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Basic Immunology: Concepts for Pre-med/IB

Exam — Immunology

High-school/pre-med level questions on innate vs adaptive immunity, cells of the immune system, antibodies, vaccination, inflammation, allergy and autoimmunity.

28 items — Printable Exam

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1 Immunity is best defined as:



- A** The complete absence of microorganisms in the body
- B** The body's ability to resist and fight infection by harmful agents
- C** The ability to digest food efficiently
- D** The production of red blood cells
- E** The process of breathing oxygen

2 Which of the following is part of the BODY'S FIRST LINE of defence against infection?



- A** Antibodies in the blood
- B** Cytotoxic T cells
- C** Intact skin and mucous membranes
- D** Memory B cells
- E** Vaccination

3 Innate (nonspecific) immunity differs from adaptive (specific) immunity because innate immunity:



- A** Is present from birth and responds rapidly to many pathogens in the same way
- B** Develops only after vaccination
- C** Has memory and improves with repeated exposure
- D** Acts only against one specific type of virus
- E** Depends entirely on antibody production





4 Which of the following is primarily a component of ADAPTIVE immunity?



- A Skin barrier
- B Stomach acid
- C B lymphocytes producing antibodies
- D Phagocytic neutrophils
- E Natural killer (NK) cells

5 Which of the following cell types is BEST known for engulfing and digesting microbes (phagocytosis) as part of innate immunity?



- A B lymphocytes
- B Cytotoxic T lymphocytes
- C Neutrophils and macrophages
- D Erythrocytes
- E Platelets

6 Which statement about antibodies (immunoglobulins) is TRUE?



- A They are produced by T lymphocytes
- B They are produced by plasma cells derived from B lymphocytes
- C They are produced only before birth
- D They are enzymes that digest bacteria
- E They are lipids stored in adipose tissue





7 An antigen is best defined as:



- A Any molecule that can be recognised and specifically bound by an antibody or T cell receptor
- B Any protein made by lymphocytes
- C A special type of white blood cell
- D A chemical that always causes disease
- E A molecule that cannot be recognised by the immune system

8 Which of the following pairs is correctly matched?



- A B cells – cell-mediated immunity
- B Cytotoxic T cells – kill virus-infected cells
- C Helper T cells – produce antibodies directly
- D Macrophages – produce antibodies
- E Red blood cells – antigen presentation

9 The MAIN function of helper T cells (Th cells) is to:



- A Engulf and digest bacteria directly
- B Produce antibodies against viruses
- C Coordinate the immune response by activating B cells and other immune cells
- D Carry oxygen to tissues
- E Form blood clots





10 Which type of immunity primarily involves antibodies circulating in blood and body fluids?



- A** Cell-mediated immunity
- B** Humoral immunity
- C** Mechanical immunity
- D** Hormonal immunity
- E** Innate barrier immunity

11 Cell-mediated immunity is MOST important for defending against:



- A** Extracellular bacteria in the blood
- B** Viruses and pathogens inside host cells
- C** Physical injuries
- D** Dehydration
- E** High blood pressure

12 Which description BEST matches the inflammatory response?



- A** A specific antibody response to a single antigen
- B** A rapid, nonspecific reaction causing redness, heat, swelling and pain at a site of injury or infection
- C** A process where only T cells are activated
- D** A long-term memory response after vaccination





- E A purely psychological reaction to stress

13 Which of the following is the **BEST** description of immunological memory?



- A The ability of immune cells to store glucose
- B The ability of the immune system to respond faster and stronger to a second encounter with the same antigen
- C The storage of antibodies in the brain
- D The process of inflammation at the site of injury
- E The ability of red blood cells to remember oxygen levels

14 Which comparison between the **PRIMARY** and **SECONDARY** immune response is correct?



- A Primary response is faster and stronger than secondary
- B Secondary response is faster and produces higher antibody levels than primary
- C Primary response involves memory cells, secondary does not
- D Secondary response occurs only in innate immunity
- E Primary and secondary responses are identical

15 Vaccination (immunisation) protects mainly by:



- A Killing all bacteria in the body directly
- B Teaching red blood cells to carry more oxygen





- C Stimulating the immune system to form memory cells against a harmless form of a pathogen or its antigens
- D Creating physical barriers on the skin
- E Replacing the innate immune system

16 Which of the following is an example of **ACTIVE** immunity?



- A A baby receiving antibodies through breast milk
- B Injection of antibodies from another person or animal
- C Developing immunity after recovering from an infection
- D Antibodies crossing the placenta from mother to fetus
- E Barrier protection from skin

17 Which of the following is an example of **PASSIVE** immunity?



- A Vaccination with weakened viruses
- B Production of antibodies after chickenpox
- C Transfer of maternal antibodies across the placenta to the fetus
- D Activation of memory T cells
- E Formation of memory B cells after infection

18 Which statement about self vs non-self recognition is **MOST** accurate?





- A The immune system normally ignores the body's own cells and targets foreign molecules
- B The immune system always attacks self tissues
- C The immune system cannot distinguish between self and non-self
- D Self tolerance means the immune system never attacks any cell
- E Only innate immunity can distinguish self from non-self

19 Autoimmune diseases occur when:



- A The immune system is completely absent
- B The immune system attacks the body's own cells as if they were foreign
- C A person does not receive any vaccines
- D Only innate immunity is active
- E The body fails to produce any antibodies

20 Allergic reactions (such as hay fever or some food allergies) are best described as:



- A Normal immune responses to dangerous pathogens
- B Overreactions of the immune system to harmless substances like pollen or foods
- C Complete failure of the immune system
- D Autoimmune attacks on joints
- E Purely psychological conditions with no immune involvement





21 Which statement about immune memory after vaccination is CORRECT?



- A** Memory cells exist only during the first week after vaccination
- B** Memory cells can persist for years, allowing a rapid response to later exposure
- C** Vaccination works only if memory cells are destroyed
- D** Memory cells are red blood cells with special receptors
- E** Memory cells are only part of innate immunity

22 Which cell type can kill virus-infected or cancer cells WITHOUT recognising a specific antigen like T cells do?



- A** B lymphocytes
- B** Helper T cells
- C** Natural killer (NK) cells
- D** Platelets
- E** Erythrocytes

23 Lymph nodes are important in immunity because they:



- A** Produce red blood cells
- B** Filter lymph and provide a meeting place where antigens, antigen-presenting cells and lymphocytes interact
- C** Store only platelets
- D** Produce stomach acid
- E** Have no role in immune responses





24 Which organ is the **PRIMARY** site where T lymphocytes mature?



- A** Bone marrow
- B** Thymus
- C** Spleen
- D** Liver
- E** Kidney

25 Which organ filters blood, removes old red blood cells, and also acts as an important immune organ with many lymphocytes and macrophages?



- A** Thymus
- B** Spleen
- C** Kidney
- D** Pancreas
- E** Gallbladder

26 Which of the following statements about antibiotics and the immune system is **CORRECT**?



- A** Antibiotics directly strengthen adaptive immunity and replace the need for vaccines
- B** Antibiotics kill or inhibit bacteria, but the immune system is still needed to clear infections
- C** Antibiotics are effective against viruses in the same way as against bacteria
- D** Once antibiotics are available, immunity is unnecessary
- E** Antibiotics permanently change genetic immunity





27 Which of the following **BEST** explains why a vaccine for one disease (e.g. measles) does not protect against an unrelated disease (e.g. influenza)?



- A** Innate immunity cannot recognise viruses
- B** Vaccines only affect skin barriers
- C** Adaptive immune responses are specific to particular antigens and generate memory only against those antigens
- D** Vaccines always protect against all pathogens
- E** Antibodies are identical for all infections

28 Which person is most likely to suffer from frequent infections due to a globally **WEAKENED** immune system?



- A** Someone with a minor allergy to pollen
- B** Someone whose helper T cells are severely decreased (e.g. advanced HIV infection)
- C** Someone with only mild inflammation after injury
- D** Someone who has had a vaccine booster
- E** Someone with a single autoantibody but fully functioning T cells





#	Ans	Answer Text
1	B	The body's ability to resist and fight infection by harmful agents
2	C	Intact skin and mucous membranes
3	A	Is present from birth and responds rapidly to many pathogens in the same...
4	C	B lymphocytes producing antibodies
5	C	Neutrophils and macrophages
6	B	They are produced by plasma cells derived from B lymphocytes
7	A	Any molecule that can be recognised and specifically bound by an antibod...
8	B	Cytotoxic T cells – kill virus-infected cells
9	C	Coordinate the immune response by activating B cells and other immune ce...
10	B	Humoral immunity
11	B	Viruses and pathogens inside host cells
12	B	A rapid, nonspecific reaction causing redness, heat, swelling and pain a...
13	B	The ability of the immune system to respond faster and stronger to a sec...
14	B	Secondary response is faster and produces higher antibody levels than pr...
15	C	Stimulating the immune system to form memory cells against a harmless fo...
16	C	Developing immunity after recovering from an infection
17	C	Transfer of maternal antibodies across the placenta to the fetus
18	A	The immune system normally ignores the body's own cells and targets fore...
19	B	The immune system attacks the body's own cells as if they were foreign
20	B	Overreactions of the immune system to harmless substances like pollen or...
21	B	Memory cells can persist for years, allowing a rapid response to later e...
22	C	Natural killer (NK) cells
23	B	Filter lymph and provide a meeting place where antigens, antigen-present...
24	B	Thymus
25	B	Spleen
26	B	Antibiotics kill or inhibit bacteria, but the immune system is still nee...
27	C	Adaptive immune responses are specific to particular antigens and genera...
28	B	Someone whose helper T cells are severely decreased (e.g. advanced HIV i...

