-regulate the immune response.
- E. may overcome graft rejections AND may treat cancer.**

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 3. Apply

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

50. Stem cells

- A. have an almost unlimited capacity to divide.
- B. can differentiate into different tissues.
- C. may be used to test the effects of drugs on human cells.
- D. come from fetal material.
- E. All of the above**

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.04

Section: 17.02

Topic: Disorders in Immunity

True / False Questions

51. First exposure to an allergen results in a violent hypersensitivity reaction.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

52. Anaphylaxis is the name given to allergic reactions caused by IgE-mediated release of mast cell granules.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

53. Generalized anaphylaxis may be quickly controlled with the use of antihistamines.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

54. Allergic rhinitis and hives may both respond to antihistamines.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 17.01

Section: 17.01

Topic: Disorders in Immunity

55. Type O blood is missing both anti-A and anti-B antibodies.

TRUE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

56. Anti-A and anti-B antibodies are natural antibodies and are present at birth.

FALSE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Section: 17.02

Topic: Disorders in Immunity

57. Mismatch of either the Rh antigen or the AB antigen results in lysis of red blood cells by complement.

TRUE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

58. Anti-Rh antibodies may not cross the placenta.

FALSE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Section: 17.02

Topic: Disorders in Immunity

59. MHC plays a pivotal role in transplant rejection.

TRUE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

60. A lack of T cells makes one more vulnerable to intracellular parasites.

TRUE

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 17.06

Section: 17.03

Topic: Disorders in Immunity

Multiple Choice Questions

61. Why do Rh-negative but not Rh-positive mothers sometimes have babies with hemolytic disease of the newborn?

A.

This disease results when an Rh-negative mother's immune system is primed multiple times to produce anti-Rh IgG antibodies that can cross the placenta. If the mother is Rh-positive, she won't produce any anti-Rh antibodies at all.

B.

Rh-positive mothers produce IgM antibody, not IgG. This antibody can't cross the placenta, so it can't cause hemolytic disease of the newborn.

C.

Rh-positive mothers will receive a preventative shot from their physician prior to conception. This will provide the protection the fetus needs AFTER conception to avoid the disease.

D.

Rh-negativity is also associated with hyperproduction of antibodies. As such, Rh-negative mothers are more likely than Rh-positive mothers to produce the antibodies needed to produce this disease.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 5. Evaluate

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

62. What is NOT a reason that the kidneys are particularly prone to damage caused by immune complexes?

A.

Kidney blood vessel wall cells have receptors for antibodies on them, which makes them soak up antibodies (or in this case, immune complexes) from the bloodstream. This blocks the kidneys up and causes them to malfunction and become damaged.

B. Blood is pushed through the kidneys at a very high pressure-any blockage of the vessels (such as what might be caused by immune complex deposits) can lead to ruptures/inflammation and damage.

C.

While blood vessel walls do NOT have receptors for antibodies, large immune complexes forced through small diameter vessels can become embedded within them. This can trigger complement system inflammation and cell destruction.

D.

Trapped immune complexes that initiate inflammation can attract neutrophils. The neutrophils degranulate in the area of the immune complexes, leading to cell/tissue destruction.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 5. Evaluate

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

Chapter 17 - Immunologic Disorders

63.

In the tuberculin skin test, what would be the most likely reason why a positive test would NOT necessarily indicate an infection in progress in a patient who was born and grew up in the United States?

A.

False-positives occur all the time. This might simply be an example of that.

B.

The TB skin test is a measure of reactivation of memory T cells. The memory T cells would be formed either during an active infection or would be remnants of a prior infection that may be cleared. Since the memory of the response persists, the test still shows positive, even though the patient is cleared of actual infection.

C.

Each person in the United States receives the BCG tuberculosis vaccine. This is an attenuated mycobacterium vaccine. The response to this vaccine makes us positive for the TB skin test, even though we may not have actually had a TB infection at any point in our lives.

D.

A positive TB skin test ALWAYS indicates a current, active infection.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

64. If a patient received a kidney transplant that was matched well across each of the major histocompatibility complex (MHC) molecules, but they stopped taking their anti-rejection drugs, what would happen and why?

A.

Nothing-the transplant is matched, so the patient doesn't need the drugs to prevent rejection. The new organ should be seen by the recipient's immune system as "self."

B.

The organ will be rejected very quickly, as allografts (tissue from the same species, but a different individual) are seen by the recipient's immune system as "foreign," and are quickly attacked.

C.

The organ will be rejected, but it will be a gradual process since it was matched well. There are a number of other proteins that cannot be matched between donors, so the graft will still be viewed as "foreign" by the recipient's immune system, and will still be attacked. The attack will just be a slower and lengthier process.

D.

Nothing-since the transplant was accepted for so long with the anti-rejection drugs, the person's immune system has had the time to become accustomed to it and now views the graft as "self." It will not be attacked.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 5. Evaluate

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

Chapter 17 - Immunologic Disorders

65.

What might be an advantage to using an individual's own stem cells instead of pancreatic cell allografts to treat type I diabetes?

- A. Stem cells can disable the immune responses that led to the diabetes state in the first place.
- B. This process should be far cheaper than the surgical intervention needed for the allograft.
- C.

You can't do this-stem cell research it is still theoretical, not approved by the FDA, and is currently illegal in the United States. As such, there is no advantage.

D.

If you were able to use a person's own cells, it would be considered an autograft rather than an allograft. As such, there should be no HLA/MHC matching required, and no long-term anti-rejection drugs needed.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 5. Evaluate

Learning Outcome: 17.02

Section: 17.01

Topic: Disorders in Immunity

66.

Multiple myeloma is a plasma cell tumor in which a clone of malignant plasma cells produces large amounts of immunoglobulin. With all this excess immunoglobulin, how can a person with multiple myeloma be immunodeficient?

A.

All the immunoglobulin produced is most likely specific to one antigen. This limits the ability to respond to the diversity of antigens we encounter.

B. The multiplication of the malignant plasma cells may crowd out normal production of other immune cells required for protective responses.

C. The massive overproduction of immunoglobulin impairs the kidneys, preventing production of the correct hormones from the kidneys to balance immune system cell production from the bone marrow.

D.

Through a negative feedback loop, the large amount of immunoglobulin tricks the immune system into thinking it's making a strong response that is needed. As such, it shuts down production of other responses that might truly BE needed to fight off a pathogen.

E.

All the immunoglobulin produced is most likely specific to one antigen. This limits the ability to respond to the diversity of antigens we encounter AND the multiplication of the malignant plasma cells may crowd out normal production of other immune cells required for protective responses.

ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods, and apply these methods to analogous situations.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 5. Evaluate

Learning Outcome: 17.06

Section: 17.03

Topic: Disorders in Immunity

Chapter 18 Applications of Immune Responses

Multiple Choice Questions

1. The practice of deliberately stimulating the immune system is called
- A. acquired immunity.
 - B. memory immunity.
 - C. vaccination.**
 - D. hypersensitivity.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

2. The procedure developed by the Chinese to protect against smallpox was called
- A. Oriental poxination.
 - B. humoral immunity.
 - C. variolation.**
 - D. naturally acquired immunity.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

3. Variolation is a procedure once used to protect against

- A. measles.
- B. bubonic plague.
- C. rabies.
- D.** smallpox.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

4. The scientist who made variolation safer and more effective was

- A. Pasteur.
- B.** Jenner.
- C. Metchnikoff.
- D. Fleming.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

5. The term vaccination

- A. is a general term that would include the process of variolation.
- B. was coined by Jenner.
- C. was coined by Pasteur.
- D. comes from the Latin for cow, *vacca*.
- E.** is a general term that would include the process of variolation, was coined by Pasteur AND comes from the Latin for cow, *vacca*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

6. The virus originally used for vaccination against smallpox is named

- A. vaccinia.
- B. cowpox.**
- C. rubella.
- D. herpes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

7. The last case of naturally contracted smallpox occurred in

- A. 1900.
- B. 1950.
- C. 1965.
- D. 1977.**
- E. 1989.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: History of Microbiology

8. Almost all of the antibodies found in a newborn are

- A. the result of infection.
- B. self-made.
- C. IgM.
- D. the result of passive immunity.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

9. Which antibodies cross the placenta and protect the fetus?

- A. IgA
- B. IgG**
- C. IgM
- D. IgD

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

10. Herd immunity

- A. only occurs in a population in which all individuals are immune.
- B. occurs in a population in which a large percentage of the population is immune.**
- C. only provides protection to those that are already immune.
- D. is responsible for dramatic increases in childhood diseases.
- E. occurs in a population in which a large percentage of the population is immune AND is responsible for dramatic increases in childhood diseases.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

11. Attenuated agents are

- A. dead viruses.
- B. toxins.
- C. weakened but replicating microbes.**
- D. parts of an organism.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

12. Attenuated agents

- A. may induce immunity after a single dose.
- B. may cause disease in immunocompromised individuals.
- C. multiply in the body.
- D. may revert or mutate to disease-causing strains.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

13. Inactivated immunizing agents are prepared by treatment with

- A. alcohol.
- B. phenol.
- C.** formalin.
- D. histamine.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

14. The Salk vaccine

- A. contains live attenuated virus.
- B.** contains inactivated virus.
- C. contains a portion of the polio virus.
- D. occasionally causes disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.04

Section: 18.02

Topic: Immunity and Immunization

15. The Salk vaccine

- A. protects against nervous system and gastrointestinal infection.
- B. protects only against gastrointestinal infection.
- C. is a subunit vaccine.
- D.** protects only against nervous system infection.
- E. protects against nervous system and gastrointestinal infection AND is a subunit vaccine.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.04

Section: 18.02

Topic: Immunity and Immunization

16. Whole agent vaccines may contain

- A. viruses.
- B. bacteria.
- C. toxins.
- D. polysaccharides.
- E.** viruses AND bacteria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

17. Toxoids are used in vaccines against

- A. Haemophilus influenza type b.
- B.** diphtheria.
- C. herpes simplex type I.
- D. polio.
- E. diphtheria AND herpes simplex type I.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

18. Substances that are contained in vaccines to help induce a better immune response are called

- A. primary substances.
- B. secondary substances.
- C. adjuvants.
- D. adjuncts.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

19. A recombinant vaccine is used to protect against

- A. polio.
- B. diphtheria.
- C. hepatitis B.
- D. pertussis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

20. The most common adjuvant is

- A. ethanol.
- B. formalin.
- C. alum.
- D. aluminum.
- E. alum AND aluminum.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

21. For which of the following childhood diseases is a subunit vaccine recommended?

A.

Polio

B.

Measles

C.

Hepatitis B

D.

Pertussis

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.05

Section: 18.02

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

22. Which type of vaccine has been used in place of inactivated whole cell vaccine?

A.

Acellular subunit

B.

Whole cell attenuated

C.

Adjuvant

D.

Toxin

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

23. The vaccine that is stable to heat, has little unwanted material and causes minimal side effects is called a(n)

A. inactive vaccine.

B. active vaccine.

C. toxoid.

D. peptide.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.06

Section: 18.02

Topic: Immunity and Immunization

24. A poorly understood, yet promising type of vaccine that causes the host to produce microbial antigens for a short time involves the use of

- A. subunits.
- B. DNA.**
- C. alum.
- D. toxoids.
- E. glycoproteins.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.06

Section: 18.02

Topic: Immunity and Immunization

25. DNA vaccines work by

- A. stimulating production of antibodies against DNA.
- B. stimulating interferon production.
- C. inactivating the host DNA.
- D. having the cell use the introduced DNA to make the microbial protein antigen.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.06

Section: 18.02

Topic: Immunity and Immunization

26. Monoclonal antibodies obtained from a hybridoma provide

A.

a large amount of an antibody that is specific for a particular epitope.

B.

a single antibody that recognizes many epitopes.

C.

many epitopes that recognize a specific antibody.

D. a large number of B cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.09

Section: 18.03

Topic: Immunity and Immunization

27. Injection of a single antigen usually results in production of

A. antibody to a single epitope.

B. an antibody that recognizes several epitopes.

C. additional antigen.

D. a number of antibodies each recognizing a different epitope.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.09

Section: 18.03

Topic: Immunity and Immunization

28. Monoclonal antibodies

- A. are usually of different classes.
- B. usually recognize several epitopes.
- C. have the same variable regions.
- D. are always IgE.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.09

Section: 18.03

Topic: Immunity and Immunization

29. The change from negative serum, without antibodies specific to an infecting agent, to positive serum, containing antibodies against that infecting agent, is called

- A. ELISA.
- B. complement fixation.
- C. seroconversion.
- D.

serum reversion.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.07

Section: 18.03

Topic: Immunity and Immunization

30. Immunological tests may determine the presence of

- A. only antibody.
- B. only antigen.
- C. antigen or antibody.
- D. neither antibody nor antigen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.07

Section: 18.03

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

31. If a positive reaction is last observed at a dilution of 1:256, the titer is

- A. 128.
- B. 1/512.
- C. 1/256.
- D.** 256.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.08

Section: 18.03

Topic: Immunity and Immunization

32. Serological tests are most often conducted in

- A. test tubes.
- B. flasks.
- C.** microtiter plates.
- D. graduated cylinders.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.08

Section: 18.03

Topic: Immunity and Immunization

33. An immune complex is defined as

- A. antigen combined with antigen.
- B.** antigen combined with antibody.
- C. antibody combined with antibody.
- D. complement combined with LPS.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

34. Precipitation reactions depend on
- A. the antigen having one epitope.
 - B. the antibody having one epitope.
 - C. the antigen having two or more epitopes.
 - D. the antigen having no epitopes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

35. Precipitation reactions carried out in agarose are called
- A. hemagglutination tests.
 - B. complement fixation tests.
 - C. immunodiffusion tests.
 - D.

ELISA tests.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

36. Precipitation occurs when
- A. antigen combines with antigen.
 - B. antibody combines with antibody.
 - C. antibody combines with antigen.
 - D. antibody combines with antigen at optimal proportions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.06

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

37. Immunodiffusion tests

- A. allow detection of specific antigens.
- B. are a simple method that produces visible results in the zone of optimal proportion.
- C. allow quantitation of antigen concentrations.
- D.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

38. Agglutination tests can be used to diagnose diseases caused by

- A. bacteria.
- B. hormones.
- C. fungi.
- D. viruses.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

39. The serology test that may show the antigen-antibody complex as yellow-green under the microscope while using an ultraviolet light is known as the

A.

Western blot.

B. fluorescent antibody test.

C. ELISA test.

D.

agglutination test.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.11

Section: 18.04

Topic: Immunity and Immunization

40. Anti-human-gamma-globulin antiserum is often used in

A. direct fluorescent antibody tests.

B. complement fixation test.

C. radioimmunoassay.

D. indirect fluorescent antibody tests.

E.

indirect ELISA, Western blot, AND indirect fluorescent antibody tests.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.10

Section: 18.04

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

41. Blood for transfusion is frequently tested for HIV by using the

A. complement fixation test.

B.

agglutination test.

C. ELISA method.

D.

Ouchterlony test.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.11

Section: 18.04

Topic: Immunity and Immunization

42. Anti-human-gamma-globulin antiserum is often used in

A. direct fluorescent antibody tests.

B. indirect ELISA.

C. Western blot.

D. indirect fluorescent antibody tests.

E. indirect ELISA, Western blot AND indirect fluorescent antibody tests.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 18.11

Section: 18.04

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

43.

Which of the following methods allows monitoring of the progressive destruction of CD4 T cells during an HIV infection by tagging the cells with specific antibodies to CD4 surface proteins and measuring their concentrations in serum?

A.

Western blot

B.

ELISA

C.

FACS

D.

Latex beads agglutination

E.

FA test on a microscope slide

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.12

Section: 18.04

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

44.

Which of the following tests allows the separation of cells according to their sizes, densities, and surface markers tagged by specific fluorescent antibodies?

A.

Western blot

B.

ELISA

C.

Fluorescence-activated cell sorter

D.

FA test on a microscope slide

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.12

Section: 18.04

Topic: Immunity and Immunization

True / False Questions

45. Active immunity develops only after a natural infection and not after vaccination.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

46. Attenuated agents often give rise to a long-lasting immunity.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

47. Inactivated vaccines typically require booster shots.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

48. Recombinant vaccines and inactivated vaccines typically require several shots to be effective.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

49. Alum is an adjuvant.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

50.

An adjuvant has been developed from lipid A.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

51. The effectiveness of DNA vaccines stems from the effective production of antibodies against the naked DNA molecule.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

52. DNA vaccines are dangerous due to the possibility of the DNA causing reversion in the inactivated pathogen.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

53. The risk of serious illness from measles is 500 times greater than from vaccination against the disease.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 18.05

Section: 18.02

Topic: Immunity and Immunization

54. Agglutination reactions utilize particles rather than molecules.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.13

Section: 18.04

Topic: Immunity and Immunization

55. A monoclonal antibody is typically IgE and recognizes several epitopes.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 18.09

Section: 18.03

Topic: Immunity and Immunization

Multiple Choice Questions

56. What would be a primary advantage of passive immunity with diseases such as tetanus or botulism?

A.

Time. You can quickly neutralize the toxin with a passive administration of antibodies to save the patient's life when none is available for them to make their own active immune response.

B.

Cost. It's far cheaper to administer a dose of antibodies harvested from the serum of an actively immunized animal or human than it is to administer a vaccine.

C.

Safety of delivery. It's far safer to administer a dose of antibodies harvested from the serum of an actively immunized animal or human than it is to administer a vaccine.

D.

Handling of treatment. It's difficult to keep vaccines stored properly to keep their potency, especially in Third World countries without adequate "cold chains" for transport into jungles and deserts. It's much easier to keep a batch of antibodies stable, even in extremes of heat and humidity.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 18.01

Section: 18.01

Topic: Immunity and Immunization

57. What would be a primary advantage of using an attenuated agent rather than just an antigen from that agent for a vaccine?

A. This is actually a disadvantage-it's much more dangerous to use an attenuated agent over a subunit (single antigen) vaccine due to the possibility of reversion of the microbe to a pathogenic state.

B.

An attenuated agent strongly stimulates ONLY the antibody production (humoral response) of the adaptive immune system. This provides the best and strongest long-term protection.

C.

An attenuated agent strongly stimulates ONLY the cytotoxic T cell (CTL, cell-mediated) side of the adaptive immune system. This provides the best and strongest long-term protection.

D. An attenuated agent strongly stimulates both the humoral (antibody) AND cell-mediated (T cell) portions of the adaptive immune response, giving the best comprehensive long-term protection available.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 18.03

Section: 18.02

Topic: Immunity and Immunization

Chapter 18 - Applications of Immune Responses

58.

Since many childhood diseases such as mumps and measles are rare now within the United States, why is it still important for children to be immunized against them?

A. If we lose herd immunity by removing mandatory vaccination, our population will become susceptible to these illnesses again in a short period of time.

B.

There is always the likelihood that an individual from another country could import one of these illnesses into the United States, sparking an outbreak of new infections, if we aren't all properly vaccinated.

C.

By keeping the population vaccinated, we keep incidence rates of these illnesses very low. This helps to protect people that cannot be vaccinated (very young children, pregnant women, immunocompromised individuals, the elderly).

D.

Many of these diseases are HIGHLY contagious, and commonly through respiratory droplet (airborne) transmission. This makes an outbreak within a susceptible population very possible. Keeping the population resistant through mandatory vaccination prevents this possibility.

E. All of the options are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 18.02

Section: 18.02

Topic: Immunity and Immunization

59. Would antibodies produced by a patient in response to infection be monoclonal, or polyclonal?

A. Since the infection is from only a single agent/microbe, the antibodies would be monoclonal.

B. Since a single pathogen has multiple antigens, and each antigen has multiple epitopes, the responding antibodies to a whole pathogen would be polyclonal.

C. Since the pathogen would most likely mutate slightly during the infection (producing different epitopes), the responding antibodies would be polyclonal.

D. Since the pathogen would acquire and modify self-antigens during the infectious process, the antibodies produced during the response would be polyclonal.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 18.09

Section: 18.03

Topic: Immunity and Immunization

60. Why is a false positive more significant in HIV testing of patients than in screening donated blood for transfusions?

A.

It isn't-both are equally dangerous/significant. False-positives in PEOPLE can lead to psychological trauma, but false-positives in BLOOD could lead to the useful blood being disposed.

B.

A false-positive in a PERSON is easily retestable. This makes it more significant, because we would simply quickly retest the person to verify their actual HIV status.

C.

A false-positive in BLOOD is easily retestable. This makes it less significant, because we would simply quickly retest the blood to verify its actual HIV status.

D.

This statement is backwards-false-positives in blood testing are more significant. If the false-positive rate is high and we don't realize it, we're more likely to dispose useful blood. This could lead to acute shortages of blood for patients who need transfusions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 18.11

Section: 18.04

Topic: Infection and Disease

Chapter 19 Epidemiology

Multiple Choice Questions

1.

Women died after childbirth of

- A. *S. aureus* intoxication.
- B. toxic shock syndrome.
- C. Klein's disease.
- D. puerperal fever.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

2. The doctor responsible for introducing the idea of hand washing before attending patients was

- A. Klein.
- B. Semmelweis.**
- C. Koch.
- D. Pasteur.

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: History of Microbiology

3. Diseases that can be transmitted from one person to another are termed

- A. symptomatic.
- B. clinical.
- C. acute.
- D. latent.
- E.** communicable.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

4. The natural habitat of a pathogen is referred to as its

- A. home.
- B. primary inhabitance.
- C. infectious site.
- D.** reservoir.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 19.02

Section: 19.01

Topic: Epidemiology

5. The number of cases of a specific disease per one hundred people exposed is called the

- A.** attack rate.
- B. index rate.
- C. mortality rate.
- D. obesity rate.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

6. The fraction of a population who die from a specific disease is called

- A. mortality rate.
- B. morbidity rate.
- C. attack rate.
- D. incidence rate.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

7. Diseases constantly present in a population are called

- A. epidemic.
- B. chronic.
- C. latent.
- D. endemic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

8. An epidemic that spreads worldwide is called a(n)

- A. epidemical.
- B. endemic.
- C. pandemic.
- D. syndemic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

Chapter 19 - Epidemiology

9. A cluster of cases in a specific population occurring in a brief period of time is called a(n)

- A. endemic.
- B. pandemic.
- C. outbreak.**
- D. attack break.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

10. Apparently healthy people who may transmit a pathogen they harbor are called

- A. vectors.
- B. fomites.
- C. vehicles.
- D. carriers.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

11. Gonorrhea is a disease that may be

- A. zoonotic.
- B. pandemic.
- C. syndemic.
- D. asymptomatic.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

12. A dramatic increase in the incidence of a specific disease in a given population is referred to as a(n)

- A. pandemic.
- B. endemic.
- C. epidemic.**
- D. mortality.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.01

Section: 19.01

Topic: Epidemiology

13. Diseases that primarily exist in animals, but may be transmitted to humans are called

- A. parasitic.
- B. symbiotic.
- C. zoonotic.**
- D. epidemic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

14. The reservoir of infection for botulism and tetanus is

- A. humans.
- B. soil.**
- C. water.
- D. animals.
- E. soil AND water.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

Chapter 19 - Epidemiology

15.

Which of the following is considered a zoonotic disease?

A.

Measles

B.

Typhoid

C.

Common cold

D.

Plague

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.01

Topic: Epidemiology

16. Vertical transmission involves

A. droplet transmission.

B. fomites.

C. pasteurization.

D. pregnant woman to fetus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

Chapter 19 - Epidemiology

17. The single most important measure to prevent the spread of disease is

- A. home cooking.
- B. canning.
- C. pasteurization.
- D.** hand washing.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

18. Inanimate objects capable of transferring infectious disease agents are

- A. vectors.
- B.** fomites.
- C. vehicles.
- D. reservoirs.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

19. Large respiratory droplets typically travel no farther from point of release than

- A. 3 meters.
- B. 5 meters.
- C.** 1 meter.
- D. 20 meters.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

20. Important sources of contamination in crowded locations are

- A. blood.
- B. droplets of saliva or mucus.**
- C. restrooms.
- D. kitchens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

21. Droplet nuclei typically travel no farther from point of release than

- A. 3 meters.
- B. 5 meters.
- C. 1 meter.
- D. They are suspended indefinitely.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

22. In order to prevent spread of microorganisms from the microbiology laboratory, the room air should be

- A. under positive pressure.
- B. under negative pressure.
- C. filtered.
- D. chilled.
- E. under negative pressure AND filtered.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

23. Which of the following is not a vector?

A.

Fomite

B.

Human

C.

Fly

D.

Flea

E.

Fomite AND human

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

24. Which of the following is not a mechanical vector?

A.

Fomite

B.

Human

C.

Fly

D.

Flea

E.

Fomite AND human

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

Chapter 19 - Epidemiology

25.

The amount of infecting agent received by susceptible individuals is called the infectious

- A. exposure.
- B. number.
- C. dose.
- D. level.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

26. The period of time between exposure to an agent and the onset of disease signs and symptoms is called the

- A. prodromal phase.
- B. decline phase.
- C. incubation period.
- D. lag phase.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

27. When an infectious disease cannot spread in a population because it lacks a significant number of susceptible hosts, the phenomenon is referred to as

- A. protected population.
- B. active immunity.
- C. passive immunity.
- D.** herd immunity.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

28. The immunity of some black Africans to malaria is probably due to their

- A. general health.
- B. cultural practices.
- C. age.
- D.** genetic background.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

29. The type of epidemiological study that determines the characteristics of the persons involved and the time and place of the outbreak is called a(n)

- A. inspection study.
- B.** descriptive study.
- C. cohortive study.
- D. retrospective study.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.04

Section: 19.04

Topic: Epidemiology

30. The first identified case in an outbreak is called the

- A. starter case.
- B. traceable case.
- C. primary case.
- D.** index case.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.05

Section: 19.04

Topic: Epidemiology

31. If the number of people who become ill during an epidemic rises and falls rapidly, this is called a(n)

- A. propagated epidemic.
- B. promulgated epidemic.
- C.** common source epidemic.
- D. index epidemic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.05

Section: 19.04

Topic: Epidemiology

32. If the number of people who become ill during an epidemic rises gradually, this is called a(n)

- A.** propagated epidemic.
- B. promulgated epidemic.
- C. common source epidemic.
- D. index epidemic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.05

Section: 19.04

Topic: Epidemiology

33. An experimental study in which neither the doctor nor the patient knows who is getting the actual treatment is called

- A. single-sided.
- B. double-sided.
- C. double-blind.**
- D. double-barrier.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.05

Section: 19.04

Topic: Epidemiology

34. Because of the natural evolution of microorganisms, it is necessary to use techniques that allow distinguishing them at the level of

- A. species.
- B. genera.
- C. family.
- D. strain.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.09

Section: 19.06

Topic: Epidemiology

35. The publication of the CDC that reports new cases of reportable infectious diseases is titled

- A. Morbidity and Mortality Weekly Report (MMWR).**
- B. State Health News Letter (SHNL).
- C. Federal Report of Infectious Disease (FRID).
- D. National Morbidity Weekly.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 19.06

Section: 19.03

Topic: Epidemiology

36. The World Health Organization (WHO) is part of the
- A. Food and Drug Administration.
 - B. Department of Health and Human Services.
 - C. Department of Human Resources.
 - D.** United Nations.
 - E. North Atlantic Treaty Organization (NATO).

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.06

Section: 19.05

Topic: Epidemiology

37. WHO has targeted for elimination of
- A. polio.
 - B. dracunculiasis.
 - C. measles.
 - D. plague.
 - E.**

polio, dracunculiasis, AND measles.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.06

Section: 19.05

Topic: Epidemiology

Chapter 19 - Epidemiology

38. So far, the only disease that has been globally eradicated is

A.

polio.

B.

smallpox.

C.

measles.

D.

diphtheria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.06

Section: 19.05

Topic: Epidemiology

39. A new serotype of *Vibrio cholerae*, *V. cholerae* 0139, has picked up the ability to produce

A. pili.

B. flagella.

C. capsules.

D. toxin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.09

Section: 19.06

Topic: Infection and Disease

Chapter 19 - Epidemiology

40. Schistosomiasis has increased in areas where

- A. snails have become a delicacy.
- B. crayfish are eaten.
- C. dams have been built.**
- D. swamps have been drained.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.10

Section: 19.06

Topic: Epidemiology

41. Approximately what percentage of hospitalized patients may develop a nosocomial infection?

- A. 0%
- B. 5%**
- C. 20%
- D. 70%

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

42. An infection acquired during hospitalization is referred to as

- A. antibiotic-induced.
- B. therapeutic.
- C. medication-stimulated.
- D. nosocomial.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

43. Which of the following may be associated with nosocomial disease?

A. *Enterococcus* species.

B.

Clostridium difficile.

C. *Pseudomonas* species.

D. *Staphylococcus aureus*.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

44. Which of the following contributes to nosocomial disease?

A.

Susceptible population

B.

Hospital environment

C.

Other patients

D.

Patient's own normal microbiota

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

45. The member of the hospital staff who surveys the types and numbers of nosocomial infections is called the

- A. head nurse.
- B. staff control.
- C. attending physician.
- D.** infection control practitioner.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.13

Section: 19.07

Topic: Epidemiology

46. The guidelines designed for prevention of nosocomial disease during care of all patients is called

- A. Universal Disposables.
- B. Disinfection Manifesto.
- C. Asepsis Preference.
- D.** Standard Precautions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.13

Section: 19.07

Topic: Epidemiology

47. Transmission-Based Precautions

- A. is a course health workers must take.
- B. are guidelines from WHO for dealing with emerging diseases.
- C. are instructions on the care of all patients.
- D.** are guidelines to use with patients infected with a highly transmissible or epidemiologically important pathogen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.13

Section: 19.07

Topic: Epidemiology

48. Prevention of patient-to-personnel transmission of disease keys on limiting contact with
- A. patients.
 - B. personnel.
 - C. administrators.
 - D. physicians.
 - E.** body fluids.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

49. Which of the following is recommended by the Standard Precautions guidelines?

A.

Glove use

B.

Hand washing

C.

A face shield

D.

Antibiotic use

E.

Glove use, hand washing, AND a face shield

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.13

Section: 19.07

Topic: Epidemiology

50. The threat of bioterrorism

- A. is due largely to the ease of spread and severity of diseases.
- B. is exaggerated in light of the efficiency of our healthcare system.
- C. may include rarely seen infectious agents.
- D. has prompted WHO to prepare a readiness plan.
- E.** is due largely to the ease of spread and severity of diseases AND may include rarely seen infectious agents.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.13

Section: 19.07

Topic: Epidemiology

True / False Questions

51. Generally, the smaller the infective dose, the lower the chance of disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

52. A fly may serve as a mechanical vector.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

53. The portal of entry typically has little effect on the course of a disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.02

Section: 19.02

Topic: Epidemiology

54. The very young and the elderly are more susceptible to infectious disease.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

55. Diseases with long incubation periods are more likely to spread extensively.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.05

Topic: Epidemiology

56. A gradual rise in numbers during an epidemic indicates a common source epidemic.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.05

Section: 19.05

Topic: Epidemiology

57. Cross-sectional surveys are very useful in establishing cause of a disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.04

Section: 19.04

Topic: Epidemiology

58. A placebo is a mock drug.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.04

Section: 19.04

Topic: Epidemiology

59. In a double-blind test the treating physician knows who is getting the actual treatment.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.04

Section: 19.04

Topic: Epidemiology

60. Nosocomial infections are those acquired at a hospital.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 19.12

Section: 19.07

Topic: Epidemiology

61. Human population growth and expansion contribute to emergence of diseases.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 19.10

Section: 19.06

Topic: Epidemiology

Multiple Choice Questions

62. Explain the most likely reason why smallpox was successfully eradicated but rabies probably never will be.

- A.** Smallpox was ONLY found in humans; rabies is found in numerous animal reservoirs. We cannot reasonably eliminate rabies in all of the animal reservoirs that exist.
- B. Smallpox was far easier to vaccinate the world population against than rabies is due to the lower number of injections required-it becomes a compliance issue.
- C. Since there are very few cases of rabies each year, there is little financial incentive to push health organizations to eradicate the illness through worldwide vaccination.
- D. The symptoms of smallpox are easier to identify than the symptoms of rabies, so some carriers of rabies are not accurately diagnosed. This can lead to asymptomatic carriers present within the population of susceptible individuals, spreading the virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 19.08

Section: 19.05

Topic: Epidemiology

63. Explain how the incubation period can influence the spread of an infectious agent.

A.

An infectious carrier will only spread the illness when they are showing acute symptoms. As such, the length of incubation period is not important for spreading the illness.

B.

Depending on the microbe and the illness, an asymptomatic carrier in the incubation period might be shedding infectious microbes to his/her surroundings. In such a case, a longer incubation period would lead to a greater spread of the disease as the carrier comes into contact with more individuals while he/she is generally appearing to be healthy.

C.

A very short incubation period will place a patient into the highly infectious active disease state sooner. Since people avoid contact with actively ill individuals, a very short incubation period will always lead to a DECREASE in the spread of an infectious disease.

D.

A very long incubation period will place a patient into the highly infectious active disease state later. Since people generally avoid contact with actively ill individuals, a very long incubation period will always lead to a DECREASE in the spread of an infectious disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 19.03

Section: 19.03

Topic: Epidemiology

64. Why is it important to include a placebo in a scientific study to assess the effectiveness of a drug?

A. It's actually unethical to do so-if you have a drug that you know to be effective, it's unethical to withhold that treatment from an ill patient.

B. A placebo-treated group will determine if the changes observed in the drug-treated illness group are due to a psychological effect rather than a physiologic/pharmacologic one.

C. It isn't scientifically important-a placebo simply helps investigators satisfy the legal requirements of the Food and Drug Administration in their testing process.

D. A placebo-treated group will determine if the changes observed in the illness in this non-treated group are due to a physiologic/pharmacologic effect rather than a psychological one.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 19.04

Section: 19.04

Topic: Epidemiology

65. Which of the following is NOT a political/societal reason for a decrease in rates of childhood immunizations?

A.

Distrust of the healthcare body administering the vaccinations

B.

Distrust of the government funding the vaccination process

C.

A lack of a proper "cold chain" for stable transport of vaccines into tropical areas

D.

Distrust of the scientific community advocating for administration of vaccines

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 19.10

Section: 19.06

Topic: Epidemiology

Chapter 20 Antimicrobial Medications

Multiple Choice Questions

1. One of the earliest researchers to explore the use of chemicals to kill microbial pathogens was
- A. Koch.
 - B. Hooke.
 - C. Fleming.
 - D. Ehrlich.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 1. Remember
Learning Outcome: 20.01
Section: 20.01
Topic: History of Microbiology

2. The arsenic compound that proved highly effective in treating syphilis was called
- A. penicillin.
 - B. sulfa.
 - C. erythromycin.
 - D. Salvarsan.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 1. Remember
Learning Outcome: 20.01
Section: 20.01
Topic: History of Microbiology

3. The first example of an antimicrobial drug synthesized in the laboratory was

- A. penicillin.
- B. sulfa.
- C. erythromycin.
- D.** Salvarsan.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: History of Microbiology

4. Prontosil effectively acted on streptococci when the drug was split by enzymes to produce

- A. penicillin.
- B.** sulfanilamide.
- C. erythromycin.
- D. Salvarsan.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: Antimicrobial Medications

5. The use of Salvarsan and Prontosil to treat microbial infections were early examples of

- A. antibiotics.
- B. toxins.
- C. inhibitors.
- D.** chemotherapy.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: Antimicrobial Medications

Chapter 20 - Antimicrobial Medications

6. Penicillin was discovered by

- A. Koch.
- B. Hooke.
- C. Fleming.
- D. Ehrlich.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: History of Microbiology

7. The most effective form of penicillin is

- A. A.
- B. B.
- C. E.
- D. G.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.02

Section: 20.01

Topic: Antimicrobial Medications

8. One of the earliest antimicrobials isolated from a bacterium was

- A. penicillin.
- B. ampicillin.
- C. Salvarsan.
- D. streptomycin.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: Antimicrobial Medications

9. Which of the following groups of microorganisms produces antibiotics?

- A. *Penicillium*
- B. *Streptomyces*
- C. *Bacillus*
- D. *Penicillium* AND *Streptomyces*
- E.** All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.02

Section: 20.01

Topic: Antimicrobial Medications

10. An antibiotic made by microorganisms and modified by chemists is called

- A. anti-metabolic.
- B. catabolic.
- C. synthetic.
- D.** semi-synthetic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.02

Section: 20.01

Topic: Antimicrobial Medications

11. The antimicrobials produced by some molds and bacteria are generally called

- A. insecticides.
- B. biocides.
- C. antiseptics.
- D.** antibiotics.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.01

Section: 20.01

Topic: Antimicrobial Medications

12. The toxicity of a given drug is expressed as the

- A. selective toxicity.
- B. biocide index.
- C. biostatic index.
- D.** therapeutic index.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

13. A high therapeutic index is

- A. more toxic to the patient.
- B.** less toxic to the patient.
- C. has no effect on the patient.
- D. has no effect on the pathogen.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

14. Drugs that are bacteriostatic

- A. kill bacteria.
- B. promote bacterial growth.
- C. inactivate bacterial spores.
- D.** inhibit the growth of bacteria.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

15. Antimicrobials that kill microorganisms have the suffix

- A. -cidal.
- B. -static.
- C. -anti.
- D. -genic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

16. Antimicrobials that inhibit the growth of microorganisms have the suffix

- A. -cidal.
- B. -static.
- C. -anti.
- D. -genic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

17. Antibiotics that affect various strains of Gram-positive bacteria and various strains of Gram-negative bacteria are called

- A. isolate usable.
- B. stress-induced.
- C. narrow-spectrum.
- D. broad-spectrum.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

18. The rate of elimination of an antimicrobial is expressed as its

A. metabolic destructive rate.

B. half-life.

C. effective time.

D. dosage rate.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

19.

Antibiotics that are most likely to disrupt the normal microbiota are termed

A. narrow-spectrum.

B. broad-spectrum.

C. targeted spectrum.

D. semi-synthetic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

20. Drugs that are more effective when taken together are called

A. energetic.

B. antagonistic.

C. subtractive.

D. synergistic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

21. If drugs are less effective when taken together than when each is taken separately, they are called

- A. energetic.
- B. antagonistic.**
- C. additive.
- D. synergistic.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

22. Antimicrobials may produce

- A. allergic reactions.
- B. toxic effects.
- C.

suppression of normal microbiota.

D. All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

23. Which of the following bacteria have an innate resistance to penicillin?

- A. *S. aureus*
- B. *S. epidermidis*
- C. *M. luteus*
- D. *Mycoplasma***

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

Chapter 20 - Antimicrobial Medications

24. Which of the following drugs target peptidoglycan?

A.

Penicillin

B.

Cephalosporin

C.

Vancomycin

D.

Bacitracin

E. All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

25. All members of the penicillin family have

A. beta-lactam rings.

B. alpha-lactam rings.

C. phenolic rings.

D. sulfanilic rings.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

26. Penicillin-binding proteins

- A. primarily function in the cell to bind to beta-lactam drugs.
- B. are enzymes.
- C. are involved in cell wall synthesis.
- D. inhibit non-growing bacteria.
- E.** are enzymes AND are involved in cell wall synthesis.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

27. Beta-lactamases

- A. bind to penicillin-binding proteins.
- B. bind to peptides.
- C. prevent the linking of glycan chains in peptidoglycan.
- D.** break the beta-lactam ring.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

28. The major class(es) of antibiotics that inhibit protein synthesis is/are

- A. aminoglycosides.
- B. tetracyclines.
- C. macrolides.
- D. bacitracins.
- E.**

aminoglycosides, tetracyclines, AND macrolides.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

29. Inhibitors of protein synthesis typically key on

- A. peptidoglycan precursors.
- B. penicillin-binding proteins.
- C. ribosomes.**
- D. porin proteins.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

30. Which is true of aminoglycosides?

- A. They are bacteriostatic.
- B. They irreversibly bind to the 30S ribosomal subunit.
- C. They block peptidoglycan synthesis.
- D. They are bactericidal.
- E. They irreversibly bind to the 30S ribosomal subunit AND they are bactericidal.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

31. Fluoroquinolones typically target

- A. ribosomes.
- B. penicillin-binding proteins.
- C. peptidoglycan.
- D. DNA gyrase.**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

32. Sulfonamide and trimethoprim are both

- A. examples of metabolic inhibitors.
- B. folate inhibitors.
- C. protein synthesis inhibitors.
- D. inhibitors of cell wall synthesis.
- E.** examples of metabolic inhibitors AND folate inhibitors.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

33. Folic acid is ultimately used in the synthesis of

- A. topoisomerases.
- B. proteins.
- C. DNA gyrases.
- D. sulfonamides.
- E.** coenzymes.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

34. Sulfonamides are similar in structure to

- A. DNA gyrases.
- B. LPS.
- C. ribosomes.
- D.** PABA.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

35. Sulfonamides work as
- A. competitive inhibitors.
 - B. noncompetitive inhibitors.
 - C. ribosome-binding molecules.
 - D. feedback inhibitors.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

36. Trimethoprim and sulfonamides have a(n)
- A. antagonistic effect.
 - B. synergistic effect.
 - C. energetic effect.
 - D. subtractive.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.05

Section: 20.03

Topic: Antimicrobial Medications

37. Mycolic acids are targeted by isoniazid in the treatment of
- A. *S. aureus*.
 - B. *S. epidermidis*.
 - C. *M. luteus*.
 - D. *M. tuberculosis*.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.06

Section: 20.03

Topic: Antimicrobial Medications

38. The lowest concentration of a drug that prevents growth of a microorganism is the
- A. infectious dose.
 - B. lethal dose.
 - C. effective dose.
 - D.** minimum inhibitory concentration.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.07

Section: 20.04

Topic: Antimicrobial Medications

39. The minimum bactericidal concentration is the lowest concentration of a specific antimicrobial drug that kills _____ of a specific type of bacteria.
- A. 10%
 - B. 50%
 - C.** 99.9%
 - D. 100%

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.07

Section: 20.04

Topic: Antimicrobial Medications

40. The diffusion bioassay

- A. determines the concentration of antimicrobial necessary to kill a bacteria.
- B. determines the concentration of antimicrobial necessary to inhibit growth of a bacteria.
- C.

is similar in principle to the Kirby-Bauer test.

D. determines the concentration of antimicrobial in a fluid.

E.

is similar in principle to the Kirby-Bauer AND determines the concentration of antimicrobial in a fluid.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.08

Section: 20.04

Topic: Antimicrobial Medications

41. Which test is used to determine the susceptibility of a microorganism to an antimicrobial?

- A. MIC
- B. MIB
- C. MLB
- D. Kirby-Bauer test**

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 20.08

Section: 20.04

Topic: Antimicrobial Medications

42. The zone size obtained in the Kirby-Bauer test is influenced by the drug's
- A. size.
 - B. stability.
 - C. concentration.
 - D.** All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 2. Understand
Learning Outcome: 20.08
Section: 20.04
Topic: Antimicrobial Medications

43. A commercial modification of the disk diffusion test is called the
- A. A test.
 - B. B test.
 - C. C test.
 - D. D test.
 - E.** E test.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 1. Remember
Learning Outcome: 20.08
Section: 20.04
Topic: Antimicrobial Medications

44. Bacteria may become antibiotic resistant due to
- A. drug-inactivating enzymes.
 - B. alteration in the target molecule.
 - C. decreased uptake of the drug.
 - D. increased elimination of the drug.
 - E.** All of the choices are correct.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.
ASM Topic: Module 02 Structure and Function
Bloom's Level: 2. Understand
Learning Outcome: 20.09
Section: 20.05
Topic: Antimicrobial Medications

45. Spontaneous development of resistance to a particular antimicrobial is difficult if the drug

- A. binds to several sites on the target molecule.
- B. targets several different molecules.
- C. affects only one molecule.
- D. affects the plasma membrane.
- E.** binds to several sites on the target molecule AND targets several different molecules.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 3. Apply

Learning Outcome: 20.10

Section: 20.05

Topic: Antimicrobial Medications

46. The most common method of transfer of antimicrobial resistance is through the use of

- A. viruses.
- B.** R plasmids.
- C. introns.
- D. exons.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.10

Section: 20.05

Topic: Antimicrobial Medications

47. Compliance problems are leading to a large increase in antibiotic resistant strains of

- A. *Streptococcus*.
- B. *Staphylococcus*.
- C.** *Mycobacterium*.
- D. *Pseudomonas*.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.11

Section: 20.05

Topic: Antimicrobial Medications

48. Antiviral drugs may target

- A. uncoating.
- B. nucleic acid synthesis.
- C. viral assembly.
- D. viral ribosomes.
- E.**

uncoating, nucleic acid synthesis, AND viral assembly.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.13

Section: 20.06

Topic: Antimicrobial Medications

49. The target of most antifungal drugs is

- A. the ribosome.
- B. nucleus.
- C. cholesterol.
- D.** ergosterol.
- E. cholesterol AND ergosterol.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 20.14

Section: 20.07

Topic: Antimicrobial Medications

True / False Questions

50. The key characteristic of a useful antimicrobial is selective toxicity.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

51. Antimicrobials that have a high therapeutic index are less toxic to the patient.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

52.

Broad-spectrum antibiotics have minimal effect on the normal microbiota.

FALSE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

53. Certain antimicrobials may be life-threatening.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

54. Drugs that target peptidoglycan do not affect eukaryotes.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

55. Beta-lactam drugs are only effective against growing bacteria.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

56. The MBC may be determined by an extension of the MIC.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.07

Section: 20.04

Topic: Antimicrobial Medications

57. Antimicrobial resistance can be due to spontaneous mutation or gene acquisition.

TRUE

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.10

Section: 20.05

Topic: Antimicrobial Medications

58. Viruses are very effectively treated with antibiotics.

FALSE

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 2. Understand

Learning Outcome: 20.13

Section: 20.06

Topic: Antimicrobial Medications

59. Antifungal drugs usually target the cell membrane.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 20.14

Section: 20.07

Topic: Antimicrobial Medications

Multiple Choice Questions

60. In what clinical situation is it most appropriate to use a broad-spectrum antimicrobial?

A. In an example of a pediatric otitis media (middle ear) infection. We can't properly test for the specific drug that would best eliminate the infection due to its location, so we use a broad-spectrum drug instead.

B. In a case of viral meningitis. The infection spreads so quickly that we must treat it with an antibacterial drug as quickly as possible. We don't have time to determine which drug will work best, because the patient will die in the meantime.

C. In a case of bacterial meningitis. The infection spreads so quickly that we must treat it with an antibacterial drug as quickly as possible. We don't have time to determine which drug will work best, because the patient will die in the meantime.

D. In a case of *Staphylococcus aureus* skin infection. Since this microbe can be resistant to several types of drugs, we want to use one that has the broadest spectrum possible to treat this microbe-specific infection.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

61. Why would antimicrobials that have toxic side effects be used at all (select the BEST reason)?

A. We want the largest possible number of choices of drugs in case a microbe shows resistance. With more possible weapons (even toxic ones), we have greater ability to eliminate infections.

B. Every person is different. What is toxic to one person may not be toxic to another person. To eliminate a useful drug because it's toxic to 1% of people treated is a waste.

C. Depending on the location of the infection, we may have no choice but to utilize a drug that has some toxic side effects to the patient.

D. They shouldn't be used. We have enough of a selection of drugs that we can always select a drug with no toxicity. Drugs with toxicity are simply leftovers-relics from a time when we didn't have as many drug options.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.03

Section: 20.02

Topic: Antimicrobial Medications

62. Why would co-administration of a bacteriostatic drug interfere with the effects of penicillin?

- A. Since most bacteriostatic drugs are produced from bacteria, but penicillin is produced from mold, the two drugs are incompatible with each other.
- B. A bacteriostatic drug produces interference in the ability of a bacterial cell to take in compounds from the outside environment. Penicillin must be taken in by the cell in order to have its effect, so this would directly inhibit it.
- C.**

Penicillin interferes with cell wall production/stabilization by cross-linking of peptidoglycan. As such, it only works when the cells are actively replicating and MAKING new peptidoglycan. A bacteriostatic drug works by shutting down replication, holding the cells "static." This would interfere with the mode of action required by the penicillin.

D. The bacteriostatic drugs would bind directly to the penicillin, preventing both its uptake by the cell and its ability to perform its duty within the bacterial cell.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.04

Section: 20.03

Topic: Antimicrobial Medications

63. Why would it be important for the Kirby-Bauer disc diffusion test to use a standard concentration (number of cells in the sample) of each of the bacterial strains being tested?

A. Antibiotics only work within a narrow range of cell concentrations. If you use a concentration that is too low or too high, you will get inaccurate measurements of the zone of inhibition.

B.

Antibiotic resistance is usually only manifested by bacteria that have achieved a very high concentration (i.e., they are in the very end of the stationary phase of the growth curve). It's important to use bacteria specifically at this particular point for disc diffusion testing.

C.

If you were to use one strain that was stationary phase (high concentration, replicating very slowly or not at all), and another strain that was just beginning log phase (low concentration but replicating quickly), you could see dramatically different results in the disc diffusion test. This could skew your interpretations of resistance/susceptibility.

D. Growth on the Mueller-Hinton agar plates utilized is very sensitive to the phase of the growth curve the bacteria are in when they are placed on the plate. If they are not in the log phase when they are placed on the plate, they will not grow and the test will be worthless.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.08

Section: 20.04

Topic: Antimicrobial Medications

64. Explain how using a combination of two antimicrobial drugs helps prevent the development of spontaneously resistant mutants.

A. All drugs work synergistically with each other-that is, their combined effects are far greater than either could achieve individually. Two drugs together helps to eliminate microbes, even if they have developed spontaneous mutations that would confer upon them resistance to the drugs.

B.

It is highly unlikely that the microbe might spontaneously develop two specific mutations to resist the effects of a pair of drugs. As such, even if one drug is resisted by the microbe, the second drug will eliminate the mutated microbe, thus preventing the development of spontaneously resistant mutants overall.

C. All drugs work antagonistically with each other-that is, their combined effects are far greater than either could achieve individually. Two drugs together helps to eliminate microbes, even if they have developed spontaneous mutations that would confer upon them resistance to the drugs.

D. Drugs can also select for mutations that will enhance the activity of another drug. So, each of the paired drugs will help to select for spontaneous mutations that enhance the activity of the other drug in the pair.

ASM Objective: 02.01 Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.10

Section: 20.05

Topic: Antimicrobial Medications

65. Why are nucleoside analogs active only against replicating viruses?

A. These drugs can only be taken up by cells that are infected by viruses. They are shut out from non-infected cells. This makes them effective only against cells where viruses are replicating.

B. Each of these drugs is specifically activated by enzymes produced by the viruses. The viruses will only produce these enzymes when they are replicating, so the drugs can only become activated when these processes are occurring.

C. Nucleoside analogs work by directly inhibiting the activity of nucleic acid polymerases. If the virus isn't actively replicating, there's no DNA/RNA polymerase active for the drug to inhibit, so the drug cannot work.

D. Nucleoside analogs work by being incorporated into growing strands of DNA/RNA. This indirectly shuts down further extension of these chains. However, new strands of viral DNA/RNA are only being created when the virus is replicating. As such, these drugs can only work when the virus is actively replicating as well.

ASM Objective: 02.03 The replication cycles of viruses (lytic and lysogenic) are dependent on living host cells and determined by their unique genomes and structures.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 5. Evaluate

Learning Outcome: 20.13

Section: 20.06

Topic: Antimicrobial Medications

Chapter 21 Respiratory System Infections

Multiple Choice Questions

1. The process used for identifying the different carbohydrates of streptococci is called
A. Lancefield grouping.
B. CHO typing.
C. streptococci.
D. fermentation testing.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

2. Rebecca Lancefield showed that almost all the strains of b-hemolytic streptococci from human infections

A. could cause rheumatic fever.

B.

had the same cell wall carbohydrate "A."

C. had variable cell wall carbohydrates.

D. responded to penicillin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

3. The scientist who developed a system of identifying the variety of strains of streptococci was

- A. Hans Zimmer.
- B. Donald Sutherland.
- C. O. T. Avery.
- D.** Rebecca Lancefield.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

4. Enlargement of which of the following structures may contribute to ear infections by interfering with normal drainage from eustachian tubes?

A.

Nasal chamber

B.

Nasal conchae

C.

Epiglottis

D.

Adenoids

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

5. The conjunctivae

A.

have few resident bacteria.

B. are often covered with bacteria.

C. are populated with *S. aureus*.

D. are populated with *S. pyogenes*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.02

Section: 21.01

Topic: Respiratory System Infections

6. The eyes are protected from infection by

A. the washing action of the tears and eyelids.

B. the chemical action of lysozyme.

C. the use of contact lenses.

D. the dryness of the eye surface.

E. the washing action of the tears and eyelids AND the chemical action of lysozyme.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.02

Section: 21.01

Topic: Respiratory System Infections

Chapter 21 - Respiratory System Infections

7. The cause of strep throat is

A.

Staphylococcus aureus.

B.

Streptococcus pyogenes- beta-hemolytic, group A.

C.

Staphylococcus pyogenes- alpha-hemolytic, group B.

D.

Streptococcus pneumoniae.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

8. Which of the following is associated with the upper respiratory system?

A.

Humidifying inhaled air

B.

Warming inhaled air

C.

Cooling inhaled air

D.

Drying inhaled air

E.

Humidifying inhaled air AND warming inhaled air

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

9. Rapid diagnostic tests for streptococcal infections may utilize

A. blood agar.

B. antibodies.

C. DNA probes.

D. the Kirby-Bauer test.

E. antibodies AND DNA probes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

10. Virulence factors used by *S. pyogenes* may be

- A. Protein F.
- B. M Protein.
- C. a capsule.
- D. Protein G.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

11. The disease characterized by the appearance of a toxin-mediated rash that spares the area around the mouth and causes the tongue to look like the surface of a ripe strawberry is

- A. measles.
- B. chickenpox.
- C. strep throat.
- D.** scarlet fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

12. A bacteriophage is necessary for toxin production in

- A. *E. coli*.
- B. *Staphylococcus aureus*.
- C. *Streptococcus pyogenes*.
- D.** *C. diphtheriae*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

Chapter 21 - Respiratory System Infections

13. Diphtheria toxin works on

- A. lysosomes.
- B. mitochondria.
- C. chloroplasts.
- D.** elongation factor 2.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

14. Which is used in the vaccination for *C. diphtheriae*?

A.

Protein A

B. M protein

C.

Toxoid

D.

Red blood cells

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

Chapter 21 - Respiratory System Infections

15.

The most common bacterial pathogen(s) involved with sinusitis, otitis media, and conjunctivitis is/are

A.

S. aureus.

B.

H. influenzae.

C.

S. pneumoniae.

D.

S. epidermidis.

E.

H. influenzae AND *S. pneumoniae*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.04

Section: 21.02

Topic: Respiratory System Infections

16. Otitis media and sinusitis are usually preceded by a(n)

- A. middle ear infection.
- B. pseudomonal infection.
- C. oropharyngeal infection.
- D.** nasopharyngeal infection.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.04

Section: 21.02

Topic: Respiratory System Infections

17. Otitis media probably develops from an infection that spread

- A. from the outer ear to the middle ear.
- B. from the sensory neurons of the middle ear.
- C. through the tympanic membrane.
- D.** upward through the eustachian tube.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.04

Section: 21.02

Topic: Respiratory System Infections

18. Most colds are probably caused by

- A.** rhinovirus.
- B. *S. aureus*.
- C. *Pseudomonas* sp.
- D. *E. coli*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

Chapter 21 - Respiratory System Infections

19. Rhinoviruses need to be grown

- A. in living cells.
- B. in synthetic media.
- C. on blood agar.
- D. at 33°C.
- E.** in living cells AND at 33°C.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

20. The rhinovirus contains

A.

single-stranded RNA and is an enveloped virus.

B.

double-stranded RNA and is an enveloped virus.

C.

single-stranded RNA and and is a non-enveloped virus.

D.

double-stranded RNA and is a non-enveloped virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

Chapter 21 - Respiratory System Infections

21. The reservoir of the common cold is the

- A. family pet.
- B. human.**
- C. infected fomite.
- D. fruit.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

22. A vaccine for the common cold is not feasible because

- A. the surface antigens of rhinovirus mutate frequently.
- B. the cause is unknown.
- C. the rhinovirus cannot be grown in sufficient quantities.
- D. there are more than 100 types of rhinovirus.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

23. Colds are effectively treated with

- A. antibiotics.
- B. aspirin and acetaminophen.
- C. proteases.
- D. nucleotide analogs.
- E. None of the choices is correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

24. Effective preventive methods for avoiding the common cold is/are

- A. hand washing.
- B. avoiding crowds.
- C. not touching one's face.
- D. avoiding close contact with people with colds.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

25. The disease that closely resembles "strep throat" but is of viral origin is

- A. the common cold.
- B. otitis media.
- C. tonsillitis.
- D.** adenoviral pharyngitis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.06

Section: 21.03

Topic: Respiratory System Infections

26. Adenoviral pharyngitis is effectively treated with

- A. antibiotics.
- B. lysozyme.
- C. proteases.
- D. nucleotide analogs.
- E.** None of the choices is correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.06

Section: 21.03

Topic: Respiratory System Infections

27. Which of the following are considered diseases of the lower respiratory tract?

A.

Diphtheria and pneumonia

B.

Influenza and diphtheria

C.

Tuberculosis and pneumonia

D.

Common cold and tuberculosis

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

28. About 60% of the bacterial pneumonias that require hospitalization of adults are caused by

A. *S. pyogenes*.

B. *S. pneumoniae*.

C. *S. aureus*.

D. *K. pneumonia*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

29. The characteristic virulence factor of *S. pneumoniae* is

- A.** a capsule.
- B. flagella.
- C. pili.
- D. cilia.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

30. The key virulence factor of *S. pneumoniae* interferes with

- A. the action of C3.
- B.** the action of C3b.
- C. the action of C5a.
- D. interferon.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

31. The pneumococcal vaccine is directed against the

- A. flagella.
- B. pili.
- C. cilia.
- D.** capsule.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 21.05

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

32. Both *S. pneumoniae* and *K. pneumoniae* use this as a virulence factor.

A.

Pili

B.

Flagella

C.

Capsules

D.

Cilia

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

33.

The causative agent of the pneumonia that results in permanent lung damage, may be nosocomial, and has a high mortality if untreated is

A. *S. pneumoniae*.

B. *K. pneumoniae*.

C. *S. pyogenes*.

D. *S. aureus*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

34. The virulence of *Klebsiella* is due partly to the

- A. motility of the organism.
- B. exotoxin produced.
- C. engorgement of blood vessels.
- D. antiphagocytic properties of their capsules.**
- E. exotoxin produced AND antiphagocytic properties of their capsules.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

35. The resistance of *Klebsiella* to antibiotics may be

- A. chromosomal mediated.
- B. plasmid mediated.
- C. lysosomal mediated.
- D. capsule mediated.
- E. chromosomal mediated AND plasmid mediated.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

36. Mycoplasmal and klebsiellal pneumonias

- A. have similar incubation periods.
- B. have causative agents that lack cell walls.
- C. are serious diseases often requiring hospitalization.
- D. are both relatively mild diseases.
- E. None of the choices is correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

37. The spread of mycoplasma is through
- A. inhalation of infected droplets.
 - B. the fecal-oral route.
 - C. an insect vector.
 - D. a fomite.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

38. Which is/are true of coccidioidomycosis and histoplasmosis?
- A. They are both soil fungi.
 - B. They are both dimorphic fungi.
 - C. They are both life-threatening.
 - D. They may be treated with antibiotics.
 - E. They are both soil fungi AND they are both dimorphic fungi.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.12

Section: 21.06

Topic: Respiratory System Infections

39. Which antibiotics may be completely ineffective in treating a mycoplasmal infection?

A.

Penicillin

B.

Cephalosporin

C.

Tetracycline

D.

Erythromycin

E.

Penicillin AND cephalosporin

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

40. The sudden, violent, uncontrollable cough of pertussis is described as

A. productive.

B. contagious.

C. infective.

D. paroxysmal.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

41. The causative agent of whooping cough is

- A. parvovirus.
- B. *M. pneumoniae*.
- C. *B. pertussis*.
- D. *S. aureus*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

42. Pertussis toxin

- A. uses part B to attach to receptors on the host cell.
- B. uses part A to inactivate G protein.
- C. affects the level of cAMP in a cell.
- D. affects the level of mucus secretion.
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

43. Although unusually resistant to many control factors, the tubercle bacillus is easily killed by

- A. strong acids.
- B. disinfectants.
- C. pasteurization.
- D. strong alkalis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

44. The resistance of the tubercle bacillus to various factors is probably due to its
- A. capsule.
 - B. larger ribosomes.
 - C. ability to adhere tightly.
 - D.** cell wall.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

45. The virulence of the tubercle bacillus is due to its
- A. toxin.
 - B. lysogenic conversion.
 - C. resistance to antibiotics.
 - D.** survival within macrophages.
 - E. lysogenic conversion AND resistance to antibiotics.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

46. The destructive nature of tuberculosis can be characterized as a(n)
- A. endotoxin pyrogenic response.
 - B. immune complex reaction.
 - C. inflammatory response.
 - D.** delayed hypersensitivity reaction.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

47. Influenza is caused by

- A. orthomyxovirus.
- B. *H. influenza*.
- C. cytomegalovirus.
- D. adenovirus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.09

Section: 21.05

Topic: Respiratory System Infections

48. Projecting from the outer envelope of the influenza virus are two glycoproteins called

- A. leukocidin and hemolysin.
- B. hyaluronidase and coagulase.
- C. hemagglutinin and neuraminidase.
- D. lysozyme and coagulase.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.09

Section: 21.05

Topic: Respiratory System Infections

49. Antigenic shifts may be the result of

- A. two different viruses infecting a cell at the same time.
- B. the lysogenic conversion of two viruses.
- C. conjugation of two viruses.
- D. blending of a bacterial and a viral genome.
- E. the lysogenic conversion of two viruses AND blending of a bacterial and viral genome.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.09

Section: 21.05

Topic: Respiratory System Infections

50. Which is true of hantavirus?

- A. It is a zoonosis involving mice.
- B. It has three segments of single-stranded RNA.
- C. The primary effect is to flood the lungs with fluid.
- D.

Shock and death occurs in 30% of the cases.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.10

Section: 21.05

Topic: Respiratory System Infections

51. Two relatively widespread North American lung mycoses are

- A. candidiasis and coccidioidomycosis.
- B. candidiasis and aspergillosis.
- C. aspergillosis and Reyes syndrome.
- D.** coccidioidomycosis and histoplasmosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.12

Section: 21.06

Topic: Respiratory System Infections

True / False Questions

52. Streptococci are grouped by their cell wall carbohydrates.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

53. Otitis media is an infection of the middle ear that is rare in the first month of life.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 21.04

Learning Outcome: 21.05

Section: 21.02

Topic: Respiratory System Infections

54. Humans are the only source of the cold virus.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

55. Rhinoviruses are effectively treated with antibiotics.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

56. Of infectious diseases, pneumonia is a major killer in the general population.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

57. A vaccine is available for protection from pneumococcal pneumonia.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

58.

Klebsiellae easily acquire and are a source of R factors.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

59. Pneumonias are inflammatory diseases of the lung in which fluid fills the alveoli.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

60. Mycoplasma is effectively treated with cell wall inhibiting antibiotics.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

61. Histoplasmosis may mimic tuberculosis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.11

Section: 21.06

Topic: Respiratory System Infections

Multiple Choice Questions

62. What is the most likely reason why smokers are more at risk for respiratory system infections?

- A. Cigarette smoke is carcinogenic (cancer-causing), leading to a much higher incidence of lung cancer.
- B. They aren't-this is just a rumor used to get people to stop smoking.
- C.** Chemicals in cigarette smoke can impair the mucociliary escalator, preventing natural cleansing of the respiratory tract.
- D. Smokers take in microbes from their hands into their lungs as they handle cigarettes and inhale the smoke.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.01

Section: 21.01

Topic: Respiratory System Infections

63. Pleurisy and pneumonia are different. Why?

- A. Pleurisy is inflammation of the lungs, while pneumonia is infection of the linings that surround the lungs. One is inflammation (not necessarily due to a microbe!), while the other is active infection with a microbe.
- B.** Pneumonia is infection of the lungs, while pleurisy is inflammation of the linings that surround the lungs. One is inflammation (not necessarily due to a microbe!), while the other is active infection with a microbe.
- C. Pleurisy is caused by viruses, while pneumonia is caused by bacteria.
- D. Pneumonia is caused by viruses, while pleurisy is caused by bacteria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 21.02

Section: 21.01

Topic: Respiratory System Infections

64. Why would it be reasonable to treat strep throat with antibacterial antibiotics, but not diphtheria?

- A.** The illness in diphtheria is largely from the exotoxin produced. An antibiotic won't clear out the exotoxin.
- B. The illness in strep throat is largely from the exotoxin produced. An antibiotic effectively eliminates exotoxins.
- C. The causative agent of diphtheria is a virus, not a bacterium. The drug would have no effect.
- D. There are no antibiotics that have proven effective against the bacterium that causes diphtheria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.03

Section: 21.02

Topic: Respiratory System Infections

65. The best way to speed up recovery from a common cold is

- A. to dose the patient with ibuprofen to keep the fever down.
- B. to take decongestants as a means of alleviating the symptoms of the cold.
- C. to take 1,000 mg of vitamin C every day during the illness.
- D.** None of the above-in fact, the only way to clear out a cold is to let your immune system do its job. Several of the treatments above may actually INCREASE the time needed to get over the illness.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 21.05

Section: 21.03

Topic: Respiratory System Infections

66.

If you are a 20-year-old healthy young adult and you have to CHOOSE a type of pneumonia to become infected with (and you will NOT get treatment for it), which would be the "best," and why?

- A. Pneumococcal pneumonia-it doesn't destroy lung tissue and can be completely recovered from.
- B. Klebsiella pneumonia-it has the shortest recovery time.
- C. Mycoplasmal pneumonia-it has the mildest symptoms and is generally easily cleared out.**
- D. Viral pneumonia-there are many antiviral medications you can take for this version with very few side effects.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

67. Why are pneumococcal pneumonia infections so dangerous in nursing homes?

- A. There is no vaccine available for protection.
- B. There is no longer an antibiotic effective against the infection.
- C. This type of pneumonia causes permanent lung damage, and old people often have impaired lung function in the first place.
- D. While this type of pneumonia does NOT cause permanent lung damage, the immune system of older people is usually impaired, leaving them predisposed to more serious and potentially life-threatening pneumonia infections.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.07

Section: 21.04

Topic: Respiratory System Infections

68. People infected with *M. tuberculosis* are always highly infectious to everyone around them-true or false, and why?

A. True-they are constantly shedding bacteria to the environment around them in high numbers, facilitating transmission.

B. False-while in the early stages of the illness, their tissues are not irritated and damaged to induce the cough required to spread the organism in respiratory droplets very easily.

C. True-as the mode of transmission is direct contact, anyone or anything they touch can be infected.

D. False-since TB requires a very high infectious dose, in the early stages of the disease, the patients aren't producing enough bacteria in their respiratory secretions to be infectious.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.08

Section: 21.04

Topic: Respiratory System Infections

69. Which is more likely to happen-antigenic DRIFT, or antigenic SHIFT-and why?

A. Antigenic DRIFT-since infection with only a single virus is required, and the random mutations happen as the virus replicates in the infected person's cells.

B. Antigenic SHIFT-since infection with only a single virus is required, and the random mutations happen as the virus replicates in the infected person's cells.

C.

Antigenic DRIFT-since random mutations occur more readily when only one virus is infecting a cell at a given time.

D. Antigenic SHIFT-since multiple viruses in a cell at once means more RNA polymerase to copy the RNA, and therefore more possibilities for much larger mistakes to be made in the copying (leading to mutations).

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.09

Section: 21.05

Topic: Respiratory System Infections

70. Which is more dangerous to human beings-antigenic DRIFT or antigenic SHIFT-and why?

A.

Antigenic DRIFT-since this produces the quickest and largest degree of changes in the virus structure and we may not have immunity against it.

B.

Antigenic SHIFT-since this produces the quickest and largest degree of changes in the virus structure and we may not have immunity against it.

C. Antigenic DRIFT-the small changes make the virus look like something we already have an immune response in place for, but we actually don't. This lets the virus hide from the immune responses needed to clear it out for a longer period of time.

D.

Antigenic SHIFT-the process completely changes the virus 100%, allowing it to jump into different species (i.e., from birds into humans). As such, we have no responses in place for the new virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 21.09

Section: 21.05

Topic: Respiratory System Infections

Chapter 22 Skin Infections

Multiple Choice Questions

1. The Rickettsial disease that killed Howard Ricketts and Stanislaus Prowazek was
A. louse-borne typhus.
B. tick-borne typhus.
C. yellow fever.
D. bubonic plague.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

2. Which of the following is considered an important function of the skin?

A.

Hold muscle to bone

B.

Manufacture blood cells

C.

Produce antibodies

D.

Control body temperature

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

3. Which of the following is considered a function of the skin?

A.

Regulation of body temperature

B.

Prevention of fluid loss

C.

Synthesis of vitamin D

D.

Produces cytokines

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

4. The surface layer of the skin is the

A. cutaneous.

B. keratin.

C. dermis.

D. epidermis.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

5. The oily secretion that lubricates the hair follicles of the skin is

- A. sebum.
- B. eczema.
- C. suder.
- D. acne.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

6. The secretions of the sweat and sebaceous glands provide _____ to the microbiota.

- A. water
- B. amino acids
- C. lipids
- D. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

7. The antimicrobial aspect(s) of the skin is/are

- A. dryness.
- B. saltiness.
- C. acidity.
- D. toxicity.
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.01

Section: 22.01

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

8. Which of the following organisms is not normally found on the skin?

A.

Staphylococci

B.

Diphtheroids

C. *Candida* spp.

D. *Malassezia* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

9. Diphtheroids

A.

are part of the normal microbiota of the skin.

B. are responsible for body odor.

C. include *P. acnes*.

D. include *Malassezia* spp.

E.

are part of the normal microbiota of the skin, are responsible for body odor, AND include *P. acnes*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

10.

Which of the following normal skin microbiota is a small yeast?

A.

Staphylococci

B.

Diphtheroids

C. *Candida* spp.

D. *Malassezia* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

11. The growth of *P. acnes* within hair follicles, in many individuals, leads to

A. eczema.

B. carbuncles.

C. boils.

D. acne.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

12. The principal species of *Staphylococcus* found on the skin is

- A. *aureus*.
- B. *acnes*.
- C. *pyogenes*.
- D. *epidermidis*.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

13.

The bacteria that appear to maintain balance between the members of the normal microbiota and play a vital role in limiting colonization by pathogens are

- A. staphylococci.**
- B. diptheroids.
- C. *Candida* spp.
- D. *Malassezia* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

14. Which of the following may be added to normal media to make it more selective for staphylococci?

- A. 7.5% salt
- B. 0.5% HCl
- C. 1.0% glucose
- D. 5.0% mannose

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

15.

The member of the normal microbiota sometimes considered responsible for tinea versicolor is

- A. staphylococci.
- B. diptheroids.
- C. *Candida* spp.
- D. *Malassezia* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

16. Which is deemed the most serious staphylococcal skin infection?

A.

Tinea versicolor

B.

Folliculitis

C.

Furuncles

D.

Carbuncles

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

17. A protein associated with a more virulent form of *Staphylococcus* is

A. leukocidin.

B. mannose.

C. streptokinase.

D. coagulase.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

18. The protein produced by *S. aureus* that interferes with phagocytosis is

- A. protein M.
- B. collagen.
- C. protein A.**
- D. capsular protein.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

19. The preferred habitat of *S. aureus* is the

- A. throat.
- B. urethra.
- C. bladder.
- D. nasal chamber.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

20. Which of the following is a fairly reliable method of characterizing strains of *S. aureus*?

A.

Complement fixation

B.

Protein fingerprint

C.

Genome typing

D. LPS pattern

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

21. Which of the following may aid *Staphylococcus* in resisting phagocytosis?

A.

Leukocidin

B.

Hemolysin

C.

Granulation enzyme

D.

Coagulase

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

22. Which of the following virulence factors used by *Staphylococcus* puts holes in host cells?

A.

Protein A

B.

Alpha toxin

C.

Leukocidin

D.

Clumping factor

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

23. *S. aureus* clumping factor

A. causes fibrinogen to clump together.

B. causes bacteria to clump together in plasma.

C. reacts with prothrombin.

D. produces staphylothrombin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

24. The *S. aureus* product that causes scalded skin syndrome is/are
A. exfoliation toxin.
B. lipases.
C. leukocidins.
D. protein M.
E. All of the choices are correct.

Bloom's Level: 2. Understand
Learning Outcome: 22.04
Section: 22.02
Topic: Skin and Eye Infections

25.

Which is true of MRSA strains?

A.

They are all resistant to vancomycin.

B.

They carry the R plasmid.

C.

They may be susceptible to linezolid.

D.

They carry the R plasmid AND they may be susceptible to linezolid.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.
ASM Topic: Module 05 Systems
Bloom's Level: 2. Understand
Learning Outcome: 22.03
Section: 22.02
Topic: Skin and Eye Infections

26. A frequent complication of scalded skin syndrome is a secondary infection caused by

- A. *M. luteus*.
- B. *S. pyogenes*.
- C. *S. epidermidis*.
- D. *Pseudomonas* spp.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.04

Section: 22.02

Topic: Skin and Eye Infections

27. In addition to *S. aureus*, impetigo may also involve

- A. *M. luteus*.
- B. *S. pyogenes*.**
- C. *S. epidermidis*.
- D. *Pseudomonas* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.04

Section: 22.02

Topic: Skin and Eye Infections

28. In *S. pyogenes*, which of the following interferes with phagocytosis?

A. M protein

B.

Protein A

C.

Collagen

D.

Pilin

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.04

Section: 22.02

Topic: Skin and Eye Infections

29. In which of the following does a rash start on the palms and soles and progress toward the trunk?

A. Epidemic typhus

B. Typhoid

C. Lyme disease

D. Impetigo

E. Rocky Mountain spotted fever

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

30.

The major vector of Rocky Mountain spotted fever in the western United States is

- A. *Rickettsia rickettsi*.
- B. *Rickettsia prowazeki*.
- C. *Borrelia burgdorferi*.
- D. *Dermacentor andersoni*.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

31. Rocky Mountain spotted fever is an example of a(n)

- A. animalosis.
- B. tickonosis.
- C. plantonosis.
- D. zoonosis.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

32. After being bitten by an infected tick, transfer of the rickettsial organism occurs

- A. immediately.
- B. within 5 minutes.
- C. within 20 minutes.
- D. within 4-10 hours.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

33. Which of the following is an obligate intracellular parasite?

- A. *M. luteus*
- B. *S. pyogenes*
- C. *Rickettsia rickettsi*
- D. *Pseudomonas* spp.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

34. The causative agent of Lyme disease is

- A. *Rickettsia rickettsi*.
- B. *Rickettsia prowazeki*.
- C. *Borrelia burgdorferi*.
- D. *Dermacentor andersoni*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

35. The unique characteristic of Lyme disease is

- A. erythema migrans.
- B. induration.
- C. carbuncle.
- D. furuncle.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

36. The stage of Lyme disease that is characterized by arthritis is the

- A. primary.
- B. third.**
- C. second.
- D. fourth.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

37.

The most important vector of Lyme disease in the eastern United States is

- A. *Dermacentor virabilis*.
- B. *Dermacentor andersoni*.
- C. *Staphylococcus aureus*.
- D. *Ixodes scapularis*.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

38. Which of the following pertains to *Borrelia burgdorferi*?

A.

Coccus

B.

Bacillus

C.

Spirochete

D.

Filament

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

39. The preferred host of *Ixodes scapularis* is the

A. wood rat.

B. white-footed mouse.

C. moose.

D. human.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

40. The growth stage of the vector that is mainly responsible for transmitting Lyme disease is the

- A. nymph stage.
- B. egg.
- C. moult.
- D. adult.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

41. Many childhood diseases caused by viral infections of the upper respiratory tract can usually be diagnosed by

- A. inspection of the rash.
- B. the type of cough.
- C. the type of fever.
- D. the incubation period.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

42.

A common viral rash of childhood with the popular name chickenpox is also known as

- A. bariola.
- B. rubella.
- C. rubeola.
- D.** varicella.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

43. The varicella virus is a member of which virus family?

A.

Paramyxo

B.

Toga

C.

Papilloma

D.

Herpes

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

44. Reactivation of chickenpox is called

- A. shingles.
- B. herpes zoster.
- C. pneumonia.
- D. exanthems.
- E. shingles AND herpes zoster.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

45. The childhood disease that damages the body defenses and is frequently complicated by secondary infections involving, primarily, Gram-positive cocci is

- A. German measles.
- B. measles.**
- C. mumps.
- D. chickenpox.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

46. The rubeola virus contains

- A. double-stranded RNA.
- B. single-stranded DNA.
- C.

double-stranded DNA.

D. single-stranded RNA.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

47.

Rubella, rubeola, and varicella-zoster are all only acquired via

- A. the gastrointestinal route.
- B.** the respiratory route.
- C. wounds.
- D. blood transfusions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

48. An important diagnostic sign of measles is

- A. Koplik's spots.
- B. giant cells.
- C. fever.
- D. swollen lymph nodes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

49. The MMR vaccine is used to protect against

- A. mononucleosis, mange, rubeola.
- B. measles, mange, rubeola.
- C. mononucleosis, mumps, rubella.
- D. measles, mumps, rubella.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

50. The most serious consequence of rubella is

- A. encephalitis.
- B. meningitis.
- C. deafness.
- D. birth defects.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

Chapter 22 - Skin Infections

51. Rubella is a member of which virus family?

A.

Paramyxo virus

B.

Herpes

C.

Togavirus

D.

Papovavirus

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

52. Warts are caused by

A. papillomavirus.

B. parvovirus.

C.

adenoviruses.

D. herpes virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.08

Section: 22.03

Topic: Skin and Eye Infections

53. The skin-invading molds belong to the genera

- A. *Epidermophyton*.
- B. *Microsporum*.
- C. *Trichophyton*.
- D. *Ixodes*.
- E.**

Epidermophyton, Microsporum, AND Trichophyton.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.09

Section: 22.04

Topic: Skin and Eye Infections

True / False Questions

54. Coagulase-positive *S. aureus* is often involved in disease.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.03

Section: 22.02

Topic: Skin and Eye Infections

55. *Borrelia burgdorferi* is a spirochete with a number of axial filaments.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

56. Varicella is a member of the herpes family of viruses and produces a latent infection.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

57. Humans are the only reservoir for varicella-zoster.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

58. Complications of measles may include pneumonia and encephalitis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

59. Chickenpox and measles are both acquired by the respiratory route.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

60. The MMR vaccine is used to protect against measles, mumps, and rubella.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

61. Diseases caused by fungi are called mycoses.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.09

Section: 22.04

Topic: Skin and Eye Infections

62. The skin-invading molds are collectively called dermatophytes.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 22.09

Section: 22.04

Topic: Skin and Eye Infections

Multiple Choice Questions

63.

Who would have larger numbers of bacteria living on the surface of their skin, a person living in the tropics or in the desert, and why?

A. The tropics would provide more shade, so the surface of the skin wouldn't be exposed to high levels of ultraviolet radiation. This would protect the bacteria on the skin, and they would have higher numbers due to this shading effect.

B. The very low humidity of the desert would lead to rapid evaporation of sweat and sebum from an individual's skin. Bacteria need these secretions for a nutrient source. Without them, bacteria would be found in much lower numbers on the skin of a person in the desert than the skin of the person in the tropics.

C. The constant secretion (and lack of evaporation) of high amounts of sweat would produce a highly salty environment on the skin of a person in the tropics. This would provide a local environment that would be too hostile for microbes to survive, so the number of microbes on the skin of the person in the tropics would be lower than that of the person in the desert.

D. The constant secretion of large amounts of sweat would wash bacteria off of the skin of the person in the tropics. As such, the person in the desert should have much more bacteria on their skin than the person in the tropics would.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.02

Section: 22.01

Topic: Skin and Eye Infections

64. The existence of extensive scalded skin syndrome does not indicate that *Staphylococcus* is growing in all the affected areas. Why not?

A. This condition is caused by an exotoxin produced by certain strains of this microbe, and NOT directly by the microbe itself.

B. This condition is caused by an endotoxin produced by certain strains of this microbe, and NOT directly by the microbe itself.

C. This condition isn't caused by *Staphylococcus* at all.

D. This microbe doesn't grow in the skin-but the toxins it releases are transported by the blood vessels into the skin, where it achieves the observed effect.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.04

Section: 22.02

Topic: Skin and Eye Infections

65. Why is it a good idea to immunize little boys against rubella?

A. As this is a sexually-transmitted disease, vaccinating girls AND boys early in their lives prevents the spread of the disease in adulthood.

B. We want to achieve herd immunity, and there's no reason why only girls would be infected by this virus. By vaccinating the entire population, we achieve a higher degree of herd immunity than is possible by vaccinating only girls.

C. Only boys get this disease, and one of the common complications is sterility.

D. While this disease is quite strikingly symptomatic in girls, it is completely asymptomatic in boys. Boys can be carriers and transmit it easily to girls they are in close proximity to without realizing it through respiratory secretions. This can lead to large-scale and dangerous outbreaks in the female population.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

66. What is the epidemiological significance of shingles?

- A. It shows that, as a latent viral infection, there is always a possible reservoir available to reinfect new susceptible individuals.
- B. It shows that we must always be vigilant against this deadly and highly infectious secondary infection in elderly and immunocompromised individuals.
- C. It shows that, as a chronic viral infection, individuals infected are always infectious to others around them, even when they do not show outward symptoms.
- D.

It shows that our fight for long-term eradication of varicella zoster virus will be a very long fight, depending on immunizing all newly born individuals until all the people who had ever had contracted the illness have died

E.

It shows that, as a latent viral infection, there is always a possible reservoir available to reinfect new susceptible individuals AND it shows that our fight for long-term eradication of varicella zoster virus will be a very long fight, depending on immunizing all newly born individuals until all the people who had ever contracted the illness have died.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

67. A public health official was asked to speak about immunizations during a civic group luncheon. One parent asked if rubella was still a problem. In answering the question, the official cautioned women planning to have another child to have their present children immunized against rubella. Why did the official make this statement to the group?

- A. Rubella is spread very easily by respiratory secretions and is largely asymptomatic. However, it can cause birth defects/stillbirth in pregnant women. Women with other children would want to prevent these children from acquiring the virus before attempting to conceive a new child in order to protect the fetus.
- B. Rubella is passed very easily between children, so the official was trying to protect the child that would soon be born from this infection that might be brought in by its siblings after it was born.
- C. The official is getting kickbacks and bribes from the companies making the vaccines, and he's trying to pad his pockets by getting as many people immunized as possible, regardless of whether they need it or not.
- D. Rubella infections often lead to very serious and potentially fatal complications. While a woman is pregnant, she may not be able to take care of a sick child as easily. The vaccine will prevent the child already in the family from falling ill and potentially dying due to these possible complications.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.06

Section: 22.03

Topic: Skin and Eye Infections

68.

When Lyme disease was first being investigated, the observation that frequently only one person in a household was infected was a clue leading to the discovery that the disease was spread by arthropod bites. Why was this so?

- A. Mosquitoes (an example of arthropods) are never inside a house. They are strictly outdoor animals, so they couldn't spread the infection inside the household.
- B. Mosquitoes (an example of arthropods) only bite once in their life cycle. As such, they can only transmit the illness once before they die. Even if an infected mosquito was inside a house, it could therefore only infect one human.
- C.** If the infection is spread by the bite of an arthropod, it wouldn't spread easily by respiratory secretions, direct contact, or sexual contact between individuals within the family.
- D. Arthropods lose their mechanical ability to bite a human after a single bite, much like certain bees that lose their stinger after a single sting. This prevents them from transmitting the infection to more than one individual in a household.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 22.05

Section: 22.02

Topic: Skin and Eye Infections

Chapter 23 Wound Infections

Multiple Choice Questions

1. The normal habitat of *Clostridium tetani* is

- A. humans.
- B. animals.
- C. plants.
- D.** soil and dust.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

2. The researcher who did much of the early work on *Clostridium tetani* was

- A. von Behring.
- B. Koch.
- C. Pasteur.
- D.** Kitasato.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

3. Wound healing can be slowed by the presence of

A.

normal microbiota.

B. antiseptic ointments.

C. sweat.

D. foreign matter.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

4. Wound infections may result in

A. delayed healing.

B. abscess formation.

C. extension of bacteria or their products into surrounding tissues or bloodstream.

D. aerobic conditions.

E. delayed healing, abscess formation AND extension of bacteria or their products into surrounding tissues or bloodstream.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

Chapter 23 - Wound Infections

5. A wound created by the drag of a knife across skin can be classified as

- A. puncture.
- B. incised.**
- C. lacerated.
- D. contused.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

6. The nodular, red, translucent surface material of a healing wound is called

- A. soluble skin.
- B. irritated scab.
- C. granulation tissue.**
- D. abscess.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

7. A localized collection of pus in a wound is termed a(n)

- A. leukocyte.
- B. dead tissue.
- C. granulation mound.
- D. abscess.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

8. Factor(s) not found in abscesses is/are

- A. pus.
- B. dead leukocytes.
- C. tissue remnants.
- D.** blood vessels.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

9. Microorganisms in abscesses often are not killed by antimicrobial agents because

- A. the microorganisms stop dividing.
- B. of the chemical nature of the pus.
- C. of the lack of blood vessels.
- D. of the high level of oxygenation.
- E.** the microorganisms stop dividing, of the chemical nature of the pus AND of the lack of blood vessels.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

10. An important feature of many wounds that may lead to more serious problems is that they are

- A. well aerated.
- B. well fed.
- C. sterile.
- D.** relatively anaerobic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

11. The most frequent genus causing wound infections in healthy people is

- A. *Pseudomonas*.
- B. *Staphylococcus*.**
- C. *Pasteurella*.
- D. *Rochalimea*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

12. Which of the following are involved in coating *Staphylococcus* with host proteins?

- A. clumping factor
- B. coagulase
- C. protein A
- D. leukocidin
- E. clumping factor, coagulase AND protein A**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

13. Formation of biofilms attached to fibronectin and fibrinogen coating plastic devices like catheters and heart valves is a virulence mechanism of

A.

Staphylococcus.

B.

Streptococcus.

C.

Clostridium.

D.

Pseudomonas.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.04

Section: 23.02

Topic: Infection and Disease

14. Which of the following has been associated with the flesh-eating organism?

A. *H. lechter*

B. *Pseudomonas aeruginosa*

C. *Staphylococcus aureus*

D. *Streptococcus pyogenes*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

Chapter 23 - Wound Infections

15. *S. pyogenes* associated with invasive disease characteristically have

A. leukocidins.

B. coagulase.

C.

streptococcal pyrogenic exotoxin A.

D.

streptococcal pyrogenic exotoxin B.

E.

streptococcal pyrogenic exotoxins A AND B.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

16. Which of the following produces a greenish pigment that may appear in infected wounds?

A. *E. coli*

B. *S. aureus*

C. *S. pyogenes*

D. *P. aeruginosa*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

17. Which of the following virulence factors has been associated with *Pseudomonas aeruginosa*?

A.

Endotoxin A

B.

Exoenzyme S

C.

Pyogenic exotoxin

D.

Endoenzyme T

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

18. The Gram-negative opportunistic rod that can grow in a wide variety of environments, including disinfectants and soaps, is

A. *E. coli*.

B. *S. aureus*.

C. *S. pyogenes*.

D. *P. aeruginosa*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.03

Section: 23.02

Topic: Immunity and Immunization

19. A striking feature of *Clostridium tetani* that differentiates it from other pathogenic species of *Clostridium* is its ability to

- A. produce a greenish pigment.
- B. form spores.
- C. form terminally located, spherical spores.**
- D. grow aerobically.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

20. The popular name for tetanus is

- A. hydrophobia.
- B. lockjaw.**
- C. whooping cough.
- D. consumption.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

21. The exotoxin produced by *C. tetani* is

- A. tetanoxin.
- B. exotetanus.
- C. tetanospasmin.**
- D. endospasmin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

22. The disease that involves the muscles and often manifests itself first with spasms of the jaw muscles is

- A. polio.
- B. rabies.
- C. tetanus.**
- D. gastritis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

23. Tetanus prevents the release of neurotransmitters from

- A. muscle cells.
- B. excitatory neurons.
- C. inhibitory neurons.**
- D. tetano cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

24. Tetanus vaccine contains

- A. inactivated bacteria.
- B. inactivated spores.
- C. live bacteria.
- D. inactivated tetanospasmin.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

25. Tetanus antitoxin is

- A. antibody against the bacteria.
- B. inactivated toxin.
- C. inactivated bacteria.
- D.** antibody against the toxin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

26. The toxin implicated in *C. perfringens* toxicity is

- A. tetanospasmin.
- B. exoenzyme S.
- C.** alpha-toxin.
- D. endoenzyme T.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

27. Gas gangrene is so named due to the formation of

- A. carbon dioxide.
- B. oxygen.
- C. hydrogen.
- D. carbon monoxide.
- E.** carbon dioxide AND hydrogen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

28. Effective treatment of gas gangrene primarily involves

- A. use of an antitoxin.
- B. use of immune globulins.
- C. vaccination with inactivated toxin.
- D. surgical removal of dead and infected tissues.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

29. The organism that grows anaerobically in dead or damaged tissue and produces dense colonies that are the color and size of sulfur particles is

- A. *Escherichia coli*.
- B. *Staphylococcus aureus*.
- C. *Actinomyces israelii*.**
- D. *Pseudomonas aeruginosa*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

30. The disease most feared to develop after an animal bite is

- A. tetanus.
- B. rabies.**
- C. gas gangrene.
- D. actinomycosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

31. The most common infectious agent acquired from the bite wounds of a number of kinds of animals is

- A. *Escherichia coli*.
- B. *Pasteurella multocida*.**
- C. *Actinomyces israelii*.
- D. *Pseudomonas aeruginosa*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

32. The infectious agent(s) that may arise in a wound from a human bite is/are

- A. *Escherichia coli*.
- B. *Bacteroides*.
- C. *Actinomyces israelii*.
- D. *Staphylococcus aureus*.
- E. *Bacteroides* AND *Staphylococcus aureus*.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.07

Section: 23.04

Topic: Infection and Disease

33. The most common cause of chronic lymph node enlargement at a localized body site in young children is

- A. rat bite fever.
- B. dead bat fever.
- C. cat scratch fever.**
- D. mouse itch fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

34. Cat scratch fever is caused by

- A. *Bartonella (Rochalimaea) henselae*.
- B. *Pasteurella multocida*.
- C. *Teddis nugentaea*.
- D. *Staphylococcus aureus*.
- E. *Bartonella (Rochalimaea) henselae* AND *Staphylococcus aureus*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

35. Rat bite fever, characterized by fever, rash, and muscle aches, is caused by

- A. *Afipia felis*.
- B. *Bartonella (Rochalimaea) henselae*.
- C. *Pasteurella multocida*.
- D. *Streptobacillus moniliformis*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

36. *Streptobacillus moniliformis* is unusual in that it

- A. forms spores.
- B. spontaneously forms L-forms.
- C. is anaerobic.
- D. has a cell wall.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

Chapter 23 - Wound Infections

37. Which of the following has not been associated with human bites?

A.

Syphilis

B.

Tuberculosis

C.

Hepatitis B

D.

Tetanus

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.07

Section: 23.04

Topic: Infection and Disease

Chapter 23 - Wound Infections

38.

Which of the following has been involved in causing small epidemics in the United States?

A.

Tinea

B.

Candidiasis

C.

Trichomoniasis

D.

Sporotrichosis

Bloom's Level: 1. Remember

Learning Outcome: 23.09

Section: 23.05

Topic: Infection and Disease

39. The fungal disease that may be associated with sphagnum moss is

A. candidiasis.

B. actinomycosis.

C. cat scratch fever.

D. sporotrichosis.

Bloom's Level: 1. Remember

Learning Outcome: 23.09

Section: 23.05

Topic: Infection and Disease

40. Frequently sporotrichosis is caused when the infectious agent is introduced into the body by

- A. lotions.
- B. scissors.
- C. thorns.**
- D. animal bites.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.09

Section: 23.05

Topic: Infection and Disease

41. Which is true about protein A?

- A. It binds to the Fc region of antibody.
- B. It hides bacteria from phagocytes.
- C. It enhances binding of phagocytes.
- D. It digests antibodies.
- E. It binds to the Fc region of antibody AND it hides bacteria from phagocytes.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

42. Which is true of leukocidins?

- A. They are superantigens.
- B. They kill neutrophils.**
- C. They make holes in host cell membranes.
- D. They bind to Fc regions of antibodies.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.07

Section: 23.04

Topic: Infection and Disease

43. Both *Staphylococcus aureus* and *Streptococcus pyogenes*

- A. are rod-shaped.
- B. have fibronectin binding proteins.**
- C. cause necrotizing fasciitis.
- D. have exotoxin A.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.04

Section: 23.02

Topic: Infection and Disease

44. Early work with *Clostridium tetani* and *Corynebacterium diphtheriae* demonstrated

- A. the importance of thoroughly cooking food.
- B. the usefulness of vaccines.**
- C. the potential threat from spore-forming bacteria.
- D. that disease can be caused by poisonous substances produced by bacteria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.01

Section: 23.01

Topic: Infection and Disease

True / False Questions

45. An abscess is a collection of pus.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 23.02

Learning Outcome: 23.05

Section: 23.01

Topic: Infection and Disease

Chapter 23 - Wound Infections

46.

Clumping factor, coagulase, and protein A serve to coat *Staphylococcus* with host proteins.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

47. Staphylococci are the leading cause of wound infections.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.04

Section: 23.02

Topic: Infection and Disease

48.

All staphylococci are coagulase positive.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

49. Both *Staphylococcus aureus* and *Streptococcus pyogenes* have fibronectin-binding proteins.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 23.04

Section: 23.02

Topic: Infection and Disease

50. Individuals who have recovered from tetanus are not immune to the disease and must be immunized.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

51. "Flesh-eating" *Streptococcus pyogenes* is considered a newly emerging disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

52. Tetanus antitoxin can cross the placenta.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

53. Actinomycosis is a fungal disease.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

54. *Streptobacillus moniliformis* is unusual in that it spontaneously forms L-forms.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.08

Section: 23.04

Topic: Infection and Disease

55. Bites by little children typically cause few problems.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 23.07

Section: 23.04

Topic: Infection and Disease

Multiple Choice Questions

56. What is NOT a reason why an abscessed wound might not respond to antibiotic treatment?
- A. The bacteria within the abscess have ceased replicating, and many antibiotics require actively replicating cells in order to be effective.
 - B. The blood vessels that would bring the drug to the area have been destroyed or clogged with clots, preventing the drug from getting to the microbes in the abscess.
 - C.** The bacteria in an abscess have all acquired multi-drug antibiotic resistance, so any drugs that are used will have no effect.
 - D. The chemical composition of the pus in the abscess often inactivates antibiotic drugs, making them ineffective.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 23.02

Section: 23.01

Topic: Infection and Disease

57. Why is it not surprising that *Staphylococci* are the leading cause of wound infections?

A.

This genus is readily present as a part of the normal microbiota on most people's skin, so it could easily enter wounds.

- B. Members of this genus are all particularly virulent and highly capable of causing numerous infections.
- C. *Staphylococci* cannot be eradicated from the skin due to multidrug resistance in most members of the genus. Drugs simply don't kill them.
- D. *Staphylococci* are capable of a higher degree of spontaneous mutation than most microbes. This makes them able to acquire antibiotic resistance very readily, making them hard to eliminate by pre-surgical antibacterial scrubs. As such, they commonly infect surgical wound sites.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 23.03

Section: 23.02

Topic: Infection and Disease

58. Would babies need to be immunized against lockjaw (tetanus) if their mother had been immunized against the disease? Why or why not?

A. No-because the mother's IgG antibodies would be passed along through the placenta before birth, protecting the baby from the infection.

B. Yes-because even though maternal IgG antibodies might be passed along through the placenta, they will not last forever. The baby will need to create its own antibody response to be protected against future tetanus.

C. No-because maternal IgG antibodies would be passed along in the breast milk, protecting the baby from infection.

D.

Yes-because the maternal response to the tetanus vaccine is to produce IgE antibodies, and IgD antibodies are the predominant type in breast milk. And what if the baby isn't breast-fed? Therefore, even if the baby is breast-fed, it won't receive the mother's protective antibodies.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 23.06

Section: 23.03

Topic: Infection and Disease

59. Why might *Candida albicans* become pathogenic in an individual receiving antibacterial medications?

A. This fungal organism can actually utilize the destroyed bacterial cells as a nutrient source and begin to multiply out of control. This can cause a pathogenic state.

B.

This is an opportunistic pathogen not normally found in normal microbiota. As such, when the bacterial normal microbiota is wiped out by broad-spectrum antibacterial drugs, this opportunist can adhere to and colonize the area left behind.

C.

This is a usual member of the normal microbiota. However, when the bacterial members of the normal microbiota are wiped out by a broad-spectrum antibacterial drug, this fungal cell type has little to no competition for resources in the affected area. As such, it quickly overgrows and can cause a pathogenic state.

D.

This is a protozoan species and part of the normal microbiota. When the bacterial members of the normal microbiota are wiped out by a broad-spectrum antibacterial drug, this protozoan cell type has little to no competition for resources in the affected area. As such, it quickly overgrows and can cause a pathogenic state.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 23.09

Section: 23.05

Topic: Infection and Disease

60. Rowley Pharmaceutical company produces a drug that promotes new blood vessel growth. Is there any application for this drug in wound treatment?

A. It could be very beneficial-one of the biggest problems with wound infections is their largely anaerobic nature. The blood supply to the area is usually compromised, helping to create the anaerobic environment. Certain pathogenic microbes then thrive in this environment, creating very serious wound infections.

B. It could be disastrous! Part of the reason abscesses lack blood flow is to keep toxins and bacteria from spreading to other areas of the body. Increasing blood flow to the area will provide a highway for these bacteria to seed other organ systems!

C. It could be dangerous-wounds need to cut off blood supply to prevent the patient from bleeding to death. Increasing blood vessel development in the wound site might cause the patient to bleed out.

D. There would be no beneficial effect-the immune response is already in place in the wound site, so increasing blood cell delivery to the area wouldn't increase or decrease the rate of wound healing.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 23.05

Section: 23.03

Topic: Infection and Disease

Chapter 24 Digestive System Infections

Multiple Choice Questions

1. Who determined that the cholera outbreak in 1850s London was due to contaminated water and approached the problem by removing the pump handle at the contaminated site?

- A. Pasteur
- B. Snow**
- C. Koch
- D. Smith

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.01

Section: 24.01

Topic: History of Microbiology

2. The passage from the mouth to the anus is termed the

- A. gut canal.
- B. oral cavity.
- C. grand canal.
- D.**

gastrointestinal tract.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 24.01

Section: 24.01

Topic: Digestive System Infections

3. Collections of bacteria that adhere to the surfaces of the teeth are called

- A. dental caries.
- B. dental plaque.**
- C. halitosis.
- D. periodontal disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.01

Section: 24.01

Topic: Digestive System Infections

4. The most common infectious disease of humans is

- A. the common cold.
- B. dental caries.**
- C. hepatitis A.
- D. halitosis

Bloom's Level: 1. Remember

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

5. The principal cause of dental caries is

- A. *S. mutans*.**
- B. *S. salivarius*.
- C. *S. mitis*.
- D. *S. sanguis*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

6. Part of the ability of *S. mutans* to produce dental caries depends on its ability to
- A. invade plaque and dissolve the gums.
 - B. convert sucrose to lactic acid.**
 - C. convert proteins to sugars.
 - D. attach to the gums.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

7.

This chemical compound, typically added to drinking water, makes enamel more resistant to dissolving in acid.

A.

Calcium

B.

Chlorine

C.

Chloramine

D.

Fluoride

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

8. The chronic inflammatory process involving the gums and tissues around the teeth is called

- A. dental caries.
- B. periodontal disease.**
- C. dental plaque.
- D. root caries.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

9.

Helicobacter pylori is, in part, able to survive in the stomach by its ability to produce

- A. lactic acid from sugar.
- B. fatty acids from sebum.
- C. neutralizing proteins from glucans.
- D. ammonia from urea.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.05

Section: 24.02

Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

10.

Helicobacter pylori appears to have some connection with

- A. acid reflux disease.
- B. ulcers.
- C. dental caries.
- D. stomach cancer.
- E.** ulcers AND stomach cancer.

Bloom's Level: 2. Understand
Learning Outcome: 24.05
Section: 24.02
Topic: Digestive System Infections

11.

Where in the body does the latent, non infectious, non replicating form of the herpes simplex virus persist?

- A.
Motor neurons
- B.
Red blood cells
- C.
Cranial nerves
- D.**
Sensory nerves

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.
ASM Topic: Module 05 Systems
Bloom's Level: 1. Remember
Learning Outcome: 24.06
Section: 24.03
Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

12. A painful finger infection attributable to herpes virus is known as a(n)

- A. finger sore.
- B. abrasion lesion.
- C. furuncle.
- D.** herpetic whitlow.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

13. Which of the following has shown some effectiveness in treating a herpes infection?

- A. AZT
- B.

Protease inhibitors

C.

Acyclovir

D.

Cephalosporin

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

14. The viral disease that characteristically infects the parotid glands is
- A. measles.
 - B. herpes.
 - C. chickenpox.
 - D.** mumps.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

15. Mumps is a good candidate for elimination from the population due to
- A. the existence of an effective vaccine.
 - B.

a human-only reservoir.

- C. the absence of a latent state.
- D. a single serotype.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

16.

Most bacterial intestinal infections may be traced to

- A. *Vibrio* spp.
- B. *C. jejuni*.
- C. *Salmonella* spp.
- D.

Enterobacteriaceae.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.07

Section: 24.04

Topic: Digestive System Infections

17. The initial attachment required for establishment of an intestinal infection is by

- A. flagella.
- B. cilia.
- C. pseudopodia.
- D.** pili.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.07

Section: 24.04

Topic: Digestive System Infections

18. The toxins involved in intestinal infections typically

- A. kill cells by inhibiting protein synthesis.
- B. modify cell physiology resulting in increased secretion of water and electrolytes.
- C. modify cell physiology resulting in decreased secretion of water and electrolytes.
- D. kill cells by inhibiting DNA synthesis.
- E. kill cells by inhibiting protein synthesis AND modify cell physiology resulting in increased secretion of water and electrolytes.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.07

Section: 24.04

Topic: Digestive System Infections

19. Cholera is the classic example of a(n)

A.

food borne illness.

B. zoonosis.

C. opportunist.

D. very severe form of diarrhea.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

20. The diarrhea of cholera has been described as

- A. a viscous fluid.
- B. small in volume.
- C. somewhat watery.
- D.** a rice water stool.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

21. The symptoms of cholera are due to the action of

- A. an endotoxin.
- B. modified mucus.
- C. flagella.
- D.** an exotoxin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

22. A common source of cholera infection is

- A. acid rain.
- B. unpasteurized milk.
- C.** fecal contaminated material, especially water.
- D. boiled water.
- E. acid rain AND boiled water.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

23. The primary treatment for cholera is
- A. the administration of antibiotics.
 - B. vaccination.
 - C. by blood transfusion.
 - D. simply rehydration.**
 - E. vaccination AND by blood transfusion.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

24. *Shigella* and cholera toxin both
- A. have an A-B arrangement.**
 - B. work through ADP ribosylation.
 - C. increase cAMP levels.
 - D. prevent protein synthesis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

25. *Shigella*
- A. are themselves nonmotile.
 - B. may be pushed from cell to cell by actin tails.
 - C. utilize pili to move.
 - D. utilize flagella to move.
 - E. are themselves nonmotile AND may be pushed from cell to cell by actin tails.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

26. Which of the following groups contain diarrhea-causing *E. coli*?

- A. enterotoxigenic
- B. enteroinvasive
- C. enteropathogenic
- D. enterohemorrhagic
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

27. Which of the following groups give rise to a disease similar to that caused by *Shigella* sp.?

- A. enterotoxigenic
- B.** enteroinvasive
- C. enteropathogenic
- D. enterohemorrhagic
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

28. Which group produces a toxin somewhat similar to that produced by *Shigella dysenteriae*?

- A. enterotoxigenic
- B. enteroinvasive
- C. enteropathogenic
- D. enterohemorrhagic**
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

29.

Vibrio cholerae and most salmonellae are

- A. killed by acid conditions.**
- B. stimulated by acid conditions.
- C. killed by low concentrations of salt.
- D. killed by neutral conditions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

30. Most cases of *Salmonella* gastroenteritis have a(n)

- A. water source.
- B. human source.
- C. plant source.
- D.** animal source.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

31. The food products most commonly contaminated with *Salmonella* strains are

- A. meat and seafood.
- B. milk and cheese.
- C. fruit and vegetables.
- D.** eggs and poultry.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

32. The animal(s) often associated with *Salmonella* strains is/are

- A. turtles.
- B. iguanas.
- C. baby chickens.
- D. ducks.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

33. In which of these organs does a carrier of typhoid bacilli maintain the bacteria?

- A. liver
- B. gallbladder**
- C. Peyer's patches
- D. colon
- E. liver AND Peyer's patches

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

34. The most notorious typhoid carrier was

- A. Typhoid Tilly.
- B. Typhoid Tom.
- C. Typhoid Mary.**
- D. Typhoid Mark.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: History of Microbiology

35. Which of these bacteria require a special medium and microaerophilic conditions?

A.

Escherichia coli

B.

Pseudomonas aeruginosa

C.

Staphylococcus aureus

D.

Campylobacter jejuni

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

36.

A mysterious sequel to *Campylobacter jejuni* infections is

A. Reye's syndrome.

B. Tourette's syndrome.

C. Pasteur's syndrome.

D. Guillain-Barré syndrome.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

37.

The animal(s) most often associated with *Campylobacter jejuni* is/are

- A. turtles.
- B. iguanas.
- C. chickens.**
- D. ducks.
- E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

38. Viral gastroenteritis in infants and children is most commonly caused by

- A. herpes.
- B. hepatitis B.
- C.

Norovirus.

D. rotavirus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.09

Section: 24.05

Topic: Digestive System Infections

39. Viral gastroenteritis that affects people of all ages and usually lasts less than 3 days is caused by

- A. herpes.
- B. hepatitis B.
- C. norovirus.**
- D. rotavirus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.09

Section: 24.05

Topic: Digestive System Infections

40. The most common chronic blood-borne infection in the U.S. is

- A. hepatitis A
- B. hepatitis B
- C. hepatitis C**
- D. hepatitis D

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.10

Section: 24.06

Topic: Digestive System Infections

41. Hepatitis A spreads via

- A. the respiratory route.
- B. blood transfusion.
- C. body fluids.
- D. the fecal-oral route.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.10

Section: 24.06

Topic: Digestive System Infections

42. HBV is mainly spread by

- A. blood.
- B. blood products.
- C. semen.
- D. saliva.
- E.** blood, blood products AND semen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.10

Section: 24.06

Topic: Digestive System Infections

43. Intestinal protozoan infections are typically spread by

- A. the respiratory route.
- B. blood transfusion.
- C. body fluids.
- D.** the fecal-oral route.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

44. The most commonly identified waterborne illness in the United States is

- A. amoebiasis.
- B. cryptosporidiosis.
- C. balantidiasis.
- D.** giardiasis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

45. Giardiasis may be contracted from

- A. another person.
- B. clear mountain streams.
- C. chlorinated city water.
- D. cold filtered beer.
- E. another person, clear mountain streams AND chlorinated city water.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

46.

may infect

- A. dogs.
- B. pigs.
- C. cattle.
- D. humans.
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

47. Most North American outbreaks of *Cyclospora cayetanensis* have been associated with

A. cattle.

B. iguanas.

C.

imported leafy vegetables and berries.

D. chickens.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

48. The oocytes of *Cyclospora cayetanensis*

A. are mature when eliminated in the stool.

B. do not contain sporozoites when passed in the feces.

C. are smaller than the oocytes of *Cryptosporidium parvum*.

D. give rise to three sporozoites.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

49. *Entamoeba histolytica*

- A. causes amebiasis.
- B. may form cysts.
- C. cysts survive passage through the stomach.
- D. may produce a cytotoxic enzyme.
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

50. Amebiasis

A.

is caused by .

- B. often causes a bloody diarrhea.**
- C. is an infection of the stomach.
- D. is restricted to temperate climates.
- E.

is caused by AND often causes a bloody diarrhea.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

True / False Questions

51. The bacteria primarily responsible for dental caries is *Streptococcus mutans*.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

52. Sucrose is one of the major contributors to the development of dental caries.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

53.

Helicobacter pylori appears connected to stomach cancer and ulcers.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.05

Section: 24.02

Topic: Digestive System Infections

54. The saliva of asymptomatic carriers of herpes simplex is commonly infectious.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

55. The mumps virus initially infects the respiratory tract.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.06

Section: 24.03

Topic: Digestive System Infections

56.

Virulent strains of *Shigella* typically carry an R plasmid.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

Chapter 24 - Digestive System Infections

57.

The infectious dose for cholera is much larger than that for shigellosis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

58. *Cyclospora cayetanensis* has, so far, not been identified with an animal source.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

59. Cyclosporiasis is transmissible from person to person.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

60.

Both *Giardia lamblia* and *parvum* are resistant to chlorine.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

Multiple Choice Questions

61. Why is it that the tongue and cheek epithelium doesn't provide a sufficient anaerobic environment for plaque anaerobes to grow, but the surface of teeth might?

- A.** The epithelium is supplied with oxygen by capillary beds. This makes it a relatively aerobic environment and hostile to anaerobes.
- B. The tooth enamel is supplied with oxygen by capillary beds. This makes it a relatively anaerobic environment and hostile to aerobes.
- C. The surface of the tongue and cheek are constantly scraped by the action of consuming food. Layers of bacterial growth that might help to supply an anaerobic environment are scraped away, exposing lower levels to oxygen-rich air.
- D. The surface of teeth (especially the molars) have many pits and crevices that can serve as 'pockets' for layers of bacteria to grow in. Once the layers get deep enough, the bottom portions are anaerobic. This isn't possible on the very smooth surface of the tongue and cheek epithelium.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 24.04

Section: 24.02

Topic: Digestive System Infections

62. Explain how *Vibrio cholerae* causes cholera without apparent damage to the intestinal epithelium.

A. This microbe causes destruction of the cellular structures underneath the intestinal epithelium-this is what induces the watery rice-stool characteristic of the illness. This leaves the overlying intestinal epithelium intact.

B. This microbe directly invades the intestinal epithelial cells, but does not kill them. Instead, while multiplying inside them, it causes them to secrete large amounts of chloride ions. This induces water to follow by osmosis, resulting in the watery rice-stool characteristic of the illness.

C. This microbe attaches to the surface of intestinal epithelial cells, secreting an exotoxin that causes the epithelium to secrete large amounts of chloride ions. This induces large amounts of water to follow by osmosis, resulting in the watery rice-stool characteristic of the illness.

D. The inflammatory reaction to the presence of this microbe causes the watery rice-stool characteristic of the illness. Therefore, it's technically the immune response that initiates the disease, although this response is induced by the presence of the microbe on the intestinal epithelium.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 24.08

Section: 24.04

Topic: Digestive System Infections

63. Why might it be more difficult to prepare a vaccine against noroviruses than against rotaviruses?

A. We haven't been able to culture noroviruses in a lab setting yet. Without a starting culture, we can't create a vaccine.

B. Noroviruses are RNA viruses, where rotaviruses are DNA viruses. RNA viruses mutate far more easily than DNA viruses, so we COULD make a vaccine, but it would be rendered useless fairly quickly as the virus mutates.

C. We lack a proper culturing method for large-scale production of target cells for norovirus, whereas we have such a system for the target cells of rotaviruses. Without a system to get large numbers of target cells, we can't produce a vaccine.

D. Norovirus is much more infectious than rotavirus. As such, it's much harder to work with safety. This makes production of a vaccine too dangerous and unpredictable.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 24.09

Section: 24.05

Topic: Digestive System Infections

64. Would you expect an individual with giardiasis who has diarrhea to be more likely to transmit the disease than an individual with giardiasis who does NOT have diarrhea? Why or why not?

A. No. This illness is spread by respiratory droplets, so diarrhea as a symptom shouldn't matter for transmission of the disease.

B. No. This illness is spread by sexual contact, so diarrhea as a symptom shouldn't matter for transmission of the disease.

C. Yes. This illness is spread by the fecal-oral route, so presence of diarrhea as a symptom should dramatically increase the possibility of transmission of infection.

D. Yes. This illness is spread by insects that feed on contaminated fecal matter, becoming infected themselves. The disease is spread to new individuals when these infected insects bite a susceptible person, transmitting the cysts of the protozoan. As such, diarrhea as a symptom would increase the risk of transmission through biting insects to new individuals.

E. No. This illness is spread when people ingest cysts, and a person with severe diarrhea excretes primarily trophozoites; an asymptomatic person is more likely to excrete cysts and is therefore more infectious.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 24.11

Section: 24.07

Topic: Digestive System Infections

Chapter 25 Blood and Lymphatic Tract Infections

Multiple Choice Questions

1. The scientist responsible for the development of the first anti-plague vaccine in 1866 was
A. Alexandre Yersin.
B. Robert Koch.
C. Louis Pasteur.
D. Josef Marburg.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: History of Microbiology

2. The plague bacillus is known as
A. *Plasmodium vivax*.
B. *Pneumocystis carinii*.
C. *Streptococcus pyogenes*.
D. Yersinia pestis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

3. The circulation of an agent in the bloodstream is given a name ending in

- A. -ase.
- B. -ing.
- C. -emia.**
- D. -ation.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

4. The sac which surrounds the heart is called the

- A. endocardium.
- B. pericardium.**
- C. atrium.
- D. myocardium.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

5. The heart chamber that passes blood to the lungs is the

- A. left ventricle.
- B. right ventricle.**
- C. right atrium.
- D. left atrium.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

6. Which organism may be implicated in arteriosclerosis?

- A. *Escherichia coli*
- B. *Pseudomonas aeruginosa*
- C. *Staphylococcus aureus*
- D. *Chlamydia pneumoniae***

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

7. The fluid which bathes and nourishes the tissue cells is the

- A. cytoplasm.
- B. lymph.
- C. blood.
- D. interstitial fluid.**

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

8. The small bean-shaped bodies into which the lymphatic vessels drain are the

- A. lymph nodes.**
- B. adrenals.
- C. subclavian veins.
- D. valves.

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

9. A visible red streak in an infected hand or foot is referred to as

- A. septicemia.
- B. bacteremia.
- C. lymphangitis.**
- D. edema.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

10. Blood and lymph may carry

- A. antibodies.
- B. complement.
- C. lysozyme.
- D. interferon.
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

11. The spleen, in part, functions to cleanse the

- A. lymph.
- B. interstitial fluid.
- C. cytoplasm.
- D. blood.**

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

12. The condition that develops on a previously damaged heart valve is called

- A. an aneurysm.
- B. acute bacterial endocarditis.
- C. myocarditis.
- D.** subacute bacterial endocarditis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

13. The most common agent(s) causing subacute bacterial endocarditis is/are

- A. *Streptococcus pyogenes*.
- B. *Pseudomonas aeruginosa*.
- C.**

normal skin or mouth microbiota.

D. *Escherichia coli*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

Chapter 25 – Blood and Lymphatic Infections

14.

High levels of antibodies in patients with SBE cause inflammation because

A.

they make the bacteria clump together and get trapped in skin and eyes.

B. the surface antigens change rapidly and become unrecognizable.

C. the antibodies are defective.

D. the antibodies degrade quickly.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

15. The inflammatory effects of immune complexes lodged in the kidney is called

A. renal phritis.

B. rendema.

C. glomerulonephritis.

D. urethritis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

16. Bacteria which cause subacute bacterial endocarditis may gain access to the bloodstream by
- A. trauma.
 - B. dental procedures.
 - C. brushing teeth.
 - D. ingestion.
 - E. trauma, dental procedures AND brushing teeth.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

17. Acute bacterial endocarditis differs from subacute bacterial endocarditis in the
- A. suddenness and severity of onset.**
 - B. population affected.
 - C. resultant damage.
 - D. development of exotoxin shock.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.02

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

18. Which of the following is more likely to cause fatal septicemias?
- A. Gram-positive bacteria
 - B. Gram-negative bacteria**
 - C. negative stained bacteria
 - D. acid-fast stained bacteria

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

19. The material released from bacteria that may lead to shock and death in septicemia is
- A. exotoxin.
 - B. protein A.
 - C. endotoxin.**
 - D. interferon.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

20. The cytokine released from macrophages that seems to play a major role in endotoxic shock is
- A. macrophage factor.
 - B. tumor necrosis factor.**
 - C. protein A.
 - D. interferon.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

21. Although endotoxemia affects many organs, the organ most seriously and irreversibly affected is the
- A. heart.
 - B. lung.**
 - C. kidney.
 - D. spleen.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

22. Enlargement of lymph nodes or spleen is often associated with

- A. tularemia.
- B. brucellosis.
- C. plague.
- D. gastritis.
- E. tularemia, brucellosis AND plague.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

23. In order to culture the organism responsible for tularemia, the growth media must contain

- A. charcoal.
- B. glucose.
- C. cysteine.**
- D. NAD.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

24. The common name for tularemia is

- A. Bang's disease.
- B. rabbit fever.**
- C. Hansen's disease.
- D. Chagas' disease.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

25. The development of lymph node enlargement in the region of a skin ulcer after a tick or insect bite or handling of a wild animal suggests

- A. brucellosis.
- B. endocarditis.
- C. septicemia.
- D.** tularemia.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

26. Which of the following is/are able to survive phagocytosis?

- A. *Brucella* sp.
- B. *Staphylococcus aureus*
- C. *Francisella tularensis*
- D.**

Brucella sp AND *Francisella tularensis*

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

Chapter 25 – Blood and Lymphatic Infections

27. Brucellosis may also be known as

A. Bang's disease.

B.

undulant fever.

C. Hansen's disease.

D. rabbit fever.

E.

Bang's disease AND undulant fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

28. Traditionally the animal(s) associated with hosting Brucella is/are

A. cattle.

B. dogs.

C. goats.

D. pigs.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

29. The "Black Death" may also be known as

- A. tularemia.
- B. brucellosis.
- C. endocarditis.
- D.** plague.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

30. The disease responsible for the death of approximately ¼ the population of Europe from 1346 to 1350 was

- A. typhus.
- B. pneumonia.
- C. influenza.
- D.** plague.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

31. Symptoms of plague appear in

- A. two to three months.
- B. one to two years.
- C. three to six hours.
- D.** one to six days.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

32. The causative agent of plague is

- A. *Vibrio cholerae*.
- B. *Staphylococcus aureus*.
- C. *Brucella abortus*.
- D.** *Yersinia pestis*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

33. *Yersinia pestis* typically contains

- A. one plasmid.
- B. two plasmids.
- C.** three plasmids.
- D. four plasmids.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

34. The major virulence factors of *Yersinia pestis* are carried on

- A. the chromosome.
- B. a plasmid.
- C.** three separate plasmids.
- D. nuclear membrane.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

35. The virulence factor of *Yersinia pestis* that is a protease that destroys C3b and C5a is

A. Yops.

B.

pla.

C. F1.

D. protein A.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

36. Yops proteins, produced by *Yersinia pestis*,

A. interfere with phagocytosis.

B. activates plasminogen activator.

C. destroys C3b and C5a.

D. promotes apoptosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

37. The plague is typically transmitted via the bite of

A. ticks.

B. fleas.

C. lice.

D. mites.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

38. Enlargement of lymph nodes or spleen is often associated with

- A. tularemia.
- B. brucellosis.
- C. plague.
- D. infectious mononucleosis.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.05

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

39. The cause of infectious mononucleosis is

- A. varicella virus.
- B. *Staphylococcus aureus*.
- C.** Epstein-Barr virus.
- D. *Francisella tularensis*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.05

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

40. Epstein-Barr virus may become latent in

- A. red blood cells.
- B. T cells.
- C. nerve cells.
- D.** B cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.05

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

41. The production of heterophile antibody is associated with

- A. tularemia.
- B. brucellosis.
- C. plague.
- D.** infectious mononucleosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.05

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

42. Which of the following may be transmitted by saliva?

- A.** infectious mononucleosis
- B.

Dengue fever

- C. plague
- D. yellow fever

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.05

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

43. Yellow fever is transmitted by

- A. ticks.
- B. fleas.
- C. *Anopheles* mosquitoes.
- D.** *Aedes* mosquitoes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 1. Remember

Learning Outcome: 25.05

Learning Outcome: 25.06

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

44. The disease caused by an enveloped single-stranded RNA arbovirus of the flavivirus family is

- A. AIDS.
- B. malaria.
- C. yellow fever.
- D. herpes.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.03

Learning Outcome: 25.06

Topic: Cardiovascular and Lymphatic Infections

45. Which of the following is caused by a protozoan infection?

- A. malaria
- B. yellow fever
- C. tularemia
- D. infectious mononucleosis

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.07

Section: 25.04

Topic: Cardiovascular and Lymphatic Infections

46. Which of the following is transmitted by mosquitoes?

- A. plague
- B. yellow fever
- C. malaria
- D. tularemia
- E. yellow fever AND malaria

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.07

Section: 25.04

Topic: Cardiovascular and Lymphatic Infections

47. Which species of *Plasmodium* causes the most serious form of malaria?

- A. *ovale*
- B. *malariae*
- C. *vivax*
- D. falciparum**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.08

Section: 25.05

Topic: Cardiovascular and Lymphatic Infections

48. In which of the following diseases does the spleen enlarge?

- A. infectious mononucleosis
- B. malaria
- C. leishmaniasis
- D. brucellosis
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

Bloom's Level: 2. Understand

Learning Outcome: 25.05

Learning Outcome: 25.08

Section: 25.05

Topic: Cardiovascular and Lymphatic Infections

True / False Questions

49. Muscles aid the flow of venous blood.

TRUE

ASM Objective: 07.03a Ability to communicate and collaborate with other disciplines: Effectively communicate fundamental concepts of microbiology, in written and oral format.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 25.01

Section: 25.01

Topic: Cardiovascular and Lymphatic Infections

50. Septicemia is only caused by Gram-negative bacteria.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

51.

Both *Francisella tularensis* and *Brucella melitensis* are able to survive phagocytosis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

52. Gram-positive organisms are more likely to cause fatal septicemias than other infectious agents.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

53. The media used to successfully grow *Francisella tularensis* must contain cysteine.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

54. The major virulence factors of *Yersinia pestis* are carried on a plasmid.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

55. Yellow fever is caused by a protozoan infection.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.06

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

56. Both malaria and yellow fever are transmitted by mosquitoes.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 25.07

Section: 25.04

Topic: Cardiovascular and Lymphatic Infections

57. *Plasmodium falciparum* causes the most serious form of malaria.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.08

Section: 25.04

Topic: Cardiovascular and Lymphatic Infections

58. In a malarial infection, only sporozoites can infect the human liver.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.07

Section: 25.04

Topic: Cardiovascular and Lymphatic Infections

Multiple Choice Questions

59. What is the difference between 'bacteremia' and 'septicemia'?

- A. Bacteremia is an infection with bacteria. Septicemia is an infection with *Septic* protozoans.
- B.** Bacteremia is the presence of living, multiplying bacteria in the bloodstream. Septicemia is the presence of endotoxins, but not necessarily of living microbial agents.
- C. Septicemia is the presence of living, multiplying bacteria in the bloodstream. Bacteremia is the presence of endotoxins, but not necessarily of living microbial agents.
- D. There is no difference-both terms denote the presence of living bacterial cells in the bloodstream.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 25.03

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

60. How would crowded conditions in cities favor spread of plague?

A. Plague is transmitted by rats-more people means more waste, and more waste means more rats. This would favor the spread of plague.

B. Plague is transmitted by mosquitoes-more people close together gives an infected mosquito more chances to bite humans and transmit the causative agent, spreading plague.

C. Plague is transmitted by infected fleas-these fleas may be found on rodents (such as rats). More people in an area means a greater chance of interactions with animals carrying infected fleas, increasing the spread of plague.

D. Plague is transmitted by direct contact (e.g. skin to skin). More people in an area provides more chances for infected individuals to directly contact and infect other individuals, spreading plague.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 25.04

Section: 25.02

Topic: Cardiovascular and Lymphatic Infections

61. Why does it take more than a week before a mosquito just infected with yellow fever virus can transmit the disease?

A. The virus must replicate in the gut of the mosquito before it can reach high enough numbers for transmission to a new human.

B. Mosquitoes only feed once a week, which limits their ability to transmit the disease rapidly.

C. Yellow fever is caused by a protozoan. It must develop from the sporozoite form into the mature form to become infectious, and this takes time.

D. The virus multiplies in the gut of the mosquito, but then needs to migrate to the proboscis (biting nose) of the animal in order to infect a new human being after a new bite. This migration takes time.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 25.06

Section: 25.03

Topic: Cardiovascular and Lymphatic Infections

Chapter 26 Nervous System Infections

Multiple Choice Questions

1. The central nervous system is made up of the
A. brain and spinal cord.
B. spinal cord and spinal nerves.
C. sympathetic and parasympathetic system.
D. brain and endocrine organs.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 26.02

Section: 26.01

Topic: Nervous System Infections

2.

The nerves that carry information to the central nervous system (CNS) are termed

- A. motor nerves.
B. endocrine nerves.
C. sensory nerves.
D. cerebrospinal nerves.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 26.01

Section: 26.01

Topic: Nervous System Infections

3. The cavities inside the brain are termed

- A. sinuses.
- B. ventricles.**
- C. cavities.
- D. sulci.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 26.02

Section: 26.01

Topic: Nervous System Infections

4. The membranes that cover the surface of the brain and spinal cord are known as the

- A. neurolemma.
- B. dura mater.
- C. meninges.**
- D. collagen.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 1. Remember

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

5.

To determine the causative agent of a central nervous system (CNS) infection, a sample is taken from the

- A. cerebrospinal fluid.**
- B. arterial blood.
- C. venous blood.
- D. urine.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

6. The nervous system typically
- A. is sterile.
 - B. has a small number of normal flora.
 - C. contains Gram-positive bacteria.
 - D. contains a small number of viruses.

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

7. An infection of the membranes covering the brain is called
- A. encephalitis.
 - B. meningitis.
 - C. arachnitis.
 - D. ventriculitis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

8.

The central nervous system (CNS) may become infected through the

- A. bloodstream.
- B. nerves.
- C. extensions from bone.
- D. ventricles.
- E. bloodstream, nerves AND extensions from bone.

Bloom's Level: 2. Understand

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

Chapter 26 - Nervous System Infections

9.

The chief source of central nervous system (CNS) infections is through the

- A. bloodstream.
- B. genitourinary system.
- C. skin.
- D. nerves.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

10. The leading cause of bacterial meningitis in adults is

- A. *Escherichia coli*.
- B. *Haemophilus influenzae*.
- C. *Streptococcus pneumoniae*.
- D. *Neisseria meningitidis*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

11. Identification of the various strains of *N. meningitidis* is through

- A. Gram staining.
- B. serogrouping.
- C. fluorescent antibodies.
- D. titering.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

12. *Meningococcal meningitis* is typically acquired through the

- A. genitourinary tract.
- B. respiratory tract.**
- C. gastrointestinal tract.
- D. skin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.04

Section: 26.02

Topic: Genitourinary Infections

13. The meningococcus attach to the mucus membrane via

- A. flagella.
- B. pili.**
- C. cilia.
- D. a capsule.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

14. Epidemics of meningitis appear to involve

- A. *Streptococcus pneumoniae*.
- B. *Haemophilus influenzae*.
- C. *Neisseria meningitidis*.**
- D. *Streptococcus pyogenes*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

15. Which is true of listeriosis?

- A. It is a foodborne disease.
- B. It may result in meningitis.
- C. It is usually asymptomatic in healthy people.
- D. It is caused by an organism that can grow at refrigerator temperatures.
- E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

16. Leprosy is

- A. an infectious disease caused by a bacterium.
- B. a disease of the blood.
- C. also known as Hansen's disease.
- D. described in the Bible.
- E. an infectious disease caused by a bacterium, also known as Hansen's disease AND described in the Bible.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

17. *Mycobacterium leprae* has a generation time of

- A. 20 minutes.
- B. 1 hour.
- C. 6 hours.
- D. 12 days.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

18. The only known human pathogen that preferentially attacks the peripheral nerves is

- A. *N. meningitidis*.
- B. polio virus.
- C. *E. coli*.
- D.** *M. leprae*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

19. The limited type of leprosy in which cell-mediated immunity suppresses proliferation of the bacilli is called

- A. lepromatous.
- B. limited.
- C. immune.
- D.** tuberculoid.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

20. The incubation period of leprosy is

- A. 1 week.
- B. 3 weeks.
- C. 3 months.
- D.** 3 or more years.

Bloom's Level: 1. Remember

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

21. *M. leprae* may infect
- A. mangabey monkeys.
 - B. skunks.
 - C. iguanas.
 - D. armadillos.
 - E. mangabey monkeys AND armadillos.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

22. The transmission of leprosy is by
- A. direct human-to-human contact.
 - B. the fecal-oral route.
 - C. contact with infected blood products.
 - D. contact with infected nasal secretions.
 - E. direct human-to-human contact AND contact with infected nasal secretions.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

23. Which is true about *C. botulinum*?
- A. It is anaerobic.
 - B. It may form spores.
 - C. It produces a neurotoxin.
 - D. It does not grow well below pH 4.5.
 - E. All of the choices are correct.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

24.

Which is true of the *Clostridium botulinum* toxin?

- A. It is heat-sensitive.
- B. It is a neurotoxin.
- C. It blocks nerve to muscle signal transmission.
- D. It is a two-part toxin.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

25. Intestinal botulism, especially in infants, has been linked to ingestion of

- A. seafood.
- B. milk.
- C. applesauce.
- D.** honey.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

Chapter 26 - Nervous System Infections

26.

Food contaminated with *Clostridium botulinum* often

- A. looks odd.
- B. smells bad.
- C. tastes bad.
- D.** appears normal.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

27. Viral central nervous system infections may result in

- A. meningitis.
- B. encephalitis.
- C. poliomyelitis.
- D. rabies.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.07

Section: 26.03

Topic: Nervous System Infections

28. Humans acquire the arbovirus that causes epidemic encephalitis by
- A. the fecal-oral route.
 - B. human to human contact.
 - C. contaminated food.
 - D.** the bite of an infected mosquito.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.07

Section: 26.03

Topic: Nervous System Infections

29. Which animal is used as an early warning system for encephalitis?
- A. armadillos
 - B. mice
 - C.** chickens
 - D. foxes

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.07

Section: 26.03

Topic: Nervous System Infections

30. The poliomyelitis virus appears to selectively destroy
- A. sensory nerve cells.
 - B. mixed nerve cells.
 - C. autonomic nerve cells.
 - D.** motor nerve cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

31. Which is true of the poliomyelitis virus?

A.

non-enveloped

B. single-stranded DNA

C. double-stranded RNA

D. single-stranded RNA

E.

non-enveloped AND single-stranded RNA

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

32. The polio viruses usually enter the body through

A. the oral route.

B. contaminated blood.

C. cuts in the skin.

D. the respiratory route.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

33. The poliomyelitis virus is in the picornavirus family in the subgroup

- A. adenoviruses.
- B. enteroviruses.**
- C. arboviruses.
- D. dermatropic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

34. The early symptoms of rabies generally begin

- A. 1 day after viral entry.
- B. 1-2 months after viral entry.**
- C. 6 months after viral entry.
- D. 1 year after viral entry.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

35. The symptom at the site of an animal bite that suggests rabies as a possible diagnosis is

- A. inability to heal.
- B. blue-green pus.
- C. tingling or twitching.**
- D. festering without fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

36. Painful spasms of the throat triggered by swallowing or the sight of water is called

- A. hydrophobia.
- B. hydrophagia.
- C. tetany.
- D. paralysis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

37. The principal mode of transmission of rabies is through

- A. blood.
- B. fomites.
- C. saliva.
- D. pus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

38. In rabies, the virus multiplies in one kind of cell then binds to receptors in the

- A. neuromuscular region.
- B. spinal cord.
- C. respiratory area.
- D. brain.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

39. The incubation period of rabies is partially determined by

- A. age of the patient.
- B. season of the year that the disease is acquired.
- C. length of journey from the bite site to the brain.
- D. the amount of virus introduced into the wound.
- E. length of journey from the bite site to the brain AND the amount of virus introduced into the wound.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

40. Characteristic inclusion bodies formed in cells of organisms infected with rabies are called

- A. Negri bodies.**
- B. metachromatic bodies.
- C. polyphasic bodies.
- D. Koplik spots.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

41. Stained smears of the surface of the eye might be useful in diagnosing

- A. influenza.
- B. herpes.
- C. polio.
- D. rabies.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

Chapter 26 - Nervous System Infections

42.

Central nervous system (CNS) diseases caused by fungus may occur in

- A. cancer patients.
- B. diabetics.
- C. AIDS patients.
- D. immunosuppressed people.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.10

Section: 26.04

Topic: Nervous System Infections

43.

Cryptococcal meningoencephalitis caused by *Cryptococcus gattii* differs from the general pattern of fungal central nervous system (CNS) disease by occurring in

- A.** otherwise healthy people.
- B. children.
- C. AIDS patients.
- D. immunosuppressed people.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.10

Section: 26.04

Topic: Nervous System Infections

44. *Naegleria fowleri* may cause
- A. meningitis.
 - B. primary amebic meningoencephalitis.**
 - C. African sleeping sickness.
 - D. AIDS.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.11

Section: 26.05

Topic: Nervous System Infections

45. African sleeping sickness is transmitted by
- A. ticks.
 - B. black flies.
 - C. *Aedes* mosquitoes.
 - D. tsetse flies.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.11

Section: 26.05

Topic: Nervous System Infections

46. The more severe form of African sleeping sickness is called the
- A. Gambian form.
 - B. Rhodesian form.**
 - C. Guyanan form.
 - D. Brazilian form.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.11

Section: 26.05

Topic: Nervous System Infections

47. Corneal implants have been implicated in a few cases of

A.

botulism.

B. trypanosomiasis.

C. Creutzfeldt-Jakob.

D. scrapie.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.12

Section: 26.06

Topic: Nervous System Infections

48. Which is true about prions?

A. They cause a degenerative brain condition.

B. They are naked pieces of RNA.

C. They are made of DNA and protein.

D. They are a normal brain protein that has folded differently.

E. They cause a degenerative brain condition AND they are a normal brain protein that has folded differently.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.12

Section: 26.06

Topic: Nervous System Infections

True / False Questions

Chapter 26 - Nervous System Infections

49.

Inflammation of the membranes covering the central nervous system (CNS) is called meningitis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

50.

The initial symptoms of bacterial meningitis are the same regardless of the causative agent.

TRUE

Bloom's Level: 2. Understand

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

51. *Mycobacterium leprae* is only grown in living cells.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.05

Section: 26.02

Topic: Nervous System Infections

52. Death from botulism is usually due to respiratory paralysis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

53. Viral meningitis is much more common than bacterial meningitis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.07

Section: 26.03

Topic: Nervous System Infections

54. All cases of paralytic polio acquired in the U.S. between 1980 and 1999 were caused by Sabin's polio vaccine.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

55. Meningoencephalitis and African sleeping sickness are both caused by protozoans.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.11

Section: 26.05

Topic: Nervous System Infections

56. Prions are small single-stranded pieces of RNA.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 26.12

Section: 26.06

Topic: Nervous System Infections

Multiple Choice Questions

57. Why can an infection in the brain's ventricles usually be detected in spinal fluid obtained from the lower back (lumbar region)?

- A.** Cerebrospinal fluid (CSF) originates in the ventricles, but percolates over and around the brain and spinal cord.
- B. There is a high degree of vascularity that exists, allowing easy transfer of bacteria in the cerebrospinal fluid (CSF) and the blood.
- C. There is a set of lymph nodes specifically in place to drain the cerebrospinal fluid (CSF) from the ventricles. They are housed in the lumbar region of the spinal column, adjacent to the spinal cord.
- D. This is an incorrect statement. Since the central nervous system (CNS) is a protected site due to the blood-brain barrier, there can never BE an infection in the ventricles.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.03

Section: 26.01

Topic: Nervous System Infections

58. Why are such a high percentage of infant botulism cases associated with ingestion of honey?

- A. Bees cultivate *C. botulinum* bacteria within their hives as a food source, so it gets mixed in with the honey.
- B. The infant digestive tract is far more susceptible to the effects of botulism toxin (found in the honey in relatively high levels) than the adult digestive tract.
- C. The spores of *C. botulinum* produce a strong endotoxin. This endotoxin has little effect on adults due to their overall size. Infants, however, are significantly smaller (and therefore far more susceptible) than adults.

D.

There can be endospores from *C. botulinum* in honey. They may germinate in the intestines of infants following consumption of honey, leading to colonization and pathogenesis as the bacteria begin forming botulism toxin. Adults' normal intestinal microbiota will out-compete the new microbes, but very young infants may not yet have this normal flora established.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.06

Section: 26.02

Topic: Nervous System Infections

59. Why would the Sabin oral polio vaccine need to be eliminated as we get closer and closer to eradication of the polio virus?

- A.** Since it is a live, attenuated viral vaccine, there's always the chance it could revert back into a pathogenic state by mutation. This would introduce new strains still capable of causing the illness into human populations, thwarting elimination.
- B. The Sabin vaccine is cheaper than the Salk (killed virus) vaccine, but it isn't as effective at producing a protective response. We'll need to shift to the more effective Salk vaccine worldwide eventually to complete the eradication process.
- C. The Salk vaccine is far cheaper than the Sabin vaccine. To effectively eradicate polio, we'll need to shift all of our resources into the cheapest and easiest to deliver vaccine possible. That is the Salk vaccine.
- D. The Sabin vaccine can only be administered to human beings. We need to vaccinate bird populations as well to effectively control the spread of polio. Birds are a natural reservoir for the virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.08

Section: 26.03

Topic: Nervous System Infections

60.

What underlying infection should a physician immediately suspect when confronted with a patient with confirmed cryptococcal meningoencephalitis caused by *Cryptococcus neoformans*, and why?

- A. Influenza infection. The 2 viruses are often transmitted together in respiratory droplets.
- B.** HIV infection. People with normal immune systems generally fend off this fungal infection before it becomes clinically symptomatic.
- C. Varicella zoster virus (chicken pox). During the incubation period for chicken pox, and during its latency, *C. neoformans* has an increased ability to colonize the respiratory tract.
- D. Syphilis. This sexually-transmitted illness depletes CD4+ helper T cells that are necessary to directly attack the fungal infection of *C. neoformans*.

Bloom's Level: 5. Evaluate

Learning Outcome: 26.10

Section: 26.04

Topic: Nervous System Infections

61. You're a famous eye surgeon, specializing in corneal transplants. Give your choice, would you rather have a cornea for transplantation from a 20 year old individual, or a 60 year old individual (assuming there are no optical defects due to age), and why?
- A. The 60 year old-clearly, if the individual has gone 60 years with no optical defects, this is a very good organ for transplantation. The 20 year old cornea may have defects that simply haven't become apparent yet.
 - B. The 20 year old cornea-younger is always better when dealing with tissue transplants. You want to give the transplant the longest possible time for survival in the recipient.
 - C. The 20 year old cornea-while extremely rare, it may be possible to transmit prions through corneal transplants. It's less likely that a 20 year old would have encountered and become contaminated by prions than the 60 year old.
 - D. The 20 year old cornea-never mind prions, there are a *variety* of agents that can hide in corneal tissues and that might cause disease. It's far more likely that the 60 year old would be harboring one or more of these pathogens than the 20 year old.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.13

Section: 26.06

Topic: Nervous System Infections

62. Why is it important to learn about rabies when only a few cases occur in the United States each year?
- A. The US isn't the entire world. Rabies might be more common in other areas, and it's important to understand due to its lethality.
 - B. The only reason why rabies isn't common in the US is due to our lack of interaction with animal carriers. We could very easily have an outbreak on our hands if we don't know the warning signs to watch for that we've learned about by studying the virus and disease.
 - C. Rabies can never be completely eliminated-it has too many different animal reservoirs/carriers. As such, we need to remain constantly aware of how to protect human populations, both by preventing and treating the illness. We can only do that by learning about it.
 - D. All of the above are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.09

Section: 26.03

Topic: Nervous System Infections

63. A pathologist claims it's much easier to determine the causative agent of meningitis than an infection of the skin or intestines. Is this true? Why or why not?

A. It's not true-an infection is an infection, and it's always difficult to track down the exact causative agent. The organ system involved in the illness has nothing to do with identification of the causative agent.

B.

It's true-because the central nervous system (CNS) is generally microbe free, whereas the skin and intestines have a diverse normal flora. Separating out a pathogenic causative agent from the normal microbiota in these areas would be much harder to do than in the central nervous system (CNS).

C.

It's not true-the ventricles of the brain can provide a direct route for microbes to enter the central nervous system (CNS) from the bloodstream/extracellular fluid. Therefore, it would be just as likely to find a pathogenic microbe in the central nervous system (CNS) as it would be in the skin or intestines.

D. It's true-there are only 1 or 2 microbes that can cause meningitis, yet there are hundreds (if not thousands) that can cause skin/intestinal infections. This makes it much easier to determine the causative agent for a case of meningitis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 26.04

Section: 26.02

Topic: Nervous System Infections

Chapter 27 Genitourinary Infections

Multiple Choice Questions

1. *Treponema pallidum*

- A. is the organism that causes syphilis.
- B. is a spirochete.
- C. can be more easily viewed with dark-field illumination.
- D. has become less virulent over time.
- E.** All of the above are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

2. Urinary tract infections

- A. are relatively rare.
- B. are the most common nosocomial infections.
- C. include puerperal fever.
- D.

are not considered STIs.

E.

are the most common nosocomial infections AND are not considered STIs.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

3. The urinary tract above the bladder usually shows

A.

Escherichia coli.

B.

Staphylococcus aureus.

C.

Proteus vulgaris.

D. no bacteria.

E.

Escherichia coli AND *Staphylococcus aureus*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

4.

The normal microbiota of the lower urethra may show

A. *Lactobacillus*.

B. *Staphylococcus*.

C. *Corynebacterium*.

D. *Bacteroides*.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

Chapter 27 - Genitourinary Infections

5.

The normal microbiota of the genital tract of women is

- A. affected by estrogen levels.
- B. dependent on the activity of *Lactobacillus*.
- C. unchanging.
- D.

typically composed of *Escherichia coli*.

E. affected by estrogen levels AND dependent on the activity of *Lactobacillus*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

6. The most common urinary infection is

- A. vulvovaginal candidiasis.
- B. toxic shock syndrome.
- C.** bacterial cystitis.
- D. bacterial vaginosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.02

Section: 27.02

Topic: Genitourinary Infections

7. Bacterial cystitis

A. is a common nosocomial disease.

B.

is typically caused by *Escherichia coli*.

C. may occur through the use of a catheter.

D. is unusual in men under 50.

E. All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.02

Section: 27.02

Topic: Genitourinary Infections

8. A disease in which the urinary system is infected from the bloodstream is known as

A. cystitis.

B. pyelonephritis.

C. candidiasis.

D. leptospirosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.03

Section: 27.02

Topic: Genitourinary Infections

9. Leptospirosis is often contracted

A. by eating infected animals.

B. by eating contaminated vegetables.

C. from contaminated animal urine.

D. by the respiratory route.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.03

Section: 27.02

Topic: Genitourinary Infections

10. Pregnant women with bacterial vaginosis are at risk of
- A. placental insufficiency.
 - B. being unable to nurse.
 - C. being unable to deliver vaginally.
 - D.** having a premature baby.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

11. The genital tract infection characterized by an unpleasant odor and an increase in clue cells is
- A. trichomoniasis.
 - B. candidiasis.
 - C. amoebiasis.
 - D.** bacterial vaginosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

12. Among the major causes of vulvovaginal candidiasis is/are

- A. sexual promiscuity.
- B. intense antibacterial treatment.
- C.

disruption of normal microbiota.

D. the use of oral contraceptives.

E.

intense antibacterial treatment, disruption of normal microbiota AND the use of oral contraceptives.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

13. *Staphylococcus aureus* is the causative agent of

- A. bacterial vaginosis.
- B. puerperal fever.
- C.** toxic shock syndrome.
- D. gas gangrene.
- E. bacterial vaginosis AND puerperal fever.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

14. Toxic shock syndrome

A.

is due to exotoxins produced by *Streptococcus pyogenes*.

B.

is due to exotoxins produced by *Staphylococcus aureus*.

C. may spread from person to person.

D. has a very low rate of recurrence, approximately 1%.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.04

Section: 27.03

Topic: Digestive System Infections

15. The incubation period of gonorrhea is approximately

A. 2-5 days.

B. 1-2 weeks.

C. 14-21 days.

D. several months.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

Chapter 27 - Genitourinary Infections

16.

Gonococci infect ...

- A. cows.
- B. iguanas.
- C. sheep.
- D. humans.**
- E. cows AND sheep.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

17. Gonococci selectively attach to certain epithelial cells by

- A. pili.**
- B. flagella.
- C. cilia.
- D. actin bridges.
- E. flagella AND cilia.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

18. Typically pathogenic *Neisseria gonorrhoeae*

- A. secretes transferrin.
- B.** destroys IgA.
- C. destroys IgM.
- D. is very immunogenic.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

19. Untreated gonorrhea in males may lead to

- A. sterility.
- B. urinary tract infections.
- C. prostatic abscesses.
- D. orchitis.
- E.** All of the choices are correct.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

20. A frequent complication of untreated gonorrhea in women is

- A.** pelvic inflammatory disease.
- B. syphilis.
- C. dysuria.
- D. vaginal discharge.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

21. The treatment of neonates with an erythromycin ointment placed directly into the eyes is to prevent

- A. viral conjunctivitis.
- B. cataracts.
- C. herpes.
- D. ophthalmia neonatorum.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

22. Which of the following mimics the infection caused by *Neisseria gonorrhea*?

A.

Chlamydia trachomatis

B.

Mycoplasma pneumonia

C.

Treponema pallidum

D.

Escherichia coli

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

Chapter 27 - Genitourinary Infections

23.

The most common reportable STI in the U.S. is

A. gonorrhea.

B.

a chlamydial infection.

C. syphilis.

D. AIDS.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

24. The disease that results from *Chlamydia trachomatis* possibly attaching to sperm and ascending into the fallopian tubes is

A. conjunctivitis.

B. neonatorum ophthalmia.

C. pelvic inflammatory disease.

D. trachoma.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

25. The infectious form of *Chlamydia trachomatis* is a(n)

- A. reticulate body.
- B.** elementary body.
- C. primary element.
- D. core body.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

26. The causative agent of syphilis is

- A. papilloma virus.
- B. *Neisseria gonorrhoeae*.
- C. *Chlamydia trachomatis*.
- D.** *Treponema pallidum*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

27. *Treponema pallidum* is similar in shape to

- A. *Escherichia coli*.
- B. *Staphylococcus aureus*.
- C.** *Leptospira interrogans*.
- D. herpes virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

28. Compared to the first big syphilis epidemic several hundred years ago in Europe, the strains of *Treponema pallidum* that cause syphilis today

- A. tend to be more virulent.
- B. tend to be less virulent.**
- C. are about equally virulent.
- D. cannot be compared.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

29. Which of the following manifests itself in three clinical stages?

- A. gonorrhea
- B. syphilis**
- C. trachoma
- D. non-gonococcal urethritis

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

30. The presence of a hard chancre in primary syphilis is representative of the body's

- A. intense inflammatory response.**
- B. antibody response.
- C. rejection of the invaded tissue.
- D. septicemia due to infiltration of the organism.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

31. During which stage of syphilis is the patient non-infectious?

- A. first
- B. second
- C. third
- D. fifth

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

32. In which disease is a gumma formed?

- A. primary syphilis
- B. secondary gonorrhea
- C. tertiary syphilis
- D. diphtheria

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

33.

During which stage of pregnancy can *Treponema pallidum* cross the placenta and possibly infect the fetus?

- A. first trimester.
- B. second trimester.
- C. third trimester.
- D. any stage.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

Chapter 27 - Genitourinary Infections

34.

The reservoir of *Treponema pallidum* is the

- A. guinea pig.
- B. fox.
- C. bat.
- D. human.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

35.

The *Treponema pallidum* of syphilis can be transmitted by

- A. sexual or oral contact.**
- B. contact with contaminated objects.
- C. clothing.
- D. the fecal-oral route.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

36. The sexually transmitted disease characterized by painful genital ulcers is

- A. chancroid.
- B. syphilis.
- C. gonorrhea.
- D. trachoma.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

37. Which of the following diseases may manifest themselves with painful genital ulcers?

- A. chancroid
- B. rubeola
- C. herpes
- D. leptospirosis
- E.

chancroid AND herpes

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

38. Which of the following is a small Gram-negative rod requiring X-factor for growth?

- A. *Escherichia coli*.
- B. *Treponema pallidum*.
- C. *Neisseria gonorrhoeae*.
- D. *Haemophilus ducreyi*.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

39. The usual cause of genital herpes is

- A. herpes simplex virus type 1.
- B. herpes simplex virus type 2.**
- C. herpes simplex virus type 3.
- D. herpes simplex virus type 4.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

40. Which of the following viruses maintains a latent state in nerve cells?

- A. herpes virus.**
- B. hepatitis A virus.
- C. Norwalk virus.
- D. rotavirus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

41. Herpes simplex, like other ulcerating genital diseases,

- A. promotes the spread of AIDS.**
- B. inhibits the spread of AIDS.
- C. inhibits the growth of other viral disease.
- D. is easily cured with antibiotics.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

42. The drug(s) used to treat genital herpes is/are

- A. penicillin.
- B. erythromycin.
- C. acyclovir.
- D. famciclovir.
- E. acyclovir AND famciclovir.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

43. The most common of the sexually transmitted viral diseases agents is

- A. human papillomavirus.**
- B. herpes virus.
- C. human immunodeficiency virus.
- D. leptospirosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

44. Human papillomavirus is

- A. a small, non-enveloped double-stranded DNA virus.**
- B. a small, enveloped double-stranded DNA virus.
- C. a large, enveloped double-stranded RNA virus.
- D. a small, non-enveloped single-stranded DNA virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

45. Which of the following is associated with cervical cancer?

- A. gonorrhea
- B. genital warts**
- C. syphilis
- D. chancroid

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

46. A single exposure to HPV results in infection _____ of the time.

- A. 10%
- B. 30%
- C. 60%**
- D. 100%

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

47. HPV

- A. can integrate into the host's chromosome.
- B. may be split into cancer-associated and wart-causing types.
- C. infections always lead to cancer.
- D. cannot infect newborns at birth.
- E. can integrate into the host's chromosome AND may be split into cancer-associated and wart-causing types.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

48. The human immunodeficiency virus is a(n)
- A. non-enveloped double-stranded DNA virus.
 - B. enveloped double-stranded DNA virus.
 - C. enveloped single-stranded RNA virus.**
 - D. non-enveloped single-stranded DNA virus.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

49. HIV attacks a variety of cell types but the most critical are
- A. red blood cells.
 - B. nerve cells.
 - C. platelets.
 - D. T helper cells.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

50. HIV typically attaches to
- A. protein A.
 - B. C3b.
 - C. C5a.
 - D. CD4.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

51. HIV adversely affects

- A. red blood cells.
- B. nerve cells.
- C. macrophages.
- D. T helper cells.
- E.** macrophages AND T helper cells.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

52. Treatment of HIV attempts to

- A. block reverse transcriptase activity.
- B. block attachment to host cells.
- C. block viral integrase.
- D. block viral protease activity.
- E.** All of the above

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

53. HIV may be present in

- A. blood.
- B. semen.
- C. tears.
- D. vaginal secretions.
- E.** blood, semen AND vaginal secretions.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

Chapter 27 - Genitourinary Infections

54. Trichomoniasis is caused by a

- A. fungus.
- B. virus.
- C. bacteria.
- D.** protozoan.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 27.11

Section: 27.07

Topic: Genitourinary Infections

55. *Trichomonas vaginalis* is an unusual eukaryote in that it

- A. has chloroplasts.
- B.** lacks mitochondria.
- C. has flagella.
- D. lacks a nuclear membrane.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.11

Section: 27.07

Topic: Genitourinary Infections

True / False Questions

56. Women are more likely than men to get urinary tract infections due to anatomy.

TRUE

ASM Objective: 07.03b Ability to communicate and collaborate with other disciplines: Identify credible scientific sources and interpret and evaluate the information therein.

ASM Topic: Module 07 Scientific Thinking

Bloom's Level: 2. Understand

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

57. Urine contains antimicrobial substances.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

58. Toxic shock syndrome toxins are superantigens.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

59. Most strains of gonococcus do not survive long outside the body.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

60. There is no long-lasting immunity to gonorrhea and one may contract gonorrhea repeatedly.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

61. The patient is non-infectious in the third stage of syphilis.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.08

Section: 27.05

Topic: Genitourinary Infections

62. Genital herpes may be cured with the use of acyclovir or famciclovir.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

63. Protease inhibitors are useful in curing AIDS.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

64. *Trichomonas vaginalis* lacks mitochondria.

TRUE

ASM Objective: 02.04 The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 27.11

Section: 27.07

Topic: Genitourinary Infections

65. Herpes simplex enhances the spread of AIDS.

TRUE

ASM Objective: 06.04 Because the true diversity of microbial life is largely unknown, its effects and potential benefits have not been fully explored.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.09

Section: 27.06

Topic: Genitourinary Infections

66.

Typically *Candida albicans* causes no symptoms.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 27.04

Section: 27.03

Topic: Genitourinary Infections

Multiple Choice Questions

67. What changes might occur in the vagina if lactobacilli were eliminated?

- A. The acidic pH might change to a more neutral (and pathogen-fostering) level.
- B. Lactobacilli often produce the anti-anaerobic bacteria compound hydrogen peroxide. Without it, anaerobic pathogens might cause disease states (e.g. gas gangrene).
- C.

There would be no change in the health of the woman-other members of the normal microbiota would 'fill in the gap' in the population, resulting in no overall change.

D. The acidic pH might change to a more neutral (and pathogen-fostering) level AND lactobacilli often produce the anti-anaerobic bacteria compound hydrogen peroxide. Without it, anaerobic pathogens might cause disease states (e.g. gas gangrene).

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

68. Why is puerperal fever not regarded as a sexually transmitted disease? What spreads the disease?

A. A physician that doesn't observe proper sterile technique may introduce bacteria from the environment into the genitourinary tract of a woman during delivery of a child, inducing puerperal fever several days later.

B. The trauma of the delivery of the placenta through the vaginal tract after the fetus introduces bacteria directly into the bloodstream, resulting in puerperal fever.

C.

A woman's own normal fecal microbiota can occasionally cause puerperal fever if it contaminates the genitourinary tract following delivery. This can especially occur after an episiotomy procedure (cutting between the vaginal opening and the rectum).

D.

A physician that doesn't observe proper sterile technique may introduce bacteria from the environment into the genitourinary tract of a woman during delivery of a child, inducing puerperal fever several days later AND a woman's own normal fecal microbiota can occasionally cause puerperal fever if it contaminates the genitourinary tract following delivery. This can especially occur after an episiotomy procedure (cutting between the vaginal opening and the rectum).

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 27.01

Section: 27.01

Topic: Genitourinary Infections

69.

Why might an individual with an STI need to be checked for other STIs, even though he/she has no symptoms of any others?

A.

Several STI-causing pathogens are known to 'piggy back' on each other, being carried into the genital tract together.

B.

A diagnosis of an STI implies that the individual engaged in unprotected sexual intercourse. Several STIs are largely asymptomatic, so it is wise to test for a variety of typical STIs when the patient admits to or shows signs of engaging in such risky behavior.

C.

They don't need to be tested-all STIs are highly obviously symptomatic, so there is no need to test for other diseases than the one currently manifesting itself in the patient.

D.

It's a public health issue-it's best to know who is positive for what in the population of sexually-active individuals. This lets healthcare professionals act to best safeguard the population as a whole from the range of STIs.

ASM Objective: 01.03 Human impact on the environment influences the evolution of microorganisms (e.g. emerging diseases and the selection of antibiotic resistance).

ASM Topic: Module 01 Evolution

Bloom's Level: 5. Evaluate

Learning Outcome: 27.05

Section: 27.04

Topic: Genitourinary Infections

70. Why should scarring of a fallopian tube raise the risks of an ectopic pregnancy?

- A. Scarring may slow the progression of the ovum (egg) from the fallopian tubes into the uterus. If it is fertilized by a sperm cell while it is stopped in the fallopian tube, it may implant there, resulting in an ectopic pregnancy.
- B. Scarring can completely block the ovum (egg) from being able to exit the fallopian tube to enter the uterus. It may implant in the wall of the fallopian tube (since it can't enter the uterus) and result in an ectopic pregnancy.
- C. Scarring may allow the sperm cells to enter the fallopian tubes and bind to the scar tissue. The inflammatory response generated when this occurs is termed an ectopic pregnancy.
- D. Scarring of the fallopian tubes results from undiagnosed bacterial infections. These bacteria can also make the lining of the uterus inhospitable to implantation of a fertilized egg. If the fertilized egg can't implant into the wall of the uterus, it may travel back into the fallopian tube and implant there instead, resulting in an ectopic pregnancy.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 27.07

Section: 27.05

Topic: Genitourinary Infections

71. Former president Ronald Reagan once commented at a press conference that the best way to combat the spread of AIDS in the US was to prohibit everyone from having sexual contact for 5 years. What would be the success of such a program if it were possible to carry out?

A. It would 'cure' the population of HIV/AIDS. Everyone that had it would die off, and no new cases would occur, since sexual contact is the only mode of transmission for this virus.

B. It would be a failure-this 'program' wouldn't eliminate IV drug use or transmission of HIV from mother to child. Sexual transmission isn't the ONLY mode of transmission for this virus.

C. It would be a failure-many HIV positive individuals survive for longer than 5 years, even without treatment (sometimes without even realizing they're positive). Once sexual contact resumed, sexual transmission would also resume.

D. It would be a failure-this 'program' wouldn't eliminate IV drug use or transmission of HIV from mother to child. Sexual transmission isn't the ONLY mode of transmission for this virus, AND many HIV positive individuals survive for longer than 5 years, even without treatment (sometimes without even realizing they're positive). Once sexual contact resumed, sexual transmission would also resume.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 27.10

Section: 27.06

Topic: Genitourinary Infections

Chapter 28 HIV Disease and Complications of Immunodeficiency

Multiple Choice Questions

1. An early contributor to the understanding of nitrogen fixation was
- A. Hooke.
 - B. Pasteur.
 - C. Winogradsky.
 - D.** Beijerinck.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.01

Section: 28.01

Topic: History of Microbiology

2. The term used to describe the interrelationship between the living and non-living environments in an area is called a(n)
- A. group.
 - B. community.
 - C.** ecosystem.
 - D. ecological niche.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.01

Section: 28.01

Topic: Microbial Ecology

3. The role that an organism plays in its environment is called its

- A. role.
- B. position.
- C. ecosystem.
- D.** niche.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.01

Section: 28.01

Topic: Microbial Ecology

4. The region of the earth inhabited by living organisms is called the

- A. niche.
- B. ecosystem.
- C. community.
- D.** biosphere.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.01

Section: 28.01

Topic: Microbial Ecology

5. The environment immediately surrounding an individual cell is called its

- A. macroenvironment.
- B.** microenvironment.
- C. microniche.
- D. colony.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.01

Section: 28.01

Topic: Microbial Ecology

6. Which group is composed of autotrophs?

- A. primary producers
- B. primary consumers
- C. secondary consumers
- D. decomposers

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.01

Section: 28.01

Topic: Microbial Ecology

7. Biofilms are likely to be found in environments

- A. that are nutrient rich.
- B. that are relatively warm.
- C. with rapidly flowing water.
- D. with low nutrients.

ASM Objective: 05.02 Most bacteria in nature live in bio-film communities.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.02

Section: 28.01

Topic: Microbial Ecology

8. A microbial mat

- A. is a form of biofilm.
- B. is poorly organized.
- C. contains only obligate anaerobes.
- D. is constructed to prevent interactions between the various layers of microorganisms.
- E. is a form of biofilm AND is poorly organized.

ASM Objective: 05.02 Most bacteria in nature live in bio-film communities.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.05

Section: 28.01

Topic: Microbial Ecology

9. The practice of cells turning on the production of some enzymes and turning off others in response to a changing environment is called

- A. compromise.
- B. metabolism.
- C. nutritional metabolism.
- D.** adaptation.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 28.04

Section: 28.01

Topic: Microbial Ecology

10. The problem of not being able to cultivate most microorganisms has led to the use of

- A. FISH.
- B. microscopy with fluorescent dyes.
- C. 16s rRNA analysis.
- D. DGGE.
- E.** All of these methods help identify microorganisms in the environment.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 3. Apply

Learning Outcome: 28.06

Section: 28.02

Topic: Microbial Ecology

11. Nutrient poor waters are described as being

- A. hypoxic.
- B.** oligotrophic.
- C. autotrophic.
- D. eutrophic.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.07

Section: 28.03

Topic: Microbial Ecology

12. Eutrophic waters

- A. are nutrient rich.
- B. may become hypoxic.
- C. lack phosphate, nitrate and iron.
- D. contain 3.5% salt.
- E.** are nutrient rich AND may become hypoxic.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.07

Section: 28.03

Topic: Microbial Ecology

13. It is estimated that the mass of bacteria and fungi in the top six inches of an acre of soil is

- A.** 2 tons.
- B. 100 lb.
- C. 10 tons.
- D. 500 lb.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Topic: Microbial Ecology

14. The bacteria cultured from a soil sample typically represents

- A. all the bacteria present in that sample.
- B.** a very small number of bacteria present in that sample.
- C. all the metabolically active bacteria.
- D. all the metabolically inactive bacteria.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

15. Bacteria survive adverse conditions by forming

- A. zygotes.
- B. capsules.
- C. glycocalyx.
- D.** endospores.

ASM Objective: 02.02 Bacteria and Archaea have specialized structures (e.g. flagella, endospores, and pili) that often confer critical capabilities.

ASM Topic: Module 02 Structure and Function

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

16. The organic matter in soil is referred to as

- A. mineral soil.
- B. inorganic substance.
- C. bedrock.
- D.** humus.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

17. Geosmins are

- A. a strain of *Bacillus*.
- B. nitrogen-fixing bacteria.
- C.** metabolites that give soil its odor.
- D. produced by *Rhizobium*.
- E. metabolites that give soil its odor AND produced by *Rhizobium*.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

18. *Streptomyces*

- A. may produce antibiotics.
- B. may produce geosmins.
- C. will swarm together to form fruiting bodies.
- D. are typically found in the soil.
- E.** may produce antibiotics, may produce geosmins AND are typically found in the soil.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

19. Which of the following soil organisms play a major role in decomposing plant matter?

- A. bacteria
- B. fungi
- C. protozoa
- D. viruses
- E.** bacteria AND fungi

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

20. The major effect of excess water in the soil is

- A. increase the level of oxygen.
- B.** lower the amount of oxygen.
- C. reduce the pH.
- D. increase the amount of nitrogen.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

21. The zone of soil that surrounds the roots and contains a variety of organic exudates is called the

- A. mycorrhizae.
- B. rootsphere.
- C. rhizosphere.**
- D. geosmin.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

22. The organisms that obtain energy by oxidation of hydrogen sulfide and use carbon dioxide as a carbon source are called

- A. heterotrophs.
- B. chemoheterotrophs.
- C. autotrophs.
- D. chemolithoautotrophs.**

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

23. Which of the following may be used by prokaryotes, under anaerobic conditions, as terminal electron acceptors?

- A. nitrate
- B. nitrite
- C. sulfate
- D. carbon dioxide
- E. All of the choices are correct.**

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

24. The carbon cycle revolves around

- A. nitrogen.
- B. water.
- C. phosphorus.
- D.** carbon dioxide.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

25. The organisms that convert carbon dioxide into organic matter are the

- A. secondary consumers.
- B. primary consumers.
- C.** producers.
- D. decomposers.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

26. Turning inorganic carbon into organic carbon is called

- A. mineralization.
- B. eutrophication.
- C. respiration.
- D.** carbon fixation.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

27. During aerobic decomposition of organic matter the primary gas produced is

- A. oxygen.
- B. hydrogen sulfide.
- C. nitrogen.
- D. carbon dioxide.**

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

28. During anaerobic decomposition of organic matter with carbon dioxide as the terminal electron acceptor, the primary gas(es) produced is/are

- A. oxygen.
- B. hydrogen sulfide.
- C. methane.**
- D. hydrogen.
- E. methane AND hydrogen.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

29. Next to carbon and oxygen, the element organisms most require is

- A. sulfur.
- B. phosphorus.
- C. nitrogen.**
- D. iron.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.04

Topic: Microbial Ecology

30. Atmospheric nitrogen is

- A. used directly by plants.
- B. used directly by animals.
- C. turned into ammonia by microorganisms.**
- D. directly used to make carbohydrates.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.09

Section: 28.04

Topic: Microbial Ecology

31. Nitrogen is

- A. an important constituent of carbohydrates.
- B. primarily fixed by fungi.
- C. turned into ammonia by microorganisms.
- D. ultimately used in making amino acids and nucleotides.
- E. turned into ammonia by microorganisms AND ultimately used in making amino acids and nucleotides.**

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

32. The nitrogen in our atmosphere is only usable to us after it is converted to

- A. ammonia.
- B. amino acids.**
- C. fertilizer.
- D. nitrous oxide.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

33. *Azotobacter*

- A. are the chief suppliers of fixed nitrogen in grasslands.
- B. form symbiotic associations with algae.
- C. have a very low respiratory rate.
- D. are methanogens.
- E. are the chief suppliers of fixed nitrogen in grasslands AND form symbiotic associations with algae.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

34. Nitrifiers

- A. are obligate anaerobes.
- B. are chemolithotrophs.
- C. convert nitrate to nitrite.
- D. are reducers.
- E. convert nitrate to nitrite AND are reducers.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

35. Sulfur occurs in all living matter primarily as a component of

- A. fatty acids.
- B. nucleotides.
- C. amino acids.
- D. carbohydrates.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

36. The sulfur cycle is similar to the cycle of

- A. carbon.
- B. oxygen.
- C. nitrogen.
- D. phosphorus.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

37. Phosphorus is a component of

- A. nucleic acids.
- B. phospholipids.
- C. nucleotides.
- D. carbohydrates.
- E. nucleic acids, phospholipids AND nucleotides.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

38. In many aquatic habitats, the growth of algae and cyanobacteria is limited by the amount of

- A. nitrogen.
- B. calcium.
- C. sulfur.
- D. phosphorus.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

39. The conical sea floor vents that spout sulfide-rich, super-heated water at temperatures up to 300°C are called

- A. yellow smokers.
- B. hydrothermal vents.**
- C. warm vents.
- D. hot vents.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.10

Section: 28.03

Topic: Microbial Ecology

40. The organisms isolated from hydrothermal vents are typically

- A. phototrophs.
- B. chemolithoautotrophs.**
- C. rhizobia.
- D. bacteroid.
- E. phototrophs, rhizobia AND bacteroid.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.10

Topic: Microbial Ecology

41. Which of the following refers to a symbiotic association between plant roots and fungi?

- A. lichens
- B. geosmins
- C. extremophile
- D. mycorrhizae**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

42. Mycorrhizae are a symbiotic association of

- A. bacteria and algae.
- B. bacteria and virus.
- C. fungi and virus.
- D.** plant roots and fungi.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

43. Truffles

A.

are ectomycorrhizas.

B. are a mushroom.

C. are a lichen.

D. form a sheath around a root of an appropriate tree.

E.

are ectomycorrhizas AND form a sheath around a root of an appropriate tree.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

44. The rumen is

- A. found in horses and rabbits.
- B. found in carnivores.
- C. an offshoot of the colon.
- D.** an anaerobic fermentation vessel found in herbivores.
- E. found in horses and rabbits AND an offshoot of the colon.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

45. Which of the following involve symbiotic relationships?

- A. rhizobia
- B. mycorrhizae
- C. ruminants
- D. myxobacteria
- E.** rhizobia, mycorrhizae AND ruminants

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

True / False Questions

46. Bacteria are the most numerous soil inhabitants, but the biomass of fungi is greater.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

47. A mycorrhizae is a symbiotic association between roots and fungi.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

48. *Streptomyces* produces geosmins which give soil a characteristic musty odor.

TRUE

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

49. Protozoa, algae, and fungus are typically found near the surface of soil.

TRUE

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

50. Fungi are able to handle acidic environments much better than bacteria.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 2. Understand

Learning Outcome: 28.06

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

51. Oligotrophic waters are usually hypoxic.

FALSE

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.07

Section: 28.03

Topic: Microbial Ecology

52. The organisms found near warm vents on the bottom of the ocean are typically chemoautotrophic.

TRUE

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.10

Section: 28.05

Topic: Microbial Ecology

53. Many orchids require fungi for seeds to germinate.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

54. No eukaryotic organisms have been shown to fix nitrogen without the aid of prokaryotes.

TRUE

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

55. Sulfur occurs in all living matter primarily as a component of proteins.

TRUE

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

Multiple Choice Questions

56. Explain how nutrient-rich runoff can cause waters to become hypoxic.

A. Algae and cyanobacteria flourish on the nutrients in the run-off. Heterotrophic microbes then flourish on the organic molecules produced by these organisms, using oxygen in the process. This consumption of oxygen leads to a hypoxic state in the area. Larger animals cannot survive in the hypoxic area.

B. Algae and cyanobacteria flourish on the nutrients in the run-off, using oxygen in the process. This consumption of oxygen leads to a hypoxic state in the area. Larger animals cannot survive in the hypoxic area.

C. The nutrients in the run-off often include chemicals that spontaneously oxidize in the presence of oxygen. As such, they tend to deplete the amount of oxygen present in an area simply by being present themselves. This consumption of oxygen leads to a hypoxic state in the area. Larger animals cannot survive in the hypoxic area.

D. It doesn't. This claim is a scare tactic used by environmental extremists to prevent farmers and individuals from fertilizing their crops and lawns. There is no induction of a hypoxic state in bodies of water where run-off occurs.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 28.09

Section: 28.05

Topic: Microbial Ecology

57. How can the biomass of fungi in soil be greater considering that bacteria are more numerous?

A. Fungi are always multicellular organisms, while bacteria are unicellular. As such, biomass of fungi would always be larger than that of bacteria, since they possess more cells in each individual organism.

B. This is a matter of size. Fungi, whether unicellular or multicellular, are eukaryotic. As such, they will generally be larger than bacteria (which are prokaryotic). This means that, even with a lower overall number, they will have more total biomass.

C. It depends on where they grow. Fungi generally grow in the most moist areas near the top of soil. This gives them an advantage over bacteria. They may not be as numerous, but this advantage in location and nutrients is what makes them larger than the bacteria (and therefore having more biomass). If the bacteria evolved to take over the top portion of the soil, THEY would have the larger biomass than the fungi.

D. Fungi are capable of incorporating the dead materials around them into themselves as nutrient sources (while bacteria are not). This capacity allows them to greatly increase their biomass per each organism, well beyond what a simple bacterial cell could hold. This capability is what allows them to achieve higher biomass than bacteria.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 28.08

Section: 28.04

Topic: Microbial Ecology

58. Gardeners sometimes plant clover between productive growing seasons. Why would this practice be beneficial?

A. Several types of nitrogen-fixing bacteria form a symbiotic relationship with the roots of clover. This would increase the amount of nitrogen in the soil available for subsequent seasons of other plants' growth.

B. Clover is consumed by a number of animals. This would encourage the animals to feed/graze on the areas, leaving behind nitrogen-rich manure that would act as a natural fertilizer for subsequent seasons of other plants' growth.

C. Clover is a unique plant that is capable of atmospheric nitrogen-fixation (pulling nitrogen directly out of the air and turning it into ammonia or amino acids). This directly provides nitrogen compounds for the soil for subsequent seasons of other plants' growth.

D. The beneficial effect is more for water retention and elimination of soil erosion in between growing seasons. It has nothing to do with nitrogen compounds in the soil.

ASM Objective: 06.01 Microbes are essential for life, as we know it, and the processes that support life (e.g. in biogeochemical cycles and plant/animal microflora).

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 5. Evaluate

Learning Outcome: 28.11

Section: 28.06

Topic: Microbial Ecology

Chapter 29 Microbial Ecology

Multiple Choice Questions

1. An effective means used early in the 19th century to clear water of the majority of bacteria was the use of

- A. chlorine.
- B. iodine.
- C. alcohol.
- D.** sand filters.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

2.

Vibrio cholerae is most often associated with

- A. breathing air.
- B. eating food.
- C.** drinking water.
- D. touching animals.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

3. The term "potable water" refers to water that is

A. safe to swim in but not drink.

B. safe to drink.

C. only good for irrigation.

D. contaminated with chemicals.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.04

Section: 29.02

Topic: Environmental Microbiology

4. A high BOD value means

A. a large amount of oxygen has been used.

B. a small amount of oxygen has been used.

C. a large amount of degradable organic matter is present.

D. a small number of viruses are present.

E. a large amount of oxygen has been used AND a large amount of degradable organic matter is present.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

5. Effective treatment of wastewater/sewage is reflected in a(n)

A. lower BOD.

B. higher BOD.

C. unchanging BOD.

D. increase in sulfur.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

6. In sewage treatment, the removal of large objects and particulate matter is achieved during
A. primary treatment.
B. secondary treatment.
C. tertiary treatment.
D. quaternary treatment.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

7. In sewage treatment, the removal of phosphates and nitrogen compounds is achieved during
A. primary treatment.
B. secondary treatment.
C. advanced treatment.
D. quaternary treatment.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

8. Advanced treatment of sewage
A. is done to prevent nutrient enrichment.
B. is done to prevent possible overproduction of algae and other organisms.
C. involves the removal of phosphates and nitrogen compounds.
D. All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

9. The activated sludge process

- A. is used during secondary treatment of sewage.
- B. is meant to convert inorganic to organic matter.
- C. is meant to increase the BOD.
- D. removes large objects from the sewage.
- E. is meant to convert inorganic to organic matter AND is meant to increase the BOD.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

10. The anaerobic organisms used in sewage treatment may produce the useful product(s)

- A. oxygen.
- B. nitrogen.
- C. carbon monoxide.
- D. methane.
- E. nitrogen AND carbon monoxide.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

11. The oxygen consuming property of a wastewater sample is designated by the term

- A. lagooning.
- B. stabilization.
- C. activation.
- D. biochemical oxygen demand.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

12. The approximate BOD value for raw sewage is

- A. 2000-7000 milligrams per milliliter.
- B. 500-800 grams per milliliter.
- C. 0-50 kilograms per milliliter.
- D.** 300-400 milligrams per liter.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

13. In which phase of sewage treatment are trickling filters sometimes used?

- A. primary treatment.
- B.** secondary treatment.
- C. tertiary treatment.
- D. quaternary treatment.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

14. Which of the following play some role in sewage treatment?

- A. activated sludge
- B. trickling filter
- C. septic tank
- D. lagooning
- E.** All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

15. The problem(s) with using sludge as a fertilizer is/are the

- A. presence of heavy metals and similar pollutants.
- B. presence of pathogenic organisms and viruses.
- C. inhibitory effect it has on plant growth.
- D. stimulatory effect it has on methane production.
- E.** presence of heavy metals and similar pollutants AND presence of pathogenic organisms and viruses.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

16. Sludge

- A. is a byproduct of sewage treatment.
- B. may be a source of pollution.
- C. takes up space in a landfill.
- D.** All of the choices are correct.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

17. Wastewater treatment decreases the amount of

- A. biodegradable carbon.
- B. ammonia and nitrate.
- C. phosphate.
- D. pathogens.
- E.** All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

18. Water treatment processes for drinking water
- A. are similar to wastewater treatment.
 - B. are only necessary when using recycled water.
 - C. includes disinfection but not filtration.
 - D.** has no biological treatment phase.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.04

Section: 29.02

Topic: Environmental Microbiology

19. Which of the following is used to cause flocculation?
- A. charcoal
 - B. methane
 - C. chlorine
 - D.** aluminum potassium phosphate (alum)

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.04

Section: 29.02

Topic: Environmental Microbiology

20. The accepted method of testing water supplies for the possible presence of pathogens is to determine the presence of
- A. *Streptococci*.
 - B.** coliforms.
 - C. *Staphylococci*.
 - D. *Streptomyces*.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.05

Section: 29.02

Topic: Environmental Microbiology

21. Coliforms are
- A. Gram-negative.
 - B. rod-shaped.
 - C. non-spore forming.
 - D. lactose-fermenting with acid and gas formation.
 - E.** All of the choices are correct.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 2. Understand

Learning Outcome: 29.05

Section: 29.02

Topic: Environmental Microbiology

22. Other microorganisms besides coliforms that have been used as indicators of fecal contamination may be
- A. *Clostridia*.
 - B. *Enterococci*.
 - C. bacteriophages.
 - D. *Bacteroides*.
 - E.** *Clostridia*, *Enterococci* AND bacteriophages.

ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

ASM Topic: Module 08 Microbiology Skills

Bloom's Level: 1. Remember

Learning Outcome: 29.05

Section: 29.02

Topic: Environmental Microbiology

23. Which of the following statements about landfills is false?
- A.** Degradation of wastes is rapid and inexpensive.
 - B. The excavated site has a plastic liner to prevent wastes from leaching into groundwater.
 - C. Recycling greatly reduces the amount of wastes sent to landfills.
 - D. Dangerous levels of methane gas can accumulate.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

24. Which of the following cannot be used in composting?

- A. grass clippings
- B. nutrient-poor potting soil
- C. meats and fats**
- D. vegetable peelings

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

25. If a compost pile is turned frequently and other conditions are adequate for aerobic digestion, the composting can be completed in

- A. 1 day.
- B. 1 month.
- C. six weeks.**
- D. six months.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

Bloom's Level: 1. Remember

Bloom's Level: 6. Create

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

26. The compost pile temperature at which pathogens, but not thermophiles, are killed is about

- A. 20-30°C.
- B. 55-66°C.**
- C. 62-75°C.
- D. 90-100°C.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

27. Bioremediation

- A. is the use of biological agents to degrade/detoxify pollutants.
- B. may involve biostimulation or bioaugmentation.
- C. has as its goal the elimination of pathogens.
- D. produces xenobiotics.
- E.** is the use of biological agents to degrade/detoxify pollutants AND may involve biostimulation or bioaugmentation.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 29.08

Section: 29.04

Topic: Environmental Microbiology

28. Pollutant degradation may be enhanced by

- A. providing sufficient moisture.
- B. providing adequate nutrients.
- C. maintaining pH near neutrality.
- D. raising the temperature.
- E.** All of the choices are correct.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

Bloom's Level: 3. Apply

Learning Outcome: 29.07

Section: 29.04

Topic: Environmental Microbiology

29. Bioaugmentation

- A.** adds specific microorganisms to the polluted site.
- B. only enhances the growth, onsite, of the resident population of microbes.
- C. usually utilizes genetically engineered bacteria.
- D. is typically done offsite.
- E. only enhances the growth, onsite, of the resident population of microbes AND usually utilizes genetically engineered bacteria.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 3. Apply

Learning Outcome: 29.08

Section: 29.04

Topic: Environmental Microbiology

True / False Questions

30. The term "potable water" refers to water that is not necessarily pure, but is safe to drink.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.01

Learning Outcome: 29.04

Section: 29.02

Topic: Environmental Microbiology

31. Zero coliforms per 100 ml of water is considered safe for treated potable water.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.05

Section: 29.02

Topic: Environmental Microbiology

32. High BOD values reflect small amounts of degradable organic matter in a sample of wastewater or other material.

FALSE

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.01

Section: 29.01

Topic: Environmental Microbiology

33. The conversion of organic to inorganic matter is called co-metabolism.

FALSE

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

34. The activated sludge method can be stopped by the presence of toxic industrial wastes.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

35. As much as 95% of BOD can be removed during secondary treatment.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

36. Trickling filters may be used in place of activated sludge in secondary sewage treatment.

TRUE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 29.02

Section: 29.01

Topic: Environmental Microbiology

37. The compost pile temperature at which pathogens, but not thermophiles, are killed is about 20-30°C.

FALSE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

38. If a compost pile is turned frequently and other conditions are adequate for aerobic digestion, the composting can be completed in 6 weeks.

TRUE

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

Multiple Choice Questions

39. Which would be more likely to cause illness-a water sample that tested positive for coliforms or one that tested positive for *E. coli* O157:H7?

A. Both would be equally capable of causing illness-all coliforms cause illness.

B. The coliform positive sample would be more likely to cause illness. Coliforms are inherently more pathogenic than the weak O157:H7 lab strain of *E. coli*.

C. The *E. coli* O157:H7 sample would be more likely to cause illness. This strain of bacterium is highly pathogenic and capable of causing kidney damage.

D. Neither-there is usually a small amount of coliforms (including *E. coli* O157:H7) in all water.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 29.05

Section: 29.02

Topic: Environmental Microbiology

40. Why would soil and water be added to a compost pile?

- A.** The organisms in the soil, along with the moisture from the water, would facilitate the natural decomposition of the material in the compost pile.
- B. Without adding soil and water, no decomposition of the material can take place. The material would simply sit there.
- C. Water is the medium that photosynthetic organisms use to break down the organic materials in the compost pile.
- D. Soil spreads out the material in the pile. If the material is too close together, natural aeration cannot occur and decomposition stops.

ASM Objective: 05.03 Microorganisms and their environment interact with and modify each other.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 29.06

Section: 29.03

Topic: Environmental Microbiology

41. Why is oil not degraded when in a natural habitat underground, yet susceptible to bioremediation in an oil spill?

- A. The high pressure the oil is subjected to underground prevents bacteria from growing and consuming it.
- B.** The bacteria can't be given the right amounts or types of nutrients to foster an increase in their number deep underground. Nearer the surface, human intervention can increase the factors that will raise the microbe quantity.
- C. The bacteria that degrade the oil require a higher than normal salt content, much like what is found in seawater. Underground, they lack this salt level.
- D. It IS degraded underground-but it happens at a much slower rate because a portion of the cycle is photosynthetic in nature. This process is dramatically increased nearer to the water's surface.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 5. Evaluate

Learning Outcome: 29.08

Section: 29.04

Topic: Environmental Microbiology

Chapter 30

Environmental Microbiology: Treatment of Water, Wastes, and Polluted Habitats

Multiple Choice Questions

1. Most large cities have required the pasteurization of milk and milk products since

- A. 1800.
- B. 1850.
- C. 1900.
- D. 1920.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

2. Human disease(s) from milk may include

- A. brucellosis.
- B. anthrax.
- C. amoebiasis.
- D. tuberculosis.
- E. brucellosis AND tuberculosis.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

3. The connection between unpasteurized milk and brucellosis in humans was made by

- A. Evans.
- B. Pasteur.
- C. Koch.
- D. Fleming.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: History of Microbiology

4. Foods that have been altered due to the carefully controlled growth of microorganisms are called

- A. cooked.
- B. controlled.
- C. preserved.
- D. fermented.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

5. Foods that have been unacceptably altered due to uncontrolled bacterial growth are called

- A. refrigerated.
- B. spoiled.
- C. preserved.
- D. fermented.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

6. Growth of pathogens in a food generally does not result in perceptible changes in the quality of the food but the ingestion of this food can result in

- A. spoilage.
- B. foodborne illness.**
- C. aging.
- D. toxin infection.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

7. The conditions normally present in food such as moisture, acidity and nutrients are referred to as

- A. extrinsic factors.
- B. intrinsic factors.**
- C. endogenous factors.
- D. exogenous factors.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

8. The growth of microorganisms in a food product is influenced by the availability of

- A. moisture.
- B. acidity.
- C. nutrients.
- D. temperature.
- E. All of the choices are correct.**

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

9. The amount of moisture available in foods is designated by the term

- A. fluid availability.
- B. water activity.**
- C. dampness quotient.
- D. aqueous usability.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

10. Pure water has a water activity value of

- A. 1.00.**
- B. 0.80.
- C. 0.70.
- D. 0.90.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

11. Which of the following foods has the greatest amount of available water?

- A. cake
- B. steak**
- C. jam
- D. syrup

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

12. For growth, most bacteria require water activity levels above

- A. 1.00.
- B. 0.80.
- C. 0.70.
- D.** 0.90.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

13. Which of the following organisms can grow at a lower water activity than most spoilage bacteria?

- A. *Pseudomonas* sp.
- B. most yeasts
- C. *Streptococcus pyogenes*
- D.** *Staphylococcus aureus*

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

14. On which of the following foods can *Staphylococcus aureus* multiply with little competition?

- A. bread
- B.** salty ham
- C. jam
- D. milk

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

15. The water activity in foods that have high levels of salt or sugar is

- A. high.
- B. dense.
- C. low.
- D. osmotic.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

16. Which of the following are most likely to be found growing on salted or dried foods?

- A. fungi
- B. bacteria
- C. viruses
- D. protozoa

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

17. Which of the following organisms may grow at pH 3.5?

- A. *Clostridium*
- B. *Streptococcus*
- C. fungi
- D. lactic acid bacteria
- E. fungi AND lactic acid bacteria

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

18. Which of the following organisms may grow at pH 2.2?

- A. *Clostridium*
- B. *Streptococcus*
- C. fungi**
- D. lactic acid bacteria
- E. fungi AND lactic acid bacteria

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

19. *Clostridium botulinum* typically does not produce its toxin under conditions that are

- A. anaerobic.
- B. alkaline.
- C. neutral.
- D. acid.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

20. Lactic acid bacteria

- A. consume lactic acid, allowing them to grow on foods such as yogurt.
- B. produce lactic acid, allowing them to produce foods such as yogurt.
- C. are important spoilage organisms.
- D. can grow on lemons.
- E. produce lactic acid, allowing them to produce foods such as yogurt AND are important spoilage organisms.**

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

21. Which of the following produce lactic acid?

- A. *Lactobacillus*
- B. *Leuconostoc*
- C. *Streptococcus*
- D. *Lactococcus*
- E.** All of the choices are correct.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

Bloom's Level: 1. Remember

Learning Outcome: 30.02

Learning Outcome: 30.06

Section: 30.02

Topic: Applied and Industrial Microbiology

22. Foods such as acidic fruits are often spoiled by

- A.** fungi.
- B. protozoans.
- C. viruses.
- D. bacteria.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

23. Most bacteria are inhibited by a pH of

- A. 7.2.
- B. 7.0.
- C. 6.0.
- D.** 4.5

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

24.

Naturally occurring antimicrobial chemicals may include

- A. benzoic acid.
- B. lysozyme.
- C. allicin.
- D. peroxidase.
- E.** All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

25. Egg white is rich in the antimicrobial

- A. lysosome.
- B. RNase.
- C. penicillin.
- D.** lysozyme.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

26. Which of the following is most likely to grow at refrigerator temperatures?

- A. mesophiles
- B.** psychrophiles
- C. thermophiles
- D. acidophiles

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

27. Limiting the activity of microbes in food can be accomplished by

- A. pasteurization.
- B. cold storage.
- C. lowering the pH.
- D. growth inhibiting substances.
- E.** All of the choices are correct.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 3. Apply

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

28. Slow cooking for a long time and then storage at room temperature would tend to favor the growth of

- A. endospore-formers.
- B. anaerobes.
- C. mesophiles.
- D. thermophiles.
- E.** endospore-formers AND mesophiles.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

29. In a cow's udder, milk

- A. contains *Lactococcus*.
- B. contains *Lactobacillus*.
- C. is acidic.
- D.** is sterile.

ASM Objective: 05.01 Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.02

Section: 30.02

Topic: Applied and Industrial Microbiology

30. Sugar is used in the making of fermented sausages to

- A. help preserve the sausage.
- B. provide raw material for the fermentation process.**
- C. sweeten the taste.
- D. counteract the action of the salt in the sausage.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 30.04

Section: 30.02

Topic: Applied and Industrial Microbiology

31. Lactic acid bacteria are used to ferment and produce foods from

- A. dairy.
- B. vegetables.
- C. meat.
- D. All of these can be fermented by lactic acid bacteria to make foods.**

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 30.02

Section: 30.02

Topic: Applied and Industrial Microbiology

32. The tart taste of yogurt, pickles and sharp cheeses is due to the presence of

- A. lactic acid.**
- B. acetic acid.
- C. sorbic acid.
- D. benzoic acid.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 30.02

Section: 30.02

Topic: Applied and Industrial Microbiology

33. The resulting solids and juices of grapes used to make wine are termed its

- A. mash.
- B. must.**
- C. germinater.
- D. malt.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 30.05

Section: 30.02

Topic: Applied and Industrial Microbiology

34. The most prevalent cause of wine spoilage is the presence of

- A. sulfur dioxide.
- B. carbon dioxide.
- C. acetic acid bacteria.**
- D. ethanol.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.05

Section: 30.02

Topic: Applied and Industrial Microbiology

35. The malolactic fermentation of wine is performed by

- A. *Lactobacillus*.
- B. *Saccharomyces*.
- C. *Leuconostoc*.**
- D. *Aspergillus*.

ASM Objective: 03.02 The metabolic abilities of a cell determine how it interacts with other cells and its environment (e.g. quorum sensing, oxygen consumption, nitrogen transformations).

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.05

Section: 30.02

Topic: Applied and Industrial Microbiology

36. The final characteristics of beer such as color, flavor, and foam primarily depend on the
A. roasted malt.
B. adjuncts.
C. wort.
D. whey.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 30.05

Section: 30.02

Topic: Applied and Industrial Microbiology

37. Soy sauce is made by fermentation of soybeans and wheat by
A. lactic acid bacteria.
B. *Saccharomyces*.
C. *Aspergillus*.
D. lactic acid bacteria AND *Saccharomyces*.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 30.06

Section: 30.02

Topic: Applied and Industrial Microbiology

38. Most human pathogens grow best at temperatures near
A. 20°C.
B. 25°C.
C. 37°C.
D. 45°C.

ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.07

Section: 30.03

Topic: Applied and Industrial Microbiology

39.

Staphylococcus aureus toxin is

- A. heat-stable.
- B. an exotoxin.
- C. an endotoxin.
- D. heat-sensitive.
- E.** heat-stable AND an exotoxin.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

40. As an added safety precaution, low-acid, home canned foods should be

- A. eaten with spoons.
- B.** boiled at least 15 minutes before consumption.
- C. frozen for 1 hour before consumption.
- D. dried prior to eating.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

41.

Clostridium botulinum toxin is

- A. heat-stable.
- B. an exotoxin.
- C. endotoxin.
- D. heat-sensitive.
- E. an exotoxin AND heat-sensitive.**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

42. The toxin of botulism is classified as a(n)

- A. enterotoxin.
- B. endotoxin.
- C. neurotoxin.**
- D. toxoid.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

43.

Which strain of *Escherichia coli* may be involved in foodborne infection?

- A. HB101
- B. M309
- C. AB220
- D. O157:H7**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

44. Which of the following is often associated with poultry products?

- A. *Salmonella*
- B. *Campylobacter*
- C. *Pseudomonas*
- D. *Lactobacillus*
- E. Salmonella AND Campylobacter**

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

45. The bacteria associated with hemolytic uremic syndrome is

- A. *Salmonella choleraesuis*.
- B. *Campylobacter jejuni*.
- C. *Pseudomonas aeruginosa*.
- D. *Lactobacillus*.
- E. *Escherichia coli* O157:H7.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

46. Irradiation of foods

- A. involves the use of gamma radiation.
- B. is used on all foodstuffs.
- C. changes the taste of foods.
- D. is not regulated by the government.
- E. involves the use of gamma radiation, changes the taste of foods AND is not regulated by the government.

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

Bloom's Level: 2. Understand

Learning Outcome: 30.03

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology

47. Single cell protein

- A. refers to the use of single-celled organisms as a protein source.
- B. refers to a single-protein produced by several different organisms.
- C. is an enzyme.
- D. causes food intoxication.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology

48. The most promising sources of single cell protein are

- A. bacteria.
- B. viruses.
- C. worms.
- D. yeasts.**

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 1. Remember

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology

True / False Questions

49. The water activity in foods with high levels of salt or sugar is high.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

50. *Lactobacillus acidophilus* can potentially colonize the intestinal tract.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

51. Yeast cannot convert grain to alcohol.

TRUE

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 2. Understand

Learning Outcome: 30.05

Section: 30.02

Topic: Applied and Industrial Microbiology

52. Aflatoxin is a potent carcinogen produced by certain bacteria.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.07

Section: 30.03

Topic: Applied and Industrial Microbiology

53. Foodborne intoxication requires the ingestion of living organisms.

FALSE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

54.

The toxin produced by *Staphylococcus aureus* is heat-stable.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

55. The bacteria associated with hemolytic uremic syndrome is *Escherichia coli* O157:H7.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 1. Remember

Learning Outcome: 30.08

Section: 30.04

Topic: Applied and Industrial Microbiology

56. Egg white is rich in the antimicrobial lysozyme.

FALSE

ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, and biological methods.

ASM Topic: Module 03 Metabolic Pathways

Bloom's Level: 1. Remember

Learning Outcome: 30.01

Section: 30.01

Topic: Applied and Industrial Microbiology

57. The most promising sources of single cell protein are bacteria.

FALSE

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

Bloom's Level: 1. Remember

Bloom's Level: 6. Create

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology

58. High concentrations of nucleic acids in the diet may lead to high levels of uric acid in the blood.

TRUE

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 2. Understand

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology

Multiple Choice Questions

59. Why would the use of a known, reliable starter culture improve the safety of fermented meat products?

- A. It doesn't. All fermented meat products are inherently unsafe since we can't determine what fermentation products are left behind in the food. Some of them may be toxic.
- B. By using pure starter cultures, we KNOW what we're adding in, and how much. We can control the microbial fermentation precisely to best prepare the food product.
- C. We need to be very careful which microbes are introduced into a food product. Some microbes can interact with microbes already present in the food, producing toxins and toxic byproducts that might harm human beings.
- D. Not every fermenting microbe ferments the same way. Even different strains of the same species might produce different products. Some of these products might not be safe for human consumption.
- E.** By using pure starter cultures, we KNOW what we're adding in, and how much. We can control the microbial fermentation precisely to best prepare the food product AND not every fermenting microbe ferments the same way. Even different strains of the same species might produce different products. Some of these products might not be safe for human consumption.

ASM Objective: 06.03 Humans utilize and harness microorganisms and their products.

ASM Topic: Module 06 Impact of Microorganisms

Bloom's Level: 5. Evaluate

Learning Outcome: 30.04

Section: 30.02

Topic: Applied and Industrial Microbiology

60. Why might a large number of competing microorganisms in a food sample result in lack of sensitivity of culture methods for detecting pathogens?

A. Many microbes secrete compounds that can be toxic for their competitors. If you need a pathogenic microbe to grow in a culture in order to detect it, these toxic compounds might inhibit the growth of the pathogen and impede the test.

B. You can't obtain a pure culture from a food sample that has a large number of microbes present. It would be impossible to detect only one from within the sample.

C. Culture methods often rely on biochemical changes taking place in medium for identification. With multiple microbes present, you may not be sure that the biochemical change observed is from the presence of a pathogen or from some other non-dangerous bacterium that also induces the biochemical change.

D. The sheer number of microbes present might shut down the growth/replication of a pathogenic microbe in a food sample due to a 'starving out' effect. If it can't grow/replicate, it won't be detectable by a culturing method test.

E. Many microbes secrete compounds that can be toxic for their competitors. If you need a pathogenic microbe to grow in a culture in order to detect it, these toxic compounds might inhibit the growth of the pathogen and impede the test AND culture methods often rely on biochemical changes taking place in medium for identification. With multiple microbes present, you may not be sure that the biochemical change observed is from the presence of a pathogen or from some other non-dangerous bacterium that also induces the biochemical change.

ASM Objective: 05.04 Microorganisms, cellular and viral, interact with both human and non-human hosts in beneficial, neutral or detrimental ways.

ASM Topic: Module 05 Systems

Bloom's Level: 5. Evaluate

Learning Outcome: 30.09

Section: 30.05

Topic: Applied and Industrial Microbiology