*Biology for a Changing World 2e,* Chapter 31 Test Bank

1. Which of the following characteristics describe viruses?

* 1. an infectious particle
	2. contain genetic material in the form of DNA or RNA
	3. have a capsid made of protein
	4. A and B only
	5. A, B, and C

Answer: E

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: viral structure, capsid, genetic material, viral characteristic

2. Is a virus alive?

*Answer:* Most scientists do not consider viruses to be alive because they cannot reproduce independently, they lack their own metabolism, and they are assembled into a complete form rather than growing and developing.

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts**:** viral characteristic

3. Viruses consist of \_\_\_\_\_\_\_\_\_.

* 1. a protein shell (capsid)
	2. genetic material in the form of DNA or RNA
	3. a cell membrane
	4. A and B only
	5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: viral structure, capsid, genetic material

4. Why isn't a virus considered alive?

1. It doesn't have any metabolic activity outside a host cell.
2. It doesn't contain any genetic material.
3. It doesn't reproduce without the host cell.
4. A and B.
5. B and C.

Answer: A

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Easy

Important Words/Concepts: viral characteristic

5. Some viruses have phospholipid membranes around them, just like living cells. They are not cells, however, because they do not contain \_\_\_\_\_\_\_\_\_.

1. structural proteins
2. nucleic acid genetic material
3. ribosomes for protein synthesis
4. A and C
5. B and C

Answer: C

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts**:** viral structure, capsid, genetic material

6. Besides using the host cell to replicate its genetic material and proteins, an infectious virus must be able to \_\_\_\_\_\_\_\_\_.

1. attach to and penetrate a host cell
2. assemble new capsid proteins
3. be released from the host cell
4. A and B
5. A, B, and C

Answer: E

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: infectious capability, capsid

7. While the protein coat of a virus allows for attachment to a host cell, the genetic material inside allows for what?

1. production of capsid proteins
2. production of release proteins
3. replication of genetic material for new viral particles
4. A and B
5. A, B, and C

Answer: E

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts:capsid, genetic material, infectious capability

8. While the genetic material of a virus allows new viral particles to be produced, the protein coat allows for what?

1. production of capsid proteins
2. attachment of the virus to the host cell
3. replication of genetic material for new viral particles
4. A and B
5. A, B, and C

Answer: B

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts: viral structure, capsid, genetic material, infectious capability

9. Explain how viruses are similar to living cells but not considered alive.

*Answer:* Viruses have genetic material and proteins, but they do not have any of the cellular “machinery” needed to carry out their own metabolic tasks nor can they reproduce on their own.

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts:viral characteristic

10. Which of the following represent the genetic material carried within a viral particle?

1. RNA
2. DNA
3. protein coat
4. A and B
5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts:capsid, genetic material

11. During \_\_\_\_\_\_\_, a virus releases its nucleic acid.

1. attachment
2. synthesis
3. degradation
4. penetration
5. integration

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts:genetic material, infectious capability, infection progression

12. Which stage of a viral infection describes the production and preparation of new viral particles that can then be released to infect other cells?

1. attachment
2. synthesis
3. assembly
4. B and C
5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: capsid, genetic material, infectious capability, infection progression

13. Viruses can replicate in a cell referred to as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell.

1. symbiotic
2. host
3. immune
4. synthesis
5. infectious

Answer: B

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts:infectious capability

14. Which of the following represents the correct order for a viral life cycle?

1. attachment, penetration, synthesis, assembly, release
2. attachment, synthesis, penetration, assembly, release
3. attachment, penetration, assembly, synthesis, release
4. attachment, penetration, assembly, synthesis, release
5. attachment, penetration, synthesis, release, assembly

Answer: A

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts:infectious capability, infection progression

15. You are at work and someone sneezes on a phone. One of your coworkers knowingly nods and tells you to avoid that phone because now it has millions of viruses breeding on it. Explain why the coworker’s statement is not biologically accurate.

*Answer:* While the coworker might be right about avoiding the phone because it is contaminated with viruses, the statement about viruses breeding on the phone is incorrect. Viruses can only reproduce inside of a living host cell.

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts: infectious capability, infection progression

16. In the attachment phase of viral infection, \_\_\_\_\_\_\_\_\_.

1. a virus attaches to the outside of the host cell surface
2. viral proteins attach to host cell DNA
3. newly built viral proteins attach to newly built viral DNA inside the host cell
4. new viral particles attach to the inside of the host cell surface
5. All of the above.

Answer: A

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts**:** infectious capability, infection progression, capsid

17. The synthesis stage of infection \_\_\_\_\_\_\_\_\_.

* 1. is the stage in which the host cell produces new viral proteins and genetic material
	2. occurs because viral genetic material takes over the host’s cellular machinery
	3. ends when new viral particles are released from the host cell
	4. A and B only
	5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: infectious capability, infection progression, genetic material

18. Viruses kill host cells by \_\_\_\_\_\_\_\_\_.

1. causing host cells to burst when new virus particles are released
2. depleting cell resources by using them to synthesize new viruses
3. releasing enzymes that break down host cell membranes
4. A and B only
5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: infectious capability, infection progression

19. All of the following can be helpful in fighting or preventing a viral infection, EXCEPT

1. interferon.
2. antibodies.
3. plasma cells.
4. saliva.
5. antibiotics.

Answer: E

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts: viral immune response to infection

20. Some viruses will only infect the cells of the respiratory tract and no other types of cells. What can you infer from this fact? Explain your reasoning.

*Answer:* Since viruses must attach by binding to receptor molecules on a host cell’s surface, it seems logical to assume that only the cells of the respiratory tract produce the proper binding proteins. Indeed, the reason that the 1918 flu was so devastating was that it bound itself specifically to cells of the lower respiratory tract—the lungs and bronchi.

DQ:What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts: infectious capability, infection progression

21. Adaptive immunity relies upon what general kinds of defenses?

1. physical barriers to prevent pathogens from entering the body
2. chemical barriers to prevent pathogens from entering the body
3. lymphocytes that set off chains of events that inactivate or destroy invading pathogens
4. A and B only
5. A, B, and C

Answer: C

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts:viral immune response to infection

22. Hemagglutinin is responsible for which phase of influenza viral life cycle?

1. attachment
2. synthesis
3. degradation
4. penetration
5. release

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts:infectious capability, infection progression, capsid

23. Neuraminidase is responsible for which phase of influenza viral life cycle?

1. attachment
2. synthesis
3. degradation
4. penetration
5. release

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts: infectious capability, infection progression, capsid

24. The severity of any viral infection is often dictated by which of the following?

1. the number of viral particles which infect the body
2. the number of cells killed during viral replication and release
3. the immune response to the infection
4. A and B
5. A, B, and C

Answer: C

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Easy

Important Words/Concepts: viral immune response to infection

25. Which of the following make viruses so infectious?

1. the ability to become aerosolized and spread in the air
2. the fact that it only takes a couple of viral particles to start an infection
3. the innate immune response
4. A and B
5. A, B, and C

Answer: D

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Use It

Difficulty: Hard

Important Words/Concepts: infectious capability, infection progression, viral immune response to infection

26. What is the time frame in which a virally infected cell releases new viral particles?

1. minutes
2. hours
3. days
4. weeks
5. immediately

Answer: B

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts:infectious capability, infection progression

27. How many new viruses will typically be released from an infected cell following synthesis and assembly?

1. 10–100
2. 1,000–10,000
3. 10,000–100,000
4. 100,000–1,000,000
5. only one viral particle is released at a time

Answer: B

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Hard

Important Words/Concepts:infectious capability, infection progression

28. Which of the following viral infections will cause bacterial cell lysis?

1. bacteroid
2. bacteriophage
3. H1N1
4. SARS
5. polio virus

Answer: B

DQ: What is the structure of a virus, and how do viruses cause disease?

Type: Know It

Difficulty: Easy

Important Words/Concepts: infectious capability, infection progression

29. \_\_\_\_\_\_ immunity is present from birth and always active.

* 1. Adaptive
	2. Humoral
	3. Cellular
	4. Innate
	5. Inflammatory

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, innate vs. adaptive immunity

30. \_\_\_\_\_\_\_ immunity provides general defense against a variety of pathogens, while \_\_\_\_\_\_\_ immunity provides defense against specific pathogens.

1. Adaptive; innate
2. Humoral; innate
3. Cellular; adaptive
4. Innate; adaptive
5. Innate; cellular

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts:innate features, innate vs. adaptive immunity

31. Innate immunity relies upon what general kinds of defenses?

1. physical barriers to prevent pathogens from entering the body
2. chemical barriers to prevent pathogens from entering the body
3. lymphocytes that set off chains of cellular and humoral that inactivate or destroy invading pathogens
4. A and B only
5. A, B, and C

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: barrier defenses, innate vs. adaptive immunity

32. Which of the following is NOT one of the four main features of innate immune function?

1. antimicrobial chemicals
2. physical barriers
3. phagocytes
4. antibodies
5. inflammation

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, innate vs. adaptive immunity

33. What is a natural killer cell?

1. any pathogen
2. a bacterial pathogen
3. the H1N1 virus
4. a modified red blood cell
5. a white blood cell that kills virally infected cells and tumor cells

Answer: E

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate cell functions, innate features, natural killer cell

34. Interferons are produced by cells infected by \_\_\_\_\_\_\_\_\_.

1. a virus
2. a bacterium
3. an animal
4. a protist
5. a fungus

Answer: A

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts:innate immune response, interferons

35. Interferons help keep cells from being infected by \_\_\_\_\_\_\_\_\_.

1. a virus
2. a bacterium
3. an animal
4. a protist
5. a fungus

Answer: A

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts:innate immune response, interferons

36. For each of the following traits of an inflamed tissue, match it with one of the following three symptoms: redness and heatwarmth, swelling, pain

*Answer:*

increased blood flow to the area – redness and heatwarmth

release of fluids and white blood cells from the leaky blood vessels – swelling

release of chemical signals from damaged tissue – pain

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate immune response, inflammation

37. Which of the following are phagocytic cells?

1. neutrophils
2. macrophages
3. natural killer cells
4. A and B
5. B and C

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate cell functions, phagocytic, innate features

38. Which of the following are antimicrobial chemicals that are considered innate immunity?

1. tears
2. stomach acid
3. saliva
4. complement
5. All of the above.

Answer: E

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts:antimicrobial chemicals, innate features

39. Name and provide one protective example of at least two innate immune system features.

*Answer:*

antimicrobial chemicals – tears, stomach acid, saliva, complement, secreted cationic proteins

physical barriers – skin, mucous membranes, tight cell junctions in the gut, hair, cilia/mucous

phagocytes – neutrophils, macrophages

inflammation – leaky blood vessels, swelling, influx of clotting factors and white blood cells

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate features, barrier defenses, antimicrobial chemicals, phagocytic, inflammation

40. Explain how inflammation is an immune response.

*Answer:* When a pathogen gets past a physical barrier, like in a cut, the damaged cells and microbes send out signals that increase blood flow to the area and attracting white blood cells. The blood vessels leak, releasing clotting factors, white blood cells, and fluid into the infected area. The white blood cells consume the pathogens and the clotting response limits the infection area.

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts:innate features, inflammation

41. Which of the following is(are) a physical barrier to infection?

* 1. skin
	2. mucus
	3. tears
	4. A and B only
	5. A, B, and C

Answer: D

DQ: What is innate immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: innate features, barrier defenses

42. Stomach acid and complement proteins are examples of \_\_\_\_\_\_\_\_\_.

1. inflammation
2. physical barriers against infection
3. antimicrobial chemicals
4. phagocytes
5. A and B only

Answer: C

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, antimicrobial chemicals, tissues of immune system

43. Phagocytes \_\_\_\_\_\_\_\_\_.

1. recognize, bind, and ingest pathogens
2. play a role in inflammation
3. trigger adaptive immune responses
4. A and B only
5. A, B, and C

Answer: E

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate cell functions, innate features, phagocytic, inflammation

44. Tears and saliva contain an enzyme that \_\_\_\_\_\_\_\_\_.

1. causes viruses to burst and die
2. coats the cell surface of bacterial cells, making them more easily found and destroyed by phagocytes
3. prevents viruses from binding to host cells, thus preventing infection
4. breaks down bacterial cell walls, causing them to burst
5. All of the above.

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, antimicrobial chemicals, tissues of immune system

45. Which of the following innate properties are indicative of an inflammatory response?

1. The response is triggered rapidly.
2. It can be triggered by many different kinds of pathogens.
3. It responds quicker after multiple exposures to the same pathogen.
4. A and B
5. A, B, and C

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate features, inflammation, innate vs. adaptive immunity

46. The inflammatory response is triggered when \_\_\_\_\_\_\_\_\_.

1. a pathogen first invades host tissue
2. phagocytes engulf pathogens
3. complement proteins destroy bacteria, releasing signaling chemicals
4. damaged cells release molecules that increase blood flow
5. clotting reactions seal off the infected area

Answer: D

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: innate features, innate immune response, inflammation

47. The heat and redness that characterize inflammation are caused by \_\_\_\_\_\_\_\_\_.

1. the initial invasion of host tissue by pathogens
2. the release of signaling molecules that increase blood flow
3. the influx of fluids from leaky blood vessels to infected tissues
4. the ingestion of pathogens by white blood cells
5. clotting reactions

Answer: C

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate immune response, inflammation, tissues of immune system

48. What is the purpose of the release of clotting factors in an inflamed tissue?

*Answer:* Clotting factors prevent the infection from spreading to the surrounding tissues and localize the effects of increased blood flow to the area of infection.

DQ: What is innate immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts:innate immune response, inflammation, clotting

49. All of the following are examples of the innate immune system, EXCEPT \_\_\_\_\_\_\_\_\_.

1. memory T cells
2. phagocytes
3. skin
4. mucus
5. complement

Answer: A

DQ: What is innate immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: innate cell functions, innate vs. adaptive immunity

50. Neutrophils are found in the \_\_\_\_\_\_\_\_\_\_\_\_\_, and macrophages are found in \_\_\_\_\_\_\_\_\_\_\_\_.

1. blood stream; tissues
2. tissues; tissues
3. blood stream; lymphatic system
4. lymphatic system; blood stream
5. Neutrophils and macrophages are both found ubiquitously.

Answer: A

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate cell functions, neutrophils, macrophages, tissues of immune system

51. Which of the following describe(s) histamine?

1. a signaling molecule released during an allergic reaction
2. a molecule that causes inflammation
3. can be released by damaged tissue during an infection
4. A and B
5. A, B, and C

Answer: E

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate immune response, allergic reaction, inflammation

52. The physical barriers that are part of the immune system function by having \_\_\_\_\_\_\_\_\_.

1. tightly packed epithelial cells that prevent pathogens from entering tissues
2. mucus that traps pathogens and other foreign substances
3. cilia that sweep mucus out of the throat
4. A and B
5. A, B, and C

Answer: E

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: innate features, barrier defenses

53. In addition to humans, innate cellular defenses are found in \_\_\_\_\_\_\_\_\_.

* 1. bacteria defending against viruses
	2. sea stars defending against bacteria
	3. fruit flies defending against parasites
	4. A and B only
	5. A, B, and C

Answer: E

DQ: What is innate immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: innate features, innate cell functions, species comparison

54. To defend against viruses, bacteria use \_\_\_\_\_\_\_\_\_.

* 1. innate physical barriers
	2. mucous membranes
	3. special enzymes
	4. special fluids
	5. acquired defenses

Answer: C

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, species comparison

55. Amoebocytes in a sea star immune function as plasmatocytes in a fruit fly. What function do these cell types have?

1. They are both innate physical barriers.
2. They are both mucous membranes.
3. They are both phagocytic cells.
4. They both are enzymes that inhibit bacterial growth.
5. There are no common characteristics between these.

Answer: C

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts:innate features, innate cell functions, species comparison, phagocytic

56. Encapsulation in fruit flies after an infection is similar to a human response to infections such as tuberculosis, which results in the formation of a \_\_\_\_\_\_\_\_\_.

1. granuloma
2. plasmatocyte
3. amoebocyte
4. lamellocyte
5. phagocyte

Answer: A

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: innate features, species comparison, tissues of immune system

57. The fact that many organisms evolved similar immune system defenses over time is evidence of the importance of what important survival requirement?

*Answer:* All species require the ability to defend themselves from invading organisms. Successful organisms have evolved similar immune defenses that allow this to occur and most of these shared defenses are innate in their characteristics.

DQ: What is innate immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: innate features, species comparison

58. What type of defense mechanism do some organisms have to protect them from predators?

1. cellular immunity
2. humoral immunity
3. adaptive immunity
4. innate defenses
5. acquired defenses

Answer: D

DQ: What is innate immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: innate features, species comparison, innate vs. adaptive immunity

59. Which type of immune response targets specific pathogens?

1. adaptive
2. humoral
3. cellular
4. innate
5. inflammatory

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive features, innate vs. adaptive immunity

60. Resistance to a particular pathogen is called \_\_\_\_\_\_\_\_\_\_\_\_\_.

1. defensiveness
2. specificity
3. immunity
4. immune signaling
5. lymphocyte proliferation

Answer:

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts:immunity, pathogen response

61. A lymphocyte is a specialized \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

1. white blood cell
2. red blood cell
3. nerve cell
4. immunocyte
5. erythrocyte

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: white blood cell, lymphocyte

62. \_\_\_\_\_\_\_\_ is a property of the adaptive immune system, which provides lasting immunity against pathogens.

1. Memory
2. Specificity
3. Barrier defenses
4. Interferon signaling
5. Lymphocyte proliferation

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: adaptive features, innate vs. adaptive immunity, memory

63. The activated B cell changes morphologically upon initiation of antibody production. It is termed a \_\_\_\_\_\_\_\_\_\_\_ because of this morphological change.

1. phagocytic cell
2. neutrophilic cell
3. plasma cell
4. cytotoxic B cell
5. productive lymphocyte

Answer: C

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, innate vs. adaptive immunity, humoral immunity, B cells

64. B and T cells wait in the \_\_\_\_\_\_\_\_ until they are needed.

1. lymphatic system
2. gall bladder
3. thymus
4. blood stream
5. bone marrow

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, tissues of immune system, B and T cells

65. B and T cells are both produced by the \_\_\_\_\_\_\_\_\_.

1. lymph nodes
2. gall bladder
3. thymus
4. spleen
5. bone marrow

Answer: E

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive cell functions, tissues of immune system, B and T cells

66. The thymus is located \_\_\_\_\_\_\_\_\_.

1. near the heart
2. under the liver
3. above the hypothalamus
4. in the medulla
5. in the brainstem

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive cell functions, tissues of immune system, T cells

67. Describe the unique features and identify the primary cell type associated with two types of adaptive immunity: humoral and cellular immunity.

*Answer:*

Humoral immunity – B cells are activated by helper T cells make antigen-specific antibodies, which can circulate and bind to antigens on specific pathogens providing protection.

Cellular immunity – Cytotoxic T lymphocytes are activated by helper T cells or phagocytic cells which have engulfed pathogens. Cytotoxic T lymphocytes can directly kill altered or infected cells in the body.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, B and T cells, humoral immunity, cellular immunity, cytotoxic T lymphocytes, helper T cells

68. Whereas B cells \_\_\_\_\_\_\_\_, T cells \_\_\_\_\_\_\_\_.

1. mature in the bone marrow; mature in the thymus
2. are produced in the bone marrow; are produced in the thymus
3. migrate to the bone marrow when mature; migrate to the thymus
4. are produced in the spleen; are produced in lymph nodes
5. are produced in lymph node; are produced in the spleen

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, B and T cells, tissues of immune system

69. When you go to the doctor with an infection, he or she may feel under your jaw or armpits or press your left abdomen and check for tenderness and swelling. Explain why your doctor would do this in terms of your immune system.

*Answer:* Centers of lymph nodes are found under your jaw and in your armpits and groin. Your spleen is in your left abdomen. B and T cells reside in the lymph nodes to detect foreign particles and pathogens in the lymph and in the spleen to detect them in the blood. During serious infections, your lymph nodes and spleen may become inflamed, swollen, and tender.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, B and T cells, tissue of immune system

70. Which of the following describe the function of antibodies in the body?

1. Antibodies can bind to antigens and physically block them from doing harm.
2. Antibodies can act as an identification signal for phagocytes to ingest pathogens.
3. Antibodies can initiate the complement proteins in the destruction of a pathogen.
4. Antibodies function purely as markers of an active adaptive response.
5. A, B, and C.

Answer: E

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts:humoral immunity, antibodies

71. Antibodies are specific for antigens. Describe two general conditions caused by the recognition of aberrant targets.

*Answer:*

Autoimmune diseases are caused by the self-reactivity of a humoral response;therefore, the immune system attacks itself.

Allergies are caused by the reactivity of a humoral response to antigens in the environment, which are responded to even if they are not pathogenic.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: humoral immunity, antibodies, allergies, autoimmunity

72. Helper T cell numbers are lowered in individuals with AIDS. Which of the following are functions of these helper T cells that may contribute to the symptoms from AIDS?

1. activation of B cells to make antibodies
2. activation of cytotoxic T lymphocytes
3. activation of neutrophils
4. increased bone marrow production of lymphocytes
5. A and B only

Answer: E

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: humoral immunity, antibodies, helper T cells, cytotoxic T lymphocytes, B cells, AIDS

73. Which of the following pathogen properties are uniquely susceptible to the advantages of the adaptive immune system over the innate immune system?

1. pathogens contain many similar characteristics
2. pathogens cannot cross barrier defenses
3. pathogens evolve quickly over time
4. A and B
5. A, B, and C

Answer: C

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: pathogen response, adaptive features, innate vs. adaptive immunity

74. The division of B cells upon activation is often referred to as clonal expansion since each B cell only recognizes one antigen with the antibody it produces. Why would it be important to maintain this clonal expansion?

*Answer:* Clonal expansion means that B cells will only recognize one antigen and the response will be specific. If the expansion included multiple clones or if the clones changed, antibodies would be produced that are no longer specific to the invading pathogen.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts:adaptive cell functions, B cells, humoral immunity, pathogen response

75. Which of the following can be targets for cytotoxic T lymphocytes?

1. cancer cells
2. virally infected cells
3. transplanted cells
4. B and C
5. A, B, and C

Answer: E

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive cell functions, cellular immunity, cytotoxic T lymphocytes, pathogen response

76. A primed immune system from a vaccine confers immunity to a particular pathogen. However, this does not mean that the pathogen cannot still bypass innate immunity. Why then is a vaccine still effective?

*Answer:* The quick and substantially larger secondary response by the adaptive immune system using memory T and B cells will not prevent the entry of the pathogen. However, it will prevent the pathogen from creating a sickness or diseased condition because of the speed and volume of the secondary response upon exposure to the pathogen.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: adaptive cell functions, pathogen response, B and T cells, adaptive features, vaccines

77. The first time we are exposed to a pathogen, we often become ill because \_\_\_\_\_\_\_\_\_.

* 1. we can’t build an immune response the first time we are exposed to a pathogen
	2. our primary immune response takes 7 to 10 days to develop
	3. our secondary immune response takes 7 to 10 days to develop
	4. our immune systems are weak
	5. A and D

Answer: B

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: adaptive features, vaccines, primary response, pathogen response

78. The second time we are exposed to a pathogen, we often do not become ill because \_\_\_\_\_\_\_\_.

1. the secondary immune response develops very rapidly
2. the secondary immune response includes the production of a much stronger antibody response than does the primary immune response
3. during the secondary immune response, antibody concentrations remain high for a long period
4. A and B only
5. A, B, and C

Answer: E

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts:adaptive features, vaccines, secondary response, pathogen response

Use the following diagram to answer Questions 79 – 83.

79. At point 1 on the diagram, \_\_\_\_\_\_\_\_\_.

1. the antibody response to pathogen A is well developed
2. the concentration of antibodies to pathogen A is very low
3. the antibody response to pathogen B is well developed
4. no antibodies are present in the blood
5. no B or T cells are present in the lymph nodes

Answer: B

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: adaptive features, vaccines, primary response, pathogen response

80. Between points 1 and 2 on the diagram, \_\_\_\_\_\_\_\_\_.

1. B and T cells are responding to antigens on pathogen B
2. memory B and T cells are being used
3. B cells are producing antibodies to pathogen A
4. A and B only
5. B and C only

Answer: C

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: adaptive features, B and T cells, vaccines, primary response, pathogen response, humoral immunity, antibodies

81. At point 2 on the diagram, \_\_\_\_\_\_\_\_\_.

1. the antibody response to pathogen A is at or near its peak
2. memory B cells for pathogen A are produced for the first time
3. memory T cells for pathogen A are produced for the first time
4. A and B only
5. A and C only

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: adaptive features, vaccines, primary response, pathogen response humoral immunity, antibodies

82. At point 3 in the diagram, \_\_\_\_\_\_\_\_\_.

1. memory B cells to pathogen A begin to divide
2. memory T cells to pathogen A begin to divide
3. memory B and T cells to pathogen B begin to divide
4. A and B only
5. A, B, and C

Answer: D

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: adaptive features, vaccines, secondary response, pathogen response, memory

83. Between points 3 and 4 in the diagram, \_\_\_\_\_\_\_\_\_.

1. the antibody response to pathogen A is much stronger than it is to pathogen B
2. the antibody response to pathogen B is much stronger than it is to pathogen A
3. antibody concentrations to pathogens A and B increase at the same rate, but the final concentration of antibodies to pathogen A is much higher than the final concentration of antibodies to pathogen B
4. the concentration of antibodies to pathogen A rises much faster than the concentration of antibodies to pathogen B, but the final concentration of both is the same
5. the antibody responses to pathogens A and B are identical

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts:adaptive features, vaccines, secondary response, pathogen response

84. People sometimes develop allergies to substances that they were not allergic to previously. This process of becoming sensitized is most similar to \_\_\_\_\_\_\_\_\_.

1. vaccination
2. inflammation
3. innate cellular defense
4. antigenic drift
5. antigenic shift

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Easy

Important Words/Concepts: adaptive features, vaccines, allergies, secondary response,

85. It is difficult to develop a universal flu vaccine because \_\_\_\_\_\_\_\_\_.

1. of antigenic shift
2. it is difficult to produce noninfectious flu viruses to provide the antigen
3. of the innate immune response
4. it is difficult to determine the source of flu strains
5. of excessive inflammatory response

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive features, vaccines, pathogen response, antigenic shift

86. If vaccination “trains” the adaptive immune system to fight off specific pathogens, why is a new flu vaccine produced every year?

*Answer:* Because of antigenic drift and shift, new strains of flu are evolving all the time, enough that memory cells will no longer recognize them. New vaccines are released each year to immunize people against the latest antigen type.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Hard

Important Words/Concepts:adaptive features, vaccines, pathogen response, antigenic shift, antigenic drift

87. You have a friend who is sure that she gets the flu from the flu vaccine and has stopped being vaccinated. How could you explain to her that it is unlikely that she got the flu from the vaccine? Can you think of two alternative reasons that she felt sick?

*Answer:* The vaccine contains dead or noninfectious virus particles. So, unless there was an error in production, there is little chance she could become truly infected from the vaccine. One possible reason she got sick is that she caught a strain of flu that wasn’t in the vaccine. Another reason is that when the adaptive immune response is reacting to the vaccine, the symptoms (fatigue, inflammation, aches) are probably going to be the same as if the adaptive immune system were responding to active viruses.

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Use It

Difficulty: Hard

Important Words/Concepts: adaptive immune response, vaccines, pathogen response, inflammation

88. During the first time a pathogen is encountered, antibody production by the adaptive immune system is \_\_\_\_\_\_\_\_\_\_; the second time, it is \_\_\_\_\_\_\_\_\_\_.

1. slow and low; fast and high
2. fast and high; slow and low
3. slow and high; fast and low
4. fast and low; slow and high
5. None of the above.

Answer: A

DQ: What is adaptive immunity, and how does vaccination rely on adaptive immunity?

Type: Know It

Difficulty: Easy

Important Words/Concepts: adaptive features, adaptive immune response, pathogen response, primary response, secondary response

89. Lethal influenza strains lead to death because \_\_\_\_\_\_\_\_\_.

1. damaged lung tissue releases molecules that begin an inflammatory response
2. macrophages release molecules that promote inflammation
3. activated T cells release molecules that promote inflammation
4. the processes in both A and B occur, leading to a greater inflammatory response than would otherwise occur
5. the processes in A, B, and C all occur, leading to a greater inflammatory response than would otherwise occur

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, influenza inflammation, innate and adaptive response

90. Most of the people who died from the 1918 flu epidemic probably died directlyfrom \_\_\_\_\_\_\_\_\_.

1. cellular damage from the replication of the flu virus
2. an enhanced immune response from lung cells
3. pneumonia cause by a second bacterial infection
4. A or B
5. B or C

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Easy

Important Words/Concepts:influenza virus mortality, influenza inflammation, secondary infections

91. Which of the following explains why one major scientific discovery that would have limited the number of deaths from the 1918 flu epidemic?

1. antiviral medications that would have treated secondary bacterial infections
2. antibiotics that would have limited the viruses ability to replicate itself
3. antibiotics that would have treated secondary bacterial infections
4. A and C
5. B and C

Answer: C

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts:influenza virus mortality, influenza inflammation, secondary infections

92. It is TRUE to say that the influenza virus \_\_\_\_\_\_\_\_\_.

1. has not had a deadly outbreak since 1918 since it was a few years before antibiotics were developed
2. has now mutated into a less aggressive form that does not cause any fatalities
3. can become lethal when it mutates into a form that can go undetected by your immune system
4. has remained a looming threat for people with compromised immune systems since it doesn't experience antigenic drift.
5. None of the above.

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, influenza inflammation, secondary infections, innate and adaptive response

93. Whereas \_\_\_\_\_\_\_\_\_\_ is gradual, \_\_\_\_\_\_\_\_\_\_ happens relatively rapidly.

1. the inflammatory response; cell-mediated immunity
2. antigenic drift; antigenic shift
3. the innate immune response; the adaptive immune response
4. A or C
5. B or C

Answer: B

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, antigenic drift, antigenic shift

94. The chance of antigenic shift is increased by \_\_\_\_\_\_\_\_\_.

1. having an autoimmune disorder
2. the adaptive immune response
3. living in too hygienic an environment
4. having allergies
5. living or working closely with animals

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, antigenic shift

95. Lethal lung viruses, such as the one responsible for the Spanish influenza, are deadly because they cause \_\_\_\_\_\_\_\_\_.

* 1. massive replication of phagocytes and activated T cells
	2. excessive blood clotting in the lung, preventing gas exchange
	3. massive inflammation in lung tissue
	4. the buildup of large viral populations in the air spaces of the lung, preventing gas exchange
	5. A and D

Answer: C

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, inflammation

96. Excessive inflammation in the lungs is potentially deadly because \_\_\_\_\_\_\_\_\_.

1. it can cause the buildup of fluid and dead cells in the air spaces of the lungs, preventing gas exchange from taking place
2. the buildup of white blood cells shuts down blood supply to the lungs; oxygen can’t enter the blood and tissues
3. dilated blood vessels collapse and can’t carry oxygen to body tissues
4. A and B only
5. A, B, and C

Answer: A

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, inflammation

97. Chemicals that promote the inflammatory response are released as a result of \_\_\_\_\_\_\_\_\_.

1. cell damage
2. the innate immune response by phagocytes
3. the adaptive immune response by T cells
4. B and C
5. A, B, and C

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, inflammation, T cells, phagocytic cells, innate and adaptive immunity

98. Explain why many people actually died of bacterial pneumonia in the 1918 flu epidemic.

*Answer:* Mucus in the respiratory system is usually useful for trapping bacteria so that they can be swept out by cilia. The excessive inflammatory response caused by the 1918 flu’s infection deep in the lungs lead to cell death, excessive fluid production, and impaired breathing. Without the ability to cough the mucus out, people with the flu were creating a good environment for bacteria in their lungs, especially since the flu was already overworking the immune system.

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, influenza inflammation, secondary infections, pandemic

99. During antigenic drift, the genes responsible for the surface antigens on virus capsids mutate, causing the antigens themselves to be different. This process can lead to a formerly harmless virus to become infectious if \_\_\_\_\_\_\_\_\_.

1. the new antigen will bind to receptor proteins on the host cells' surfaces
2. the new antigen will provide an effective way for the viruses to exit the host cells
3. the new antigen will provide the instructions for making new capsids
4. A or B
5. B or C

Answer: D

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, capsid, antigenic drift, pandemic

100. A human influenza strain and an avian (bird) influenza strain both infect a herd of swine (pigs) at the same time. In some cases, both strains infect the same cell and swap genes. This will cause \_\_\_\_\_\_\_\_\_.

* 1. the appearance of a new influenza strain with different antigens than either of the original strains
	2. a more dramatic genetic change than is normally caused by mutation and natural selection
	3. a deadly influenza pandemic
	4. A and B only
	5. A, B, and C

Answer: D

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, antigenic shift, pandemic

101. Gradual change in an influenza strain’s antigens by point mutation is \_\_\_\_\_\_\_\_\_.

* 1. caused by antigenic drift
	2. caused by antigenic shift
	3. generally responsible for annual seasonal variation in influenza
	4. generally responsible for pandemic strains of influenza
	5. A and C only

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts: influenza virus mortality, antigenic drift, pandemic

102. Most influenza pandemics are caused by the viral acquisition of alleles from which species of animal?

1. bird
2. swine
3. equine
4. domestic pets
5. reptiles

Answer: A

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: influenza virus mortality, antigenic drift, pandemic

103. How are influenza strains named, and how do the names give you information regarding the ability of a particular strain to cause an immune response?

*Answer:* Strains are named by the type or variety of hemagglutinin (H) and neuraminidase (N) that are in their protein arsenal. Each of these proteins is capable of being recognized by the immune system. Some combinations of these proteins are much more antigenic than others. Therefore, they activate a much larger immune response.

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: capsid, protein coat, influenza mortality

104. Alleles that carry new hemagglutinin and/or neuraminidase due to antigenic shift are likely to cause which of the following immune responses?

1. a slow primary immune response
2. a large secondary immune response
3. a large primary immune response
4. a slow secondary immune response
5. Neither a primary nor secondary immune response will be elicited.

Answer: A

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: capsid, protein coat, influenza mortality, primary response, adaptive features, hemagglutinin, neuraminidase, antigenic shift

105. Alleles that carry slight alterations in hemagglutinin and/or neuraminidase due to antigenic drift are likely to cause which of the following immune responses?

1. a slow primary immune response
2. a large secondary immune response
3. a large primary immune response
4. B and C
5. Neither a primary nor secondary immune response will be elicited.

Answer: B

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Easy

Important Words/Concepts: capsid, protein coat, influenza mortality, secondary response, adaptive features, hemagglutinin, neuraminidase, antigenic drift

106. Which age group(s) is(are) most susceptible to an influenza pandemic, which causes substantial inflammatory responses due to antigenic shift?

1. young individuals (younger than 10 years)
2. older individuals (older than 65 years)
3. adults with healthy and developed immune systems (20 years to 40 years)
4. A and B
5. A, B, and C

Answer: C

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: capsid, protein coat, influenza mortality, adaptive features, antigenic shift, pandemic, age

107. Which age group is most susceptible to an influenza virus that has undergone antigenic drift?

1. young individuals (younger than 10 years)
2. older individuals (older than 65 years)
3. adults with healthy and developed immune systems (20 years to 40 years)
4. A and B
5. A, B, and C

Answer: C

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts:capsid, protein coat, influenza mortality, adaptive features, antigenic drift, age

108. Which age group is most protected against an influenza virus that has undergone antigenic drift?

1. young individuals (younger than 10 years)
2. older individuals (older than 65 years)
3. adults with healthy and developed immune systems (20 years to 40 years)
4. A and B
5. A, B, and C

Answer: C

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: capsid, protein coat, influenza mortality, adaptive features, antigenic drift, age

109. Four alleles that were specific to the 1918 flu virus caused the virus to initiate a strong inflammatory response. What other change did these four new alleles allow that contributed to the extensive mortality of the 1918 flu?

*Answer:* The four new alleles allowed the virus to replicate and survive deep in the lungs. This lower respiratory placement of the inflammation led to increased mortality.

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Easy

Important Words/Concepts: alleles, influenza mortality, inflammation, antigenic shift, pandemic

110. Which of the following inflammatory responses led to the increased mortality during the 1918 flu pandemic?

1. increased blood vessel leakiness, which led to decreased oxygen absorption
2. phagocytic cell–released chemicals, which led to the death of healthy tissue
3. allergic reactions to the antibiotic medications of the period
4. A and B
5. A, B, and C

Answer: D

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: influenza mortality, inflammation, phagocytic, pandemic

111. Why is a yearly flu shot required to help prevent the symptoms of the flu?

1. to initiate a primary immune reaction
2. to help the innate immune system fight the virus
3. because small changes in the flu virus occur every year that are not recognized by the immune system
4. A and C
5. A, B, and C

Answer: D

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Easy

Important Words/Concepts:vaccine, primary response, adaptive features, antigenic drift,

112. Which of the following targets would allow scientists to develop a flu vaccine that may not have to be given every year?

1. hemagglutinin and/or neuraminidase
2. proteins which are not susceptible to changing
3. proteins that cannot be mutated because they are essential for survival of the virus
4. A and B
5. B and C

Answer: E

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Know It

Difficulty: Hard

Important Words/Concepts: capsid, protein coat, influenza mortality, adaptive features, vaccine

113. Which of the following explains why older individuals were not as affected by the 1918 flu virus as younger healthy individuals were?

1. The older generation had been exposed to similar flu viruses before and were able to mount a secondary immune response.
2. The younger generation succumbed to a increased secondary immune response leading to inflammation.
3. The older generation had a healthier innate immune system.
4. A and B
5. A, B, and C

Answer: A

DQ: What are specific features of influenza virus that allow it to cause worldwide outbreaks?

Type: Use It

Difficulty: Hard

Important Words/Concepts: age, protein coat, influenza mortality, adaptive features, secondary response, pandemic