Name:	Class:	Date:	ID: A

# Immune System Qs. Bank

**Multiple Choice** *Identify the choice that best completes the statement or answers the question.* 

 1.	Which of the following diseases can be proven t	to b	e caused by a pathogen using Koch's postulates?
	a. Syphilis	c.	Anthrax
•	b. AIDS	d.	Lyme disease
 2.	Staphylococcus aureus, a bacterium that infects workers also carry this bacterium. How would y	hur vou ( reat	nans, is present in many hospital rooms. Many health care ensure that the bacterium would not infect your patients?
	b. Clean the rooms where patients stay with g	erm	icides.
	c. Monitor waste disposal.		
	d. All of these methods would be effective in	prev	venting infection.
 3.	Substances produced by some bacteria can have	e sev	vere effects on humans. What are these substances called?
	a. Venoms	c.	Histamines
	b. Toxins	d.	Antigens
 4.	What is a disease that is constantly present in a	pop	ulation called?
	a. Epidemic	c.	Endemic
	b. Pandemic	d.	Bubonic
 5.	Which of the following symptoms is associated	wit	h the release of histamines?
	a. Redness	c.	Swelling
	b. Pain	d.	All of the above
 6.	Which of the following types of phagocytes is fo	oun	d in body tissues?
	a. Macrophages	c.	Monocytes
	b. Neutrophils	d.	Eosinophils
 7.	A cell infected with a virus produces a chemical	l tha	at diffuses to surrounding cells, resulting in the production
	of antiviral proteins. What is this chemical calle	ed?	Later former
	a. Histamine	с. d	Interferon Pesophil
0	U. rus	u.	basophil
 8.	what is a small mass of tissue that contains lym	ipno c	Lymph duct
	b Lymph rode	d.	Lymph ddet Lymph capillary
0	What are antibody producing cells called?	u.	Dymph oupmary
 9.	a Helper T cells	c	Cytotoxic T cells
	b. Plasma cells	d.	Invaders
10	What did Edward Jenner inject into an individua	al to	induce active immunity in that individual?
 10.	a. Antibodies to smallpox virus	c.	Antibodies to cowpox virus
	b. Small amounts of smallpox virus	d.	Small amounts of cowpox virus
11.	A(n) is a protein produced in response to	an	antigen.
	a. antibody	c.	macrophage
	b. complement	d.	phagocyte
12.	A reaction by tissues to any type of injury by sw	velli	ng, pain, heat, and redness is called .
	a. phagocytosis	c.	inflammation
	b. physical defense	d.	infection

#### Name: \_\_\_\_\_

 13.	. Saliva and tears contain, an enzyme that des	troys many bacteria.
	a. lysozyme c.	histamine
	b. toxin d.	complement
 14.	. The of malaria is a mosquito.	
	a. antibody c.	antigen
	b. pathogen d.	vector
 15.	. A pathogen that passes from one host to another is	said to be
	a. infectious c.	nonspecific
	b. toxic d.	specific
 16.	. Which of the following statements is one of Koch's	postulates?
	a. Pathogens must be found in the host in every c	ase of the disease.
	b. Pathogens must be grown in a pure culture.	
	c. When pathogens that are grown in a pure cultu	re are placed in a healthy host, the
	pathogens must produce symptoms of the disea	ase.
	d. all of these	
17.	. Many pathogens injure the host by producing	
	a. antibodies c.	 pus
	b. toxins d.	lysozyme
18	Koch's postulates cannot be carried out on viral dis	eases because the viruses
 10.	a do not have hosts c	cannot be grown outside of cells
	b. are not pathogens d.	are too deadly
10	Active immunity is obtained when a person is expo	sed to
 1).	a antigens	macrophages
	h injected antibodies d	antibiotics
20	A norman mith A DS is successful to all hinds of in	
 20.	. A person with AIDS is susceptible to all kinds of in	niectious diseases because HIV
	a. desiroys pathogens c.	causes an increase of antigens
0.1	b. weakens the minute system d.	causes antibody production
 21.	. HIV can be transmitted by	
	a. intimate sexual contact c.	
	b. contaminated food d.	shaking hands
 22.	. Immunity occurs when the system recognizes a fore	eign substance and responds by producing
	a. lymphocytes that make antibodies c.	toxins
	b. antigens d.	all of these
 23.	. Interferons are a body cell's defense against	
	a. all pathogens c.	viruses
	b. bacteria d.	lymphocytes
 24.	. A fever may be helpful in curing a disease because	a body temperature higher than normal
	a. makes the patient feel better	
	b. keeps the patient awake	
	c. keeps the patient from chills	
	d. interferes with the metabolism of pathogens	
 25.	. A bacterial disease becomes difficult to cure when	the bacteria
	a. die off c.	develop resistance to antibiotics
	b. make interferons d.	produce antibodies

- 26. Which of the following is part of acquired immunity?
  - a. complement c. antibodies
  - b. interferon d. lysozyme

Day	Dose	% of Pathogen Survival							
1	500 mg	80%							
2	500 mg	50%							
3	500 mg	30%							
4	500 mg	10%							
5	0 mg	15%							
6	0 mg	25%							
7	0 mg	40%							
8	0 mg	60%							
9	500 mg	55%							
10	500 mg	65%							

#### **Penicillin Treatment**

Figure 39-1

- 27. According to the data in Figure 39-1, hypothesize how the pathogen at Day 10 is different than at Day 1.
  - a. Day 1 is resistant to antibiotics c. Day 1 is lethal
  - b. Day 10 is resistant to antibiotics d. Day 10 is no longer lethal
- 28. Based on the data in Figure 39-1, why do doctors recommend taking all of a medication even if you see symptoms disappear after only a few days of treatment.
  - a. you could get a brand new infection
  - b. you will be more susceptible to other infections
  - c. you could incubate resistant pathogens
  - d. you could ultimately die
- \_\_\_\_ 29. Based on the data in Figure 39-1, how are resistant pathogens killed in your body if you had continued treatment?

c.

- a. antibiotics
- b. vaccinations d. innate immunity
- 30. According to the data in Figure 39-1, what microorganism has caused the infection?
  - a. bacteria c. fungi
  - b. virus d. protist
- \_\_\_\_\_ 31. Use the data in Figure 39-1 to predict the outcome if the antibiotic was switched from penicillin to another antibiotic and used for an entire treatment.
  - a. The infection would continue.
- c. The infection would be destroyed.

red blood cells

b. The infection would get worse. d. Other infections would occur.



- 32. In Figure 39-2, A is an example of .
  - endemic a.
  - epidemic b.
- 33. In Figure 39-2, B is an example of .
  - endemic a. c. exodemic
  - epidemic d. pandemic b.
- 34. You read a report that says that the pathogen responsible for A in Figure 39-2 is highly infective and lethal. Why is this inaccurate?

c.

d.

- it only spikes periodically a.
- it has existed for decades b. d.
- 35. A vaccine is developed for A in Figure 39-2. What will happen to the graph?
  - it will first spike, then decrease a.
  - b. the number of infections will increase
  - c. it will become an epidemic
  - the number of infections will drop to zero eventually d.
- 36. What is not present in Figure 39-3?



Figure 39-3

- a. histamine
- white blood cells b.

- c. it is a rare disease
- it is accurate

exodemic

pandemic

- pus c.
- d. antibiotics



37.	Which cell in Figure 39-4 has a nucleus?		
	a. A	c.	both
	b. B	d.	neither
38.	Which cell in Figure 39-4 destroys invaders b	y con	suming them?
	a. A	c.	both
	b. B	d.	neither
39.	Which cell in Figure 39-4 causes swelling?		
	a. A	c.	both
	b. B	d.	neither
40.	Which cell in Figure 39-4 causes pus?		
	a. A	c.	both
	b. B	d.	neither
	<ul><li>37.</li><li>38.</li><li>39.</li><li>40.</li></ul>	<ul> <li>37. Which cell in Figure 39-4 has a nucleus?</li> <li>a. A</li> <li>b. B</li> <li>38. Which cell in Figure 39-4 destroys invaders b</li> <li>a. A</li> <li>b. B</li> <li>39. Which cell in Figure 39-4 causes swelling?</li> <li>a. A</li> <li>b. B</li> <li>40. Which cell in Figure 39-4 causes pus?</li> <li>a. A</li> <li>b. B</li> </ul>	<ul> <li>37. Which cell in Figure 39-4 has a nucleus?</li> <li>a. A</li> <li>b. B</li> <li>c. b.</li> <li>b. B</li> <li>c. b.</li> <li>b. B</li> <li>d.</li> <li>38. Which cell in Figure 39-4 destroys invaders by com</li> <li>a. A</li> <li>c. b.</li> <li>b. B</li> <li>d.</li> <li>39. Which cell in Figure 39-4 causes swelling?</li> <li>a. A</li> <li>b. B</li> <li>c. b.</li> <li>b. B</li> <li>d.</li> <li>40. Which cell in Figure 39-4 causes pus?</li> <li>a. A</li> <li>b. B</li> <li>c. b.</li> <li>b. B</li> <li>c. b.</li> <li>c. b.</li> <li>d.</li> </ul>

#### Matching

Match each item with the correct statement below.

a.	pathogens	e.	lymphocyte infectious disease
b.	lymph node	f.	
c.	vaccine	g.	Koch's postulates immunity
d.	antibiotic	h.	

- 41. Weakened, dead, or parts of pathogens or antigens that, when injected into the body, cause immunity
- 42. Procedure used to determine which pathogen causes a specific disease
- \_\_\_\_\_ 43. Small mass of tissue that filters lymph
- 44. Defense against a specific pathogen by building up resistance to it
- 45. Disease-producing agents such as bacteria, protozoa, fungi, and viruses
- \_\_\_\_\_ 46. Type of white blood cell that defends the body against foreign substances
- 47. Substance produced by a microorganism that kills or inhibits the growth and reproduction of other microorganisms
- 48. Disease caused by pathogens

#### Short Answer

- 49. Compare and contrast *phagocyte* and *macrophage*.
- 50. Compare and contrast *T cell* and *B cell*.

- 51. How is interferon that is produced by genetically engineered bacteria used?
- 52. What causes a fever?
- 53. Describe three methods of pathogen transmission other than direct contact. Give an example of each.
- 54. Why is AIDS considered a disease of the immune system?
- 55. How does an antigen-antibody complex protect the body?
- 56. What role do B cells play in immunity?
- 57. How do researchers identify the specific cause of an infectious disease?
- 58. Often, when parents hear that a neighbor's child has chicken pox, they take their young children over to their neighbor's house. Why would they do this?
- 59. Organ-transplant patients are given a drug called cyclosporine to suppress the body's defenses against the transplanted organ. Why is this necessary?
- 60. Unlike earlier drugs that suppressed the entire immune system, cyclosporine does not significantly suppress the bone marrow where lymphocytes are formed. What were the dangers of taking the earlier drugs?
- 61. Antibodies produced by the body to combat the pathogen that causes rheumatic fever may begin to attack the patient's own cardiac muscle cells. How might such a mixup occur?
- 62. You get a splinter in your finger, which becomes sore and swollen. In a few days, pus forms around the splinter. Explain.

Vincent Fischetti is a professor of bacterial pathogenesis and immunology at New York's Rockefeller University. His team of researchers has been studying why some Group A streptococcal bacteria manage to slip by the defenses of the human body. Group A streptococci cause strep throat, which often leads to acute rheumatic fever, a disease that damages heart valves.

First, Fischetti's team looked at Group A streptococci under an electron microscope. They noticed that some of these bacteria have long, hairlike filaments on their surfaces. The filaments were found to consist of a protein called M protein. They decided to find out whether the M protein has anything to do with Group A's ability to resist ingestion by human phagocytes. They placed streptococci in a drop of human blood on a microscope slide. The phagocytes in the blood moved away from the bacteria that had M proteins on their surfaces. The phagocytes attacked any streptococci that lacked M-protein filaments.

- 63. How does natural selection play a role in resistance to antibiotics?
- 64. How might rapid mutation thwart the human immune response?
- 65. Having mutations in the numbers of repeated amino acid sequences in the M protein is extremely helpful to the bacteria. How might this adaptation help them to survive?
- 66. Which experiment provided evidence that the M protein protects streptococci?

### Immune System Qs. Bank Answer Section

#### **MULTIPLE CHOICE**

1. ANS: C

In order to use Koch's postulates, the pathogen must be able to be grown on pure culture. However, many pathogens, such as HIV, cannot be grown in the absence of live tissue. Anthrax was proven to be a pathogen by Koch's postulates.

PTS: 1

2. ANS: D

Infection is spread by several routes—through the air (by coughing or sneezing), by inanimate objects, and by direct touch. All of these methods would be effective in preventing the spread of the staphylococcus bacterium.

PTS: 1

3. ANS: B

Toxins are poisonous substances produced by some bacteria. They can have lethal effects on some hosts.

PTS: 1

4. ANS: C

A disease that is constantly present in a population, such as the common cold, is considered endemic to that population.

PTS: 1

5. ANS: D

Inflammation is caused by the release of histamines. It is characterized by redness, pain, swelling, and heat.

PTS: 1

6. ANS: A

Macrophages are found in body tissues. Other phagocytes, such as neutrophils, monocytes, and eosinophils, are found circulating in the bloodstream.

PTS: 1

7. ANS: C

Interferons are produced by virally infected cells. They spread to nearby cells to induce antiviral protein production.

PTS: 1

8. ANS: B

A lymph node is a small mass of tissue that contains lymphocytes and filters pathogens from the lymph fluid.

PTS: 1

9. ANS: B

Antibody immunity is mediated by B cells. In response to activation by a helper T cell, some B cells become plasma cells and produce antibodies.

PTS: 1

10. ANS: D

Edward Jenner injected a young boy with cowpox virus taken from a lesion on a milkmaid's hand. This virus induced an immune response in the boy, which later protected him from infection with smallpox virus.

	PTS: 1						
11.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
12.	ANS: C	PTS:	1	DIF:	В	OBJ:	39-4
	NAT: C3						
13.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-4
	NAT: C3						
14.	ANS: D	PTS:	1	DIF:	В	OBJ:	39-2
	NAT: C1   C6   F1				_		
15.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-2
16	NAI: $CI   C6   F1$	DTC	1	DIE	D	ODL	20.1
16.	ANS: $D$	P1S:	1	DIF:	В	ORI:	39-1
17	$\begin{array}{c} \text{NAL} C \mid C \neq \mid C \\ \text{ANS}  B \end{array}$	ρτς.	1	DIE	٨	OBI	30.3
17.	NAT: $C1 \mid C4 \mid C6$	115.	1	$D\Pi$ .	A	ODJ.	59-5
18.	ANS: C	PTS:	1	DIF:	В	OBJ:	39-1
10.	NAT: C1   C4   C6	1 1 2 1	-	2	2	0.200	0, 1
19.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
20.	ANS: B	PTS:	1	DIF:	В	OBJ:	39-6
	NAT: C4   C5   C6						
21.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-2
	NAT: C1   C6   F1				_		• • •
22.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-5
22	NAT: $CT   C5   C6$	DTC	1	DIE	D	ODL	20.4
23.	ANS: C NAT: C2	P15:	1	DIF:	В	OB1:	39-4
24	ANS: D	<b>ΡΤ</b> ς·	1	DIE	в	OBI	30_3
27.	NAT: $C1   C4   C6$	115.	1	DII .	D	ODJ.	57-5
25.	ANS: C	PTS:	1	DIF:	В	OBJ:	39-3
-	NAT: C1   C4   C6						
26.	ANS: C	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
27.	ANS: B	PTS:	1	DIF:	А	OBJ:	39-2
	NAT: C1   C6   F1						
28.	ANS: C	PTS:	1	DIF:	А	OBJ:	39-2
	NAT: C1   C6   F1						

29.	ANS: D	PTS:	1	DIF:	А	OBJ:	39-2
30.	NAT: $CI   C6   FI$ ANS: A	PTS:	1	DIF:	А	OBJ:	39-2
31.	NAT: C1   C6   F1 ANS: C	PTS:	1	DIF:	А	OBJ:	39-2
37	NAT: $C1   C6   F1$	PTS∙	1	DIE	۸	OBI	30_2
52.	NAT: C1   C6   F1	T 15.	1	DII.	A	ODJ.	5)-2
33.	ANS: B NAT: C1   C6   F1	PTS:	1	DIF:	A	OBJ:	39-2
34.	ANS: B NAT: C1   C6   F1	PTS:	1	DIF:	А	OBJ:	39-2
35.	ANS: D	PTS:	1	DIF:	А	OBJ:	39-2
36.	ANS: D	PTS:	1	DIF:	В	OBJ:	39-4
37.	ANS: C	PTS:	1	DIF:	А	OBJ:	39-4
38.	NAT: C3 ANS: A	PTS:	1	DIF:	А	OBJ:	39-4
39	NAT: C3 ANS: B	<b>PTS</b> ∙	1	DIF	Δ	OBI-	39-4
40	NAT: C3	DTC	1			ODJ.	30-4
40.	ANS: A NAT: C3	P15:	1	DIF:	A	ORI:	39-4

## MATCHING

41.	ANS: C	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
42.	ANS: G	PTS:	1	DIF:	В	OBJ:	39-1
	NAT: C1   C4   C6						
43.	ANS: B	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
44.	ANS: H	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
45.	ANS: A	PTS:	1	DIF:	В	OBJ:	39-2
	NAT: C1   C6   F1						
46.	ANS: E	PTS:	1	DIF:	В	OBJ:	39-5
	NAT: C1   C5   C6						
47.	ANS: D	PTS:	1	DIF:	В	OBJ:	39-3
	NAT: C1   C4   C6						
48.	ANS: F	PTS:	1	DIF:	В	OBJ:	39-2
	NAT: C1   C6   F1						

#### SHORT ANSWER

49.	ANS: A phag them. A	gocyte is a type A macrophage	e of wh is one	ite blood cell th type of phagoc	nat inge ytea la	sts and destroy arge phagocyte	s pathogens by surrounding and engulfing		
50.	PTS: ANS:	1	DIF:	В	OBJ:	39-4	NAT: C3		
	A T ce cells pe produc	ell is a lymphod erform differen ees antibodies v	cyte tha nt roles when ac	t is produced in in immunity. A ctivated by a T	n bone 1 A B cell cell.	marrow and pro	ocessed in the thymus gland. Different T hocyte produced in bone marrow. It		
51.	PTS: ANS:	1	DIF:	В	OBJ:	39-6	NAT: C4   C5   C6		
011	Patient	ts with a viral i ts produced by	infectio the int	n may be helpe fected cells.	ed by be	eing given addi	tional interferon above and beyond the		
52.	PTS: ANS:	1	DIF:	А	OBJ:	39-4	NAT: C3		
	Some l	bacterial toxins	s cause	the body to pro	oduce a	fever.			
53.	PTS: ANS:	1	DIF:	А	OBJ:	39-3	NAT: C1   C4   C6		
	Indirect has land that had pathog is when	et transmission ided. An exam is had the virus igen such as in a n a malaria-can	occurs ple of t sneeze moebic rrying r	when the path his mode of tra ed onto it. Wate c dysentery. Bit nosquito bites a	ogen is nsmissi er transr tes from a humar	picked up on c ion is when a p mission occurs n an animal may n.	ontact with a surface on which the pathogen erson gets the flu from touching a surface when water becomes polluted with the y also transmit a disease. An example of this		
54	PTS:	1	DIF:	А	OBJ:	39-2	NAT: C1   C6   F1		
Э <b>т</b> .	HIV, which causes AIDS, kills helper T cells that are important in developing the immune response.								
55	PTS:	1	DIF:	В	OBJ:	39-6	NAT: C4   C5   C6		
55.	The an viruses invadin	tigen-antibody and prevents ng cells.	v compl them fr	ex (1) neutraliz rom attaching to	zes bact o host c	eerial toxins by ells, or (3) fixe	blocking their active sites, (2) deactivates as complement, which leads to lysis of		
56	PTS:	1	DIF:	В	OBJ:	39-5	NAT: C1   C5   C6		
50.	A B ce antiboo	ell is activated dies bind to an	by a T tigens t	cell to produce to which they ca	antiboo an fit. T	lies, which are This binding res	released into the bloodstream. The sults in an antigen-antibody complex.		
	PTS:	1	DIF:	В	OBJ:	39-6	NAT: C4   C5   C6		

57.	ANS: (1) They host and causes th pathogen	try to find a grow it in a le disease. (4	pathog pure cu ) The p	en in the host i lture. (3) Wher pathogen must t	n every 1 they p hen be	case of the dis lace a pathogen isolated from the	ease. (2) T n from the he new ho	They isolate the pathogen from the pure culture into a healthy host, it st and shown to be the original
58.	PTS: 1 ANS: They way	nt their child	DIF:	B be exposed to the	OBJ: ne disea	39-1 ase so that they	NAT: C	1   C4   C6 uce antibodies and build up an
	active im	munity to th	e disea	se.		2	Ĩ	, And
59.	PTS: 1 ANS:		DIF:	А	OBJ:	39-5	NAT: C	1   C5   C6
	Without body wor	the cyclospo uld complete	rine, th ly rejec	ere would be a ct the organ.	n immu	ne response to	the organ	transplant. In a short time, the
60.	PTS: 1 ANS:		DIF:	А	OBJ:	39-5	NAT: C	1   C5   C6
	The dang susceptib	ger of taking ble to infectio	drugs t ous dise	hat suppressed eases.	the ent	ire immune sys	stem was t	hat the patient became highly
61.	PTS: 1 ANS:		DIF:	А	OBJ:	39-5	NAT: C	1   C5   C6
	Antibodi bind to the somethin which the	es recognize ne patient's o ng in common e body begin	and in wn car n with t s produ	itiate an immur diac muscle cel the proteins in t ucing antibodie	e respo ls, it m he rheu s that a	onse to proteins ay be because t imatic fever pa ttack its own tis	that are for the protein thogen. The ssues.	oreign to the body. If antibodies is in muscle tissue must have his could lead to a mistake by
62.	PTS: 1 ANS:		DIF:	А	OBJ:	39-5	NAT: C	1   C5   C6
	Inflamma migrate t contains	ation occurs o the infecte pus, which is	as a rea d area a s made	action to the inj and engulf larg up of dead pha	ury and e numb gocytes	l to the pathoge ers of pathoger s and body fluid	ens introdu 1s. After a ds.	iced by the splinter. Macrophages few days, the infected area
63.	PTS: 1 ANS:		DIF:	А	OBJ:	39-4	NAT: C	3
	Because	antibiotics k	ill the b	pacteria that lac	k resist	ance, only the	resistant s	trains survive and reproduce.
64.	PTS: 1 ANS:		DIF:	А	OBJ:	39-2	NAT: C	1   C6   F1
	As soon a appear, to	as the body b o which there	ouilds u e is not	ip an immune r an immune res	esponse ponse.	e to one form of	f the M pr	otein, several other mutant forms
	PTS: 1		DIF:	Α	OBJ:	39-5	NAT: C	1   C5   C6

65. ANS:

Every time the M protein changes, there is less chance that the human immune system will be able to identify and destroy the bacterium.

PTS: 1 DIF: A OBJ: 39-5 NAT: C1 | C5 | C6

66. ANS:

When streptococci are placed in a drop of blood, human phagocytes stay away from those with M protein but not from those without it.

PTS: 1 DIF: A OBJ: 39-5 NAT: C1 | C5 | C6