Final immunology 2024

A 50-year-old man with a history of hepatitis C presents with generalized fatigue and jaundice. Laboratory tests show elevated liver enzymes and the presence of autoantibodies. The likely mechanism for his liver damage is:

a. Toxin-mediated liver injury

b. Direct viral cytotoxicity

c. Obstruction of bile ducts

d. Immune-mediated destruction of hepatocytes

All of the following are true of antigen EXCEPT which one of the following?

a. They will react with antibodies.

b. They contain paratopes.

c. They can elicit an immune response.

d. They contain antigenic determinants.

e. They contain epitopes.

Mark the correct role of cytosolic T-cells.

a. Proliferate T-cell

b. Produce cytotoxin

c. Kill the target cell

d. Help in B-cell activation

When a B-cell undergoes immunoglobulin class switching

a. the variable region of the heavy chain remains the same but its constant region changes

b. the variable region of the light chain remains the same, but its constant region changes

c. the variable region of the heavy chain changes but its constant region remains the same

d. the variable region of the light chain changes, but its constant region remains the same

e. both the variable and constant regions change

The major immunoglobulin family to which a particular immunoglobulin belongs can be determined by sequential analysis of the 110 amino acids beginning from the

a. Carboxy terminus of the heavy chain.

b. Amino terminus of the light chain.

c. None of the above

d. Carboxy terminus of the light chain.

e. Amino terminus of the heavy chain.

One principal function of the Class I and Class II major histocompatibility complex S proteins is to

a. stimulate production of interleukins

b. mediate immunoglobulin class switching

c. present antigen for recognition by the T-cell antigen receptor

d. bind complement

e. transduce the signal to the T-cell interior following antigen binding

Antigen processing for presentation by MHC class II molecules involves:

a. Calnexin

b. DM

c. LMP2

d. Proteasomal-mediated cleavage

e. TAP1 and TAP2

Central tolerance

a. prevents immature B cells from reacting to self, as they undergo apoptosis if exposed to membrane bound antigen within the bone marrow

b. means that in a normal individual, T cells bearing receptors for autoantigens are never present

c. none of the above is true

d. describes a state of anergy towards antigen presenting cells

e. occurs for B cells in the thymus

Which of the following compounds is NOT found in tears?

a. Lysozyme

b. IgA

c. IgE

d. Lactoferin

A 45-year-old woman presents with hyper IgM syndrome. This condition is characterized by a defect in which immunological process?

a. T cell activation

b. Complement activation

c. Antigen presentation

d. Class switch recombination

Which of the following gene clusters do not contribute to antigen binding:

a. CL

b. J

c. VH

d. VL

e. D

B lymphocytes

a. may be activated by protein and non-protein antigens

b. are the most common circulating lymphocyte

c. are activated independently of T helper cells

d. are integral to the cell mediated system of immunity

e. have a receptor for CMV virus

The cytoplasmic region of surface IgM consists of:

a. A single H chain constant region domain.

b. Carbohydrate.

c. A light chain.

d. 110 amino acids.

e. 3 amino acids.

Helper T cells (CD4+ cells) are important because they:

a. Activate B cells and cytotoxic T cells

b. Phagocytose pathogens

c. Directly kill infected cells

d. Produce antibodies

All of the following are true EXCEPT

a. An IgG antibody is bivalent

b. the variable region domains contain the antigen recognition site

c. An epitope is a small portion of a macromolecule

d. an antigenic determinant is a paratope

e. The class of an immunoglobulin is determined by its heavy chain

Concerning HIV complications

a. Toxoplasmosis is responsible for 50% of mass lesions in the CNS of HIV patients

b. Infections

c. Atypical pneumonia caused by Mycoplasma pneumoniae is one of the sentinel

d. Invasive candidiasis is commond

e. Of infected individuals will develop a malignancy 5%

Kaposi sarcoma is more common in patients who acquired the disease parenterally .f

Major Histocompatibility Complex is a tight cluster of linked_____

a. Carbohydrates.

b. Proteins

c. Lipid molecules

d. Genes

Using only random VDJ recombination, from 40 V, 30 D and 6 J gene segments, the number of possible variable regions of an antigen receptor molecule would be:

a. 7,200

b. 40

c. 76

d. 1.4 × 106

e. 1.4 × 109

Which type of vaccine contains live but weakened pathogens?

a. Subunit vaccines

b. Inactivated vaccines

c. Attenuated vaccines

d. Toxoid vaccines

A 70-year-old man receives an influenza vaccine but fails to develop immunity. Tests reveal low T cell counts. Which process was likely impaired?

a. Complement activation

b. Activation of cytotoxic T cells

c. Phagocytosis by neutrophils

d. Antibody production by B cells

If angioedema recurs without a clear cause, which of the following should be considered?

a. Emotional or psychologic triggers

b. An environmental allergy

c. Hereditary or acquired angioedema

d. An autoimmune disorder

Which type of graft is most likely to be accepted without rejection?

a. Autograft

b. Isograft

c. Allograft

d. Xenograft

Which of the following best describes the role of regulatory T cells (Tregs)?

a. They directly kill infected cells.

b. They suppress the immune response to maintain tolerance.

c. They are involved in allergic reactions.

d. They enhance the immune response.

Complement membrane attack complex can be activated by

a. IgE

b. none of the above

c. IgA

d. IgG

e. IgD

Specific antibodies are readily detectable in serum following primary contact with antigen after:

a. 3–5 weeks

b. 1 h

c. Only following a second contact with antigen

d. 10 min

e. 5–7 days

With reference to the variable Ig domain, which of these answers is false?:

a. It has a typical Ig fold with an intra-chain disulfide bond.

b. It mediates the secondary consequences of antigen recognition.

c. It has anti-parallel beta-pleated sheet structures.

d. It uses beta-turn loops to bind antigen.

e. It has an extra long beta-turn relative to constant region domains.

A discontinuous antigen epitope is

a. Produced by a continuous linear peptide sequence

b. Representative of only a minority of B-cell epitopes

c. Usually concave

d. Produced by amino acid residues on non-adjacent polypeptide sequences

e. Presented by MHC molecules

Coreceptor CD3 is used to bind antigen.

a. False

b. True

The ability of an organism to resist infections by the pathogens is called_____

a. Allergy

b. Hypersensitivity

c. Infection

d. Immunity

All the individual of the same species has the same allele of MHC genes.

a. False

b. True

A researcher is performing an ELISA test to measure the amount of a specific antibody in a ? patient's blood. Which of the following is crucial for the test's specificity

a. The temperature of the reaction.

b. The use of specific secondary antibodies.

c. The amount of blood sample used.

d. The presence of antigen in the test.

The process by which B cells produce different classes of antibodies during an immune response is known as:

a. Affinity maturation

b. Isotype switching

c. Class switch recombination

d. Somatic hypermutation

A patient with a viral infection shows an increase in interferon production. The primary role of interferon in this context is to:

a. Enhance antigen presentation to T cells

b. Activate B cells

c. Stimulate antibody production

d. Neutralize the virus directly

The major role of the complement system is to work in conjunction with

a. Antibodies to lyse cells via the perforin molecules .

b. Antibodies to opsonize cells.

c. The major histocompatibility complex for cell recognition.

d. Antibodies to lyse cells via the C8 and C9 components .

e. The T-cell receptor for production of lymphokines.

Natural killer cells

a. are leukocytes

b. unlike other cells of the immune system, do not produce cytokines

c. have the ability to kill a cell without prior sensitisation

d. are a predominant cell in adaptive immunity

e. kill cells that over-express class I MHC molecules, such as tumour cells

Hepatitis is an example of _____.

a. Recombinant Vaccine

b. Subunit Vaccine

c. Killer Vaccine

d. Toxoids Vaccine

An example of secondary mediators released by Mast cells would be

a. Tryptase.

b. Platelet activating factor.

c. Heparin .

d. Histamine .

e. Chymase .

A patient is diagnosed with multiple myeloma, a condition characterized by excessive production of a single type of antibody. Which of the following is most likely affected?

a. Monoclonal antibody production

b. Immune response to multiple pathogens

c. Complement activation

d. Antigen diversity

The processing of cytosolic protein involves:

a. Binding to the MHC class II groove.

b. Proteasome-mediated cleavage.

c. Displacement of beta2-microglobulin.

d. Transport into late endosomes.

e. Displacement of invariant chain.

Individuals unable to make the J protein found in certain immunoglobulins would be expected to have frequent infections of the

a. blood.

b. pancreas.

c. brain.

d. liver.

B lymphocytes

a. have a receptor for CMV virus

b. are integral to the cell mediated system of immunity

c. are the most common circulating lymphocyte

d. may be activated by protein and non-protein antigens

e. are activated independently of T helper cells

Regarding the immune system

a. *cell mediated immunity provides defence against intracellular organisms*
b. *diverse receptors on lymphocytes show that they are inherently specific for a particular microbe*
c. *NK cells play a pivotal role in cell mediated immunity*
d. *humoral immunity is part of the innate immune response*
e. *T lymphocytes make up 30% of circulating lymphocytes*

Name the part of processed antigen that binds to the MHC molecule and recognized by T-cells?

a. *Epitope*
b. *Agretope*
c. *Immunoglobulin*
d. *Chaperone*

Receptor editing:

a. *Has been described for antibody but not TCR.*
b. *Can involve V genes which are 3' of the initially selected V gene.*
c. *Involves the S (switch) sequences.*
d. *Is associated with reexpression of RAG-1 in germinal centers.*
e. *For B-cells only occurs in bone marrow.*

A researcher wants to measure cytokine levels in a patient's blood sample. Which technique should they use?

a. *Western blot*
b. *ELISA*
c. *Flow cytometry*
d. *PCR*

Which of the following cells has a high affinity receptor for IgE?

a. *Dendritic cell*
b. *Mast cells*

c. *Eosinophils*

d. *Basophils*

Where does the acquired immune response begin for circulating antigens?

a. *Mucosa-associated lymphoid tissues*

b. *Langerhans dendritic cells*

c. *The spleen*

d. *Regional lymph nodes*

IgM:

a. *Has the same number of constant domains as IgG.*

b. *Is the main class of the 'natural antibodies'.*

c. *Is a weak bacterial agglutinator.*

d. *Is most commonly tetrameric.*

e. *Is usually of high affinity.*

The T-cell receptor genes were originally identified using:

a. *A liver DNA gene library.*

b. *In situ hybridization.*

c. *Subtractive hybridization.*

d. *The polymerase chain reaction.*

e. *monoclonal anti-idiotype*

The process by which B cells produce different classes of antibodies during an immune response is known as:

a. *Class switch recombination*

b. *Affinity maturation*

c. *Somatic hypermutation*

d. *Isotype switching*

A 25-year-old woman with a history of autoimmune disease is found to have high levels of autoreactive antibodies. This is indicative of a failure in which immune tolerance mechanism?

a. *Peripheral tolerance*
b. *Complement regulation*
c. *Immune privilege*
d. *Central tolerance*

In the adaptive immune response, CD8+ T cells are primarily responsible for:

a. *Producing cytokines*
b. *Activating B cells*
c. *Secreting antibodies*
d. *Killing infected host cells*

Regarding mast cells, which statement is false

a. *They can be activated by IL-8*
b. *They can degranulate with exposure to C5a*
c. *They are activated with cross linking of high affinity IgE Fc receptors*
d. *They can degranulate with exposure to morphine*
e. *Basophils are similar to mast cells, but are in much higher concentrations in certain tissues (eg the lung)*

A researcher uses flow cytometry to analyse a patient's immune cells. Which of the following can be measured with this technique?

a. *Surface markers on individual immune cells*
b. *Antibody levels in the blood*
c. *Gene expression in T cells*
d. *Cytokine secretion profiles*

The process by which B cells produce different classes of antibodies during an immune response is known as:

a. *Somatic hypermutation*
b. *Affinity maturation*
c. *Class switch recombination*
d. *Isotype switching*

The processed peptide binding to the MHC class I groove:

a. *Is usually more than 11 amino acids long.*
b. *Hangs over the ends of the groove.*
c. *Is derived from exogenous protein taken in by endocytosis.*
d. *Is mainly recognized by the CDR2 of the T-cell receptor chains.*
e. *Usually binds to the groove through 2 anchor residues*

Regarding the proportion of circulating lymphocytes

a. *none of the above figures is correct*
b. *neutrophils make up 90%*
c. *Plasma cells make up 50%*
d. *the T cell make up 60-70%*
e. *the B cell make up 50%*

Which of the following immunity is obtained during a lifetime?

a. *Both Active and Passive Immunity*
b. *Innate immunity*
c. *Passive immunity*
d. *Active immunity*

The common disorders caused by a poor immune system include _____

a. *Epidemic Diseases*
b. *Autoimmune diseases*

c. *None of the above*
d. *Deficiency diseases*

Immunological unresponsiveness to self antigens is called:

a. *ADCC*
b. *Tolerance*
c. *Tolerogen*
d. *Memory*
e. *Acquired immunity*

T-cell receptors or antibodies react with antigens

a. *cause histamine release*
b. *facilitate perforin release*
c. *because both are made by lymphocytes*
d. *because both 'have light chain and heavy chain polypeptides*
e. *because of complementary of molecular fit of both with antigen*

Which of the following is a common trigger of anaphylaxis?

a. *Bacterial infection*
b. *Bee sting* 
c. *Tuberculosis infection*
d. *Pollen exposure*

Regarding the immune system

a. *The classical pathway of complement activation is part of adaptive immunity*
b. *C reactive protein is a by-product of various adaptive immunity responses*
c. *antibodies play a crucial role in the innate immune system*
d. *complement activation*
e. *mannose binding lectins are released by microbes, and are important for*

f. *none of the above is true*

In systemic anaphylaxis

a. *hives are not a feature*
b. *a previous history of some form of allergy is always present*
c. *the symptoms usually follow administration of foreign proteins*
d. *the severity of the response is proportional to the concentration of the antigen*
e. *there is widespread oedema, but the larynx is spared*

A 40-year-old man with asthma is prescribed an inhaler containing a corticosteroid. This medication helps manage his symptoms by:

a. *Enhancing mucus production*
b. *Blocking histamine release*
c. *Neutralizing allergens*
d. *Reducing inflammation in the airways*

Name the nerve stimulator which is responsible for the pain of the inflammation.

a. *Histamines*
b. *Prostaglandin*
c. *Bradikinins*
d. *Kinins*

The purpose of a vaccine is to:

a. *Inhibit the growth of bacteria*
b. *Neutralize toxins directly*
c. *Stimulate an immune response without causing disease*
d. *Provide passive immunity by transferring antibodies*

In type III hypersensitivity reaction,

a. *small or intermediate size antigen-antibody complexes are more likely to cause this disease process*
b. *phase 2 begins a week after exposure to antigen*
c. *phase 3 begins approximately 10 days after exposure to the antigen*
d. *all of the above is true*
e. *wherever the complexes deposit, the tissue damage is similar*

A 60-year-old man with chronic liver disease has low levels of complement proteins. This deficiency would most affect which function of the immune system?

a. *Activation of T cells*
b. *Opsonization of pathogens*
c. *Antibody production*
d. *Neutralization of toxins*

Immunohistochemistry is used to:

a. *Amplify DNA sequences*
b. *Stain tissues for the presence of specific proteins*
c. *Measure cytokine levels in blood*
d. *Separate proteins by size*

The position of immune cells in the spleen is

a. *B cells in the paracortical regions of the white pulp*
b. *Neutrophils cells in the medullary cords*
c. *B cells in the perifollicular regions of the white pulp*
d. *T cells in the medullary cords*
e. *Macrophages in the paracortical regions of the white pulp*

Which part of the antibody interacts with immune cells via Fc receptors?

a. *Hypervariable region*
b. *Constant region*

c. *Fab region*

d. *Light chain*

Who discovered the structure of immunoglobulin by treating it with beta-mercaptoethanol?

a. *Nisonoff*

b. *Whittekar*

c. *Edelman*

d. *Porter*

Regarding hypersensitivity reactions

a. *Type III hypersensitivity is generally due to reactions against endogenous antigens*

b. *In type III hypersensitivity, immune complexes are typically deposited in vessel walls*

c. *Pemphigus vulgaris is an example of complement-mediated inflammation*

d. *the presence of antibody-antigen complexes in the circulation implies disease*

e. *The TH1-type helper cell promotes the synthesis of IgE in type I hypersensitivity reactions*

The major role of the complement system is to work in conjunction with

a. *antibodies to lyse cells via the C8 and C9 components*

b. *antibodies to opsonize cells*

c. *the T-cell receptor for production of lymphokines*

d. *antibodies to lyse cells via the perforin molecules*

e. *the major histocompatibility complex for cell recognition*

B-cells and T-cells are two types of cells involved in _____.

a. *Passive immunity*

b. *Active immunity*

c. *Innate Immunity*

d. *Acquired immunity*

Name the molecule which constitutively expressed on the dendritic cell?

a. *Class I MHC*
b. *Antigen*
c. *APC*
d. *Class II MHC*

A 60-year-old man undergoes a kidney transplant. Three months later, he develops signs of kidney failure. A biopsy shows dense lymphocytic infiltrates in the graft. This is most likely due to:

a. *Chronic rejection*
b. *Hyperacute rejection*
c. *Graft-versus-host disease (GVHD)*
d. *Acute rejection*

Name the dendritic cell, which does not function as antigen presenting cell?

a. *Langerhans cell*
b. *Myeloid dendritic cell*
c. *Follicular dendritic cell*
d. *Lymphoid dendritic cell*

A patient with type 1 diabetes mellitus has antibodies against pancreatic beta cells. This condition is an example of:

a. *Type IV hypersensitivity*
b. *Type III hypersensitivity*
c. *Type I hypersensitivity*
d. *Type II hypersensitivity*

Which of the following cells do NOT participate in innate immunity?

a. *Phagocytic cells*
b. *T cells*
c. *Natural killer cells*
d. *Polymorphonuclear leukocytes*

A patient with HIV is found to have a significantly reduced CD4+ T cell count. This primarily impairs which aspect of the immune response?

a. *Phagocytosis by neutrophils*
b. *Complement activation*
c. *Activation of macrophages and cytotoxic T cells*
d. *Antibody production*

All of the following are true EXCEPT

a. *An epitope is a small portion of a macromolecule*
b. *The class of an immunoglobulin is determined by its heavy chain*
c. *the variable region domains contain the antigen recognition site*
d. *An IgG antibody is bivalent*
e. *an antigenic determinant is a paratope*

A 30-year-old man has recurrent bacterial infections despite being vaccinated. Laboratory tests reveal a lack of antibodies in his serum. Which cell type is likely deficient?

a. *B cells*
b. *Dendritic cells*
c. *Macrophages*
d. *T cells*

Neutrophil defensins are:

a. *Enzymes.*
b. *Anti-toxins.*
c. *Glycolipids.*
d. *Peptide antibiotics.*
e. *Oxygen-dependent.*

All of the following are true about antibodies, EXCEPT which one?

a. *They are glycoproteins.*
b. *They predominate the primary immune response to antigen.*

c. *They are molecule with a single, defined amino acid sequence.*
d. *They occur on the surface of B-lymphocyte*
e. *They fix complement.*

A patient with a weakened immune system is advised against receiving certain vaccines. Which type of vaccine is likely contraindicated?

a. *Inactivated vaccines*
b. *Conjugate vaccines*
c. *Subunit vaccines*
d. *Live attenuated vaccines*

Recombination of V, D and J Ig gene segments:

a. *Only occurs in mature B-cells.*
b. *Does not occur until the mRNA stage.*
c. *Is effected by recombinase enzymes.*
d. *Involves heptamer-spacer-heptamer flanking sequences.*
e. *Only occurs in light chains*

The complementarity determining regions:

a. *Are restricted to light chains.*
b. *Bind to Fc receptors.*
c. *Are concerned in antigen recognition.*
d. *Are in the constant part of the Ig molecule.*
e. *Occur at the C-terminal end of the Ig peptide chains*

Somatic hypermutation of V genes:

a. *Involves heavy but not light chain immunoglobulin V genes.*
b. *Is commonly seen for both antibody and TCR.*
c. *Is confined to the hypervariable regions.*
d. *Does not occur in IgM antibodies.*

e. *Can decrease the affinity of an antibody.*

Where does the acquired immune response begin for circulating antigens?

a. *Langerhans dendritic cells*
b. *Mucosa-associated lymphoid tissues*
c. *Regional lymph nodes*
d. *The spleen*

A laboratory is testing for the presence of viral RNA in a patient's sample. Which technique is most appropriate?

a. *Polymerase chain reaction (PCR)*
b. *Flow cytometry*
c. *Immunofluorescence*
d. *Western blotting*

Chediak-Higashi syndrome is caused due to deficiency of_____

a. *Nutrophils*
b. *Mast cell*
c. *Basophils*
d. *Nk cells*

A 55-year-old woman with chronic granulomatous disease (CGD) is at increased risk for infections due to:

a. *Defective complement activation*
b. *Impaired T cell function*
c. *Defective antibody production*
d. *Impaired phagocytosis*

Name the syndrome occurs in children due to deficiency of the thymus.

a. *Acromegaly*
b. *Gigantism*
c. *DiGeorge syndrome*
d. *Cushing syndrome*

T cells

a. *receptor recognises a very limited number of peptides*
b. *are activated by soluble antigen*
c. *CD8 molecules bind to the class II MHC molecules*
d. *with the γδTCR recognise peptides and lipids without the need for antigen presentation*
e. *have a receptor for antigen (TCR) that is made up of α, β, and γ subunits*

Which of the following conveys the longest-lasting immunity to an infectious agent?

a. *Both (a) and (b)*
b. *Passive immunity*
c. *Active immunity*
d. *None of the above*

A hapten is:

a. *A paratope.*
b. *A carrier.*
c. *An epitope.*
d. *A small chemical grouping which reacts with preformed antibodies.*
e. *An immunogen.*

Which of the following cells has a high affinity receptor for IgE?

a. *Eosinophils*
b. *Basophils*
c. *Mast cells*

d. *Dendritic cell*

A patient is receiving immunosuppressive therapy after a heart transplant. Which aspect of the immune response is most targeted by this treatment?

a. *Antibody production by B cells*
b. *Phagocytosis by neutrophils*
c. *Complement activation*
d. *T cell activation and proliferation*

Which cytokine is crucial for the differentiation of naïve T cells into Th17 cells?

a. *IL-12*
b. *IL-23*
c. *IL-4*
d. *IL-2*

In a laboratory study, Western blotting is used to detect specific proteins in a patient's serum. This technique relies on:

a. *ELISA*
b. *Antigen-antibody interactions*
c. *DNA sequencing*
d. *Flow cytometry*

Examples of primary mediators released by Mast cells would be

a. *Prostaglandin D2*
b. *Leukotrienes*
c. *Cytokines.*
d. *Heparin.*
e. *Platelet activating factor .*

Which of the following immunoglobulins present normally in plasma at the highest concentration

a. *IgE*
b. *IgM*
c. *IgG*
d. *none of the above*
e. *IgA*

A patient receives a penicillin injection and develops anaphylaxis. This severe reaction is due to which hypersensitivity mechanism?

a. *Type IV hypersensitivity*
b. *Type II hypersensitivity*
c. *Type I hypersensitivity*
d. *Type III hypersensitivity*

Neutrophils, basophil, lymphocytes, eosinophil and monocytes are examples of _____.

a. *Cellular barriers*
b. *Physical barrier*
c. *Physiological barriers*
d. *Cytokine barriers*

Name the part of processed antigen that binds to the MHC molecule and recognized by T-cells?

a. *Immunoglobulin*
b. *Epitope*
c. *Agretope*
d. *Chaperone*

A patient presents with recurrent infections and is found to have a defect in phagocytosis Which of the following conditions is most likely:-

a. *DiGeorge syndrome*
b. *Chronic granulomatous disease (CGD)*

c. *Wiskott-Aldrich syndrome*

d. *X-linked agammaglobulinemia*

A 30-year-old woman with a bacterial infection shows an increased number of macrophages at the site of infection. Which cytokine is most likely responsible for this recruitment

a. *Interferon-gamma (IFN-y)*

b. *Tumour necrosis factor-alpha (TNF-a)*

c. *Interleukin-10 (IL-10)*

d. *Interleukin-4 (IL-4)*

A patient develops a red, itchy rash after using a new lotion. This is an example of

a. *Type I hypersensitivity*

b. *Type Il hypersensitivity*

c. *Type Ill hypersensitivity*

d. *Type IV hypersensitivity*

A patient with a history of multiple blood transfusions develops fever, chills, and urticaria after receiving another transfusion.This reaction is most likely due to

a. *Acute hemolytic transfusion reaction (Type Il)*

b. *Delayed hemolytic transfusion reaction (Type III)*

c. *Anaphylactic transfusion reaction (Type I)*

d. *Febrile non-hemolytic transfusion reaction (Type IV)*

The mononuclear phagocyte system does not include

a. *Kidney mesangial cells*

b. *Monocytes*

c. *Lymph node medullary macrophages*

d. *Kupffer cells*

e. *Endothelial cells*

Pattern recognition receptors (PRR) include

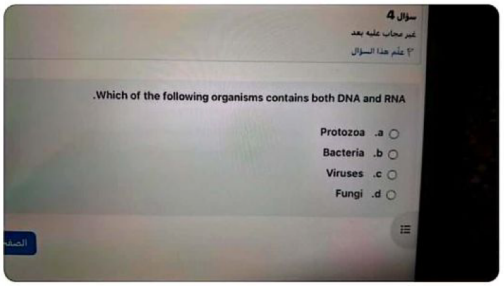
a. *Unmethylated CpG sequences*
b. *Lectin-like molecules*
c. *PAMPs*
d. *LPS*
e. *Lipoteichoic acid*

A patient with systemic lupus erythematosus (SLE) develops kidney damage due to immune complex deposition. Which type of hypersensitivity is involved

a. *Type Ill hypersensitivity*
b. *Type I hypersensitivity*
c. *Type IV hypersensitivity*
d. *Type Il hypersensitivity*

Chediak-Higashi syndrome is caused due to deficiency of_____

a. *Basophils*
b. *Nk cells*
c. *Mast cell*
d. *Nutrophils*



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