

Immunology Interview Questions And Answers Guide.



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Immunology Job Interview Preparation Guide.

Question # 1

Give the classification of hypersensitivity?

Answer:-

Hypersensitivity is classified into five types-

- * 1. Anaphylaxis
- * 2. Antibody dependant cytotoxicity
- * 3. Immune complex mediated diseases
- * 4. Delayed type 'o' cell mediated hypersensitivity
- * 5. Stimulatory hypersensitivity

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Question # 2

What is anaphylaxis?

Answer:-

It is most rapid hypersensitive reaction. It responds within minutes of applying a stimulus and can get localize. Reactions are mediated by release of pharmacologically active substances.

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Question # 3

What is hypersensitivity?

Answer:-

The inflammatory response produced by inflammatory molecules result in tissue damage and some times even death. We call this as hypersensitivity or allergy.

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Question # 4

What is delayed hypersensitivity?

Answer:-

We can recognize the Symptoms only days after exposure. This is delayed hypersensitivity (DTH).

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Question # 5

What is a myeloma protein?

Answer:-

It is a monoclonal immunoglobulin produced from a myeloma cell.

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Question # 6

What is opsonin?

Answer:-

Opsonin is a substance, which promotes phagocytosis of antigens by binding to them.

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Question # 7

What is an incomplete antibody?

Answer:-



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Antibody can bind to an antigen but cannot induce agglutination is called incomplete antibody.

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Question # 8

What are iccosomes?

Answer:-

The particles coated with immune complexes and are released from follicular dendritic cell extensions, are called as iccosomes.

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Question # 9

Name the scientists who classified hypersensitivity.

Answer:-

Coombs and Gell

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Question # 10

What are hypersensitive reactions?

Answer:-

If humoral or cellular immunity is switch on to high for length of time, tissue damage may occur. Such reactions are called hypersensitive reactions.

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Question # 11

What is auto immunity?

Answer:-

Disease caused by immunological reaction to self-antigen. Such type of diseases is classified either organ specific or non-organ specific.

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Question # 12

Name some of the immuno suppressive agents.

Answer:-

- * Cytotoxic agents such as chlorambucil, cyclophosphamide, and azathioprine
- * Glucocorticoids
- * Cyclosporine
- * Antilymphocyte antibodies

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Question # 13

What is immuno suppression?

Answer:-

Immuno suppression is particularly given to the patients who are undergoing organ transplantation in the treatment of autoimmunity, graft rejection and in allergy conditions.

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Question # 14

What are the types in adjuvants?

Answer:-

- * 1. Organic adjuvants
- * 2. Synthetic adjuvants
- * 3. Tuftsin

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Question # 15

What is an adjuvant?

Answer:-

Adjuvant potentates the immune response Vaccines need to be enhanced by some substances, these substances are called adjuvants.

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Question # 16

What is vaccination?

Answer:-

Vaccination means exploiting the immune system to protect against infectious diseases. Vaccination is done to protect against lethal diseases such as mumps, rubella, poliomyelitis, diphtheria, tetanus, small pox etc.



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Question # 17

What is attenuation?

Answer:-

Natural behavior of an organism without causing disease is called attenuation i.e. reducing pathogenesis of the organism.

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Question # 18

What is secondary immune response?

Answer:-

Secondary immune response occurs when second exposure to the same antigen occurs after weeks, months or after years.

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Question # 19

What is inductive or latent period?

Answer:-

After immunogen is introduced no antibody is detected, this is latent or inductive period. In this period, immunogen is recognized as a foreign substance.

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Question # 20

What is primary immune response?

Answer:-

First exposure to an antigen produces primary immune response.

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Question # 21

What is a binder?

Answer:-

The binding protein (usually antibody) which binds to the ligand is called as binder.

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Question # 22

What is an analyte or ligand?

Answer:-

The substance whose concentration is to be determined is called as an analyte or ligand.

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Question # 23

What is importance of radio immuno assay?

Answer:-

It is the most sensitive technique used for detecting antigen or antibody. This type of reaction is also called as binder ligand assay.

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Question # 24

In radio immuno assay what is the used to label an antigen?

Answer:-

In this technique, the antigen is generally labeled with α - emitting isotopes such as I125.

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Question # 25

What is radio immuno assay?

Answer:-

It is a competitive binding assay in which fixed amount of antibody and radiolabelled antigen react in the presence of unlabelled antigen.

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Question # 26

What is western blotting?

Answer:-



Identification of specific protein in a complex mixture of proteins can be accomplished by a technique that is known as western blotting.

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Question # 27

What are the enzymes used for labeling of antibodies?

Answer:-

Enzymes used for labeling of antibodies are horseradish peroxidase, alkaline phosphatase, β -galactosidase, lacto peroxidase, etc.

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Question # 28

What is the significance of indirect ELISA?

Answer:-

It is used for the detection of the presence of serum antibodies against immuno deficiency virus (HIV, the causative agent of AIDS).

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Question # 29

In how many ways ELISA can be carried out.

Answer:-

It can be carried out in three ways.

Indirect ELISA
Sand witch ELISA
Competitive ELISA

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Question # 30

What is the significance of ELISA?

Answer:-

It is used for the detection and for identification of either antigen or antibody.

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Question # 31

Name two enzymes that have been employed for ELISA.

Answer:-

1. Alkaline, phosphatase, horseradish, peroxidase
2. Para nitro phenyl phosphatase

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Question # 32

What is the basic principle of ELISA?

Answer:-

The basic principle is an enzyme conjugated to an antibody reacts with a colorless substrate to generate a colored product.

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Question # 33

What is the full form of ELISA?

Answer:-

Enzyme Linked Immuno Sorbant Assay.

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Question # 34

What are the uses of indirect immuno fluorescence?

Answer:-

1. For identifying bacterial species
2. Detecting antigen-antibody complexes in autoimmune diseases
3. Detecting complement components in tissues.
4. Localizing hormones

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Question # 35

What are the advantages of indirect immuno fluorescence?

Answer:-

The primary does not need to be conjugated with label.



It increases the sensitivity of staining because multiple fluorochrome reagents will bind to each antibody molecule. This method has great flexibility.

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Question # 36

What is indirect immuno fluorescence?

Answer:-

In a method the primary unlabelled antibody is detected with a number of reagents have been developed for indirect staining. The most common is fluorescence labeled anti isotype antibody such as fluorescein labeled goat- mouse antibody.

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Question # 37

What is the disadvantage of direct immuno fluorescence?

Answer:-

A separate fluorescent conjugate have to be prepared against each antigen to be tested.

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Question # 38

What is direct immuno fluorescence?

Answer:-

In this method, the species antibodies are primary antibodies, which are directly conjugated to fluorescent dye.

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Question # 39

Into how many types is immuno fluorescence is divided?

Answer:-

Immuno fluorescence is divided into 2 types-

1. Direct immuno fluorescence
2. Indirect immuno fluorescence

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Question # 40

What are the most commonly used fluorescent dyes?

Answer:-

The most commonly used fluorescent dyes are fluorescein or rhodamine. Both dyes can be conjugated to Fc region of antibody without affecting the specificity of the antigen.

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Question # 41

What is immuno fluorescence?

Answer:-

Fluorescence is the property of absorbing light ray of particular wavelength and emitting rays in different wavelength.

Antigens that are bound to cells or tissue sections can be visualized by tagging the antibody molecule with a fluorescent dye or fluorochrome.

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Question # 42

Give application of counter current immuno electrophoresis

Answer:-

This technique is applied to detect the antibody against hepatitis-B and to detect antibodies against SLE (systemic leupus erythromotosis) and used to detect specific antigen foe- meningococcus in cerebrospinal fluid.

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Question # 43

What is counter current immuno electrophoresis?

Answer:-

This technique involves the simultaneous electrophoresis of antigen and antibody in the gel in the opposite direction resulting in precipitation of point where there is optimum concentration of antigen-antibody.

This method produces visible precipitin with in 30 minutes and is 10 times more sensitive than the standard double diffusion technique.

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Question # 44

Give some applications of immuno electrophoresis.



Answer:-

1. This technique is useful for testing normal and abnormal proteins in serum and urine.
2. It is useful to determine whether a patient produces abnormally a low amount of one or more proteins.
3. It is also used if a patient over produces some serum proteins.

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Question # 45

How is immuno electrophoresis more advance than paper electrophoresis?

Answer:-

In paper electrophoresis, serum proteins can be separated into 5 different bands but the same protein using immuno electrophoresis can be separated into 30 different proteins.

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Question # 46

What is immuno electrophoresis?

Answer:-

The resolving power of immuno diffusion was greatly enhanced by immuno electrophoresis. This involves the electrophoretic separation of antigen into its constituent proteins followed by immuno diffusion.

This technique is performed on 1% agarose gel. Antigen mixture is first electrophorized and separated based on charge, troughs are then cut in the agarose gel, and antiserum is added to the troughs.

The agarose gel is then incubated 18-24hrs during which the antigen and antibody diffuse towards each other. The formation of precipitin bands can be observed for the individual antigen components.

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Question # 47

What is double immuno diffusion method?

Answer:-

In this method, both antigens and antibodies diffuse radially from wells towards each other by establishing a concentration gradient. As equivalence is reached, a visible line of precipitation is observed.

The patterns of precipitin lines that are formed when two different antigens are placed in adjacent wells indicate whether they share any common epitope or not.

Identity occurs when two antigens share identical epitopes; hence, the line of precipitation formed by them will fuse to give single curve line of identity.

Non-identity occurs when two antigens are unrelated. The antiserum form independent precipitin lines that cross each other.

Partial identity occurs when two antigens share common epitope. The antiserum forms line of identity with the common epitope and a curved spur with the unique epitope.

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Question # 48

What is the limitation for radial immuno diffusion method?

Answer:-

This method cannot the antigens present in concentration below 5-10 micro grams/ml.

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Question # 49

What is radial immuno diffusion method?

Answer:-

It is used to qualitate the antigen. Suitable dilution of antiserum is incorporated in the agar gel. Antigen is added to the wells cut on the surface of the gel. As the antigen diffuses into the agar region, equivalence is established and ring of precipitation is formed. The area of precipitin ring is directly proportional to the concentration of antigen. By comparing the area of precipitin with a standard curve obtained by measuring the precipitin area of known concentration of antigen, the concentration of antigen in the given sample can be determined.

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Question # 50

Name the two-immuno diffusion techniques.

Answer:-

* Radial immuno diffusion method and

* Double immuno diffusion in two dimensions

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Question # 51

What are immuno diffusion reactions?

Answer:-

These reactions can be used to determine relative concentrations of antigens and antibodies to compare antigens and to determine the relative purity of an antigen. They are mainly performed in 1% agarose gels.

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Question # 52

What are the applications of precipitation reactions?

Answer:-

1. Precipitation reaction is the basic reaction for a number of techniques.
2. It is less sensitive for detecting antibodies.
3. Precipitation reactions in gels have several advantages rather than in liquid medium.
4. They have forensic application in identification of blood and seminal stains.

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Question # 53

What is zone of equivalence?

Answer:-

In this, ratio of antigen-antibody is seen optimal which results in large multimolecular lattice, hence maximum precipitation is observed.

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Question # 54

What is zone of antibody excess?

Answer:-

In this, the first available antigen is completely filled by antibody molecules. Hence, no antigenic determinant is left out free. Unreacted antibody is seen in large amount, hence poor lattice formation.

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Question # 55

What are the three distinct phases that a precipitation shows?

Answer:-

The three distinct phases are
Ascending part called 'zone of antibody excess'.
A peak called 'zone of equivalence'.
A descending part called 'zone of antigen excess'.

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Question # 56

Give the mechanism of precipitation.

Answer:-

Marrak proposed the lattice hypothesis to explain the mechanism of precipitation.
The amount of precipitate formed is greatly influenced by relative proportions of antigens and antibodies.
The valency of antigens is multivalent.
When antigen-antibody is in optimal concentration, the precipitation is complete. So that, large lattice is formed.

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Question # 57

Briefly describe about precipitation reaction.

Answer:-

When a soluble antigen combines with corresponding antibody in the presence of electrolyte at a suitable temperature and pH, the antigen-antibody complex forms an insoluble precipitate. Antibodies that form precipitate are called precipitans.

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Question # 58

Into how many types is antigen-antibody reactions are broadly classified?

Answer:-

It is broadly classified into five-

1. Precipitation
2. Agglutination
3. Complement fixation
4. Immunoassay using labeled reagents
5. Immunohistochemistry (Immunofluorescence)

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Question # 59

What is horseman antigen?

Answer:-

The glycolipid antigens are present in most tissues of guinea pigs but not in the RBC. They are found in gastrointestinal mucosa in some people. This horseman antigen will not induce antibody formation.

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**Question # 60**

What are heterophile antigens?

Answer:-

Heterophile antigens are polysaccharides, which are structurally similar because of their limited complexity. They are derived from members of widely separated taxonomic groups.

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Question # 61

Give an example of cross-reaction.

Answer:-

Cross reactivity is often observed in polysaccharide antigens that contain similar oligosaccharide residue. A, B, O blood group antigens - These are glycoprotein expressed on RBC.

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Question # 62

What is a cross-reaction?

Answer:-

Antigen-antibody reactions are specific, but in some cases antibody elicited by one antigen can cross react with another antigen. This reaction is called as cross-reaction and the antigen that produces cross-reaction is called as cross-reactive antigen. Cross-reaction is due to the presence of two or more antigenic determinants on the related antigen.

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Question # 63

What is avidity?

Answer:-

The capacity of an antiserum containing various antibodies to combine with the whole antigen is called avidity. Thus, avidity is used to denote the overall capacity of an antibody to combine with multivalent antigen.

A multivalent antigen has many types of antigenic determinants, when this is injected into the blood each antigenic determinant stimulate the production of particular antibody.

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Question # 64

What is affinity of an antibody?

Answer:-

The strength of binding of an antibody to a monovalent antigen or single antigenic determinant is called affinity of an antibody.

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Question # 65

Explain in brief about Vander Val interactions in antigen-antibody interaction.

Answer:-

Temporary transfer of electrons from one molecule to another will result in the force of attraction between them. This is seen when the interacting molecules come close to each other.

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Question # 66

Explain in brief about hydrophobic interactions in antigen-antibody interaction.

Answer:-

Contribute up to 50% of the total strength of antigen- antibody interactions. These reactions are found when ever the side chains of non-polar amino acids of antigen-antibody come together.

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Question # 67

Explain in brief about hydrogen bonds antigen-antibody interaction.

Answer:-

Reversible hydrogen bonds are formed between hydrophilic groups such as hydroxyl, amino and carboxylic group. Although hydrogen bonds are relatively weak, they play an important role in interaction of antigen-antibody.

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Question # 68

Explain in brief about electrostatic bonds in antigen-antibody interaction.

Answer:-

These are formed due to the attraction between opposite charged protein side chains.



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Question # 69

What are the forces that are responsible for antigen-antibody reactions?

Answer:-

The process that holds antigen-antibody together is called non-specific interactions. Inter molecular forces may be classified into four-

1. Electrostatic bonds
2. Hydrogen bonds
3. Hydrophobic interactions
4. Vander Val interactions

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Question # 70

What is a paratope?

Answer:-

The portion of the antibody molecule that binds to the epitope is called as paratope. Epitope and paratope determine the specificity of immunological reactions.

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Question # 71

What is an epitope?

Answer:-

The smallest unit of antigenicity is known as antigenic determinant or epitope.

The part of the antigen at which the antibody reacts is known as epitope or antigenic determinant.

It is a small area possessing specific chemical structure and stereo configuration on the antigen capable of sensitizing on immuno site and of reacting with its complimentary site on the specific antibody.

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Question # 72

What is antigenic specificity?

Answer:-

Antigen antibody reaction is specific and specificity is determined by special configuration of antigenic determine.

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Question # 73

Give some general features of antigen-antibody interaction.

Answer:-

1. The reaction is specific and antigen combines only with its corresponding antibody and vice versa.
2. Entire molecules react but not the fragment.
3. There is no denaturation of antigen or antibody during the reaction.
4. The combination of antigen - antibody is firm but reversible. The firmness of the reaction is influenced by the affinity and avidity of the reaction.
5. Both antigens and antibodies participate in the formation of agglutination and precipitation reactions.
6. Antigens and antibodies can combine in various proportions unlike chemicals with fixed valency.

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Question # 74

What is an antigen and antibody interaction?

Answer:-

Antigen-antibody interaction is similar to an enzyme substrate interaction. The reaction between antigen and antibody occurs in two stages. Primary stage is the initial interaction of antigen-antibody without any visible effect .The reaction is rapid and obeys the general law of thermodynamics and physical chemistry.

The primary stage is followed by the secondary stage leading to demonstrate events such as precipitation, lysis of cells, neutralization of toxins and fixation of compliments etc.

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Question # 75

Briefly describe about dosage and route of administration, which make a substance antigenic.

Answer:-

Combination of optical dosage and routes of administration will induce a peak immune response in a given animal. An insufficient dose will not stimulate an immune response. An excessive dose does not give a peak immune response because it causes a state of immunological unresponsiveness or non-response known as immunological tolerance.

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Question # 76

Briefly, describe about the foreignness of a molecule, which makes a substance antigenic?

Answer:-



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To be antigenic macromolecules must come from foreign source. Antigens from related species are less antigenic than that of unrelated species. More distance the antigen source the better is the antigenicity.

Ex: Plant proteins are good antigens in animals, where as duck serum proteins are not good antigens for chick.

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Question # 77

Briefly describe about the chemical nature of the molecule, which make a substance antigenic.

Answer:-

Most naturally, occurring antigens are proteins and polysaccharides. Lipids and nucleic acids are less antigenic. The antigenic property of these compounds is enhanced by combination with proteins.

Certain degree of structural complexity is required for antigenicity. Synthetic polymers are macromolecules in size are not antigenic because they lack structural complexity. Ex: Gelatin

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Question # 78

Briefly describe about size of a molecule, which make a substance antigenic.

Answer:-

Molecule size of an antigen has a direct relation to antigenicity. Very large molecules such as haemocyanin (6.7 million Daltons) and thymoglobulin (669 kd) are highly antigenic where as low molecular weight compounds whose molecular weight is less than 10,000 Daltons are poor antigenic. Ex: Insulin and histones

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Question # 79

What are the factors that influence immunogenicity?

Answer:-

A number of factors have been identified which make a substance antigenic. They are -

- * Size
- * Chemical nature
- * Susceptibility to tissue enzymes
- * Foreignness
- * Immunogen dose and route of administration

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Question # 80

Give an example for hapten molecule.

Answer:-

Small molecules such as DNP (Dinitro phenyl), M-amino benzene sulphonate by themselves are not immunogenic. However, when they conjugate with a protein such as Bovine serum Albumin (BSA), they can act as complete antigens.

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Question # 81

What are haptens?

Answer:-

Haptens are small molecules that can react specifically with antibodies but cannot initiate immune response by themselves. They have property of antigenicity, but lack immunogenicity.

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Question # 82

What is cell-mediated immune response?

Answer:-

It is based on T cells. These T cells are of two types.

- T helper cells (TH)
- T cytotoxic cells. (TC)

T helper cells interact with antigen MCH II present on APC (Antigen presenting cell) and secrete cytokines. These activate B cells, Tc cells and other phagocytic cells; these activated phagocytic cells kill microorganisms like protozoa and bacteria.

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Question # 83

What is humoral immune response?

Answer:-

It is based on antibodies. It is conferred to non-immune individuals by administration of serum antibodies from an immune individual. Antibodies bind to the antigens and facilitate their elimination by forming clusters through cross-linking.

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Question # 84

What is immunogenicity?



Answer:-

The ability of a material to induce an immune response is referred to as immunogenicity.

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Question # 85

Into how many types is immune response divided?

Answer:-

Immune response is divided into two types

1. Humoral immune response
2. Cell mediated immune response.

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Question # 86

What is an immunogen?

Answer:-

The ability of a material to induce immune responses referred as immunogenicity and such material is known as an immunogen.

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Question # 87

What is antigenicity?

Answer:-

The ability of an antigen to combine specifically with the final products of immune response is called as antigenicity.

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Question # 88

What is an antigen?

Answer:-

A substance that can produce a specific immune response when it is introduced into the animals and that can react specifically with the products of immune response is generally known as an antigen.

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Question # 89

What is opsonisation?

Answer:-

Immunoglobulins specific for particulate antigens such as bacteria play an important role by coating the surface of the bacteria and making the antigen more susceptible for phagocytosis. This process is called as opsonisation.

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Question # 90

What is Secondary IgA?

Answer:-

It is a dimer of molecular weight of 400,000 Daltons and sedimentation coefficient of 11S.

It contains a glycin rich polypeptide called a secretory component or secretory piece. It is relatively resistant to digestive enzymes and reducing enzymes. It is believed to play an important role in local immunity against respiratory and intestinal pathogens.

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Question # 91

What is serum IgA?

Answer:-

It is a monomer. It has a molecular weight of 160,000 Daltons and sedimentation coefficient of 7S.

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Question # 92

Give the classification of IgA.

Answer:-

IgA occurs in two forms.

- * Serum IgA
- * Secondary IgA

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Question # 93

Give the classification of IgG.



Answer:-

IgG is again sub divided in 4 sub classes. They are

1. IgG 1
2. IgG 2
3. IgG 3
4. IgG 4

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Question # 94

Briefly describe immunoglobulin M.

Answer:-

- 1) It constitutes 5.8% of total immunoglobulins. It has a normal serum level of 0.5 to 2 mg/ml.
- 2) It is a pentamer having a molecular weight of 900,000 Daltons and has a sedimentation coefficient of 19S. It is phylogenetically oldest immunoglobulin.
- 3) It has a half-life of about 5 days.
- 4) 5 monomers are arranged with their Fc fragments in the centre of the pentamer and the antigen binding sites towards the periphery of the molecule.
- 5) It is the first immunoglobulin to be synthesized by the foetus beginning by about 20 weeks of age.
- 6) It is 500-1000 times more effective than IgG in opsonization.
- 7) It particularly gives protection against microorganisms and other larger antigens that have repeating antigenic determinants on their surface.

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Question # 95

Define immunoglobulin D

Answer:-

- * Molecular weight of IgD is 185,000 Daltons and has a sedimentation coefficient of 7S.
- * Its concentration in serum is about 3 mg/100ml, which constitutes about 0.2% of total Ig.
- * It is mostly intra vascular in distribution.
- * Its half-life is about 3 days.
- * It is rich in carbohydrates.
- * IgD along with IgM occurs on the surface of unstimulated or mature B cells and serves as a reorganization receptor for antigens.
- * No biological effect or function has been identified for IgD.

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Question # 96

Briefly describe immunoglobulin (Ig) E.

Answer:-

- 1) It is a monomer having a molecular weight of about 200,000 Daltons and has a sedimentation coefficient of 8S.
- 2) Its half life is about 2 days
- 3) Its concentration in serum is very low i.e. 0.3 mg/ml.
- 4) It exhibits unique property such as heat lability and affinity for the surface of tissue cells such as mast cells.
- 5) It does not pass the placental barrier.
- 6) It is chiefly produced in the linings of respiratory and intestinal tracks.
- 7) It is responsible for the anaphylactic type of hypersensitivity.
- 8) The physiological role of IgE appears to be protection against pathogens by mast cells degranulation and release of inflammatory mediators.
- 9) Interleukin fold enhances the secretion of IgE.

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Question # 97

Briefly describe Immunoglobulin (Ig) A.

Answer:-

- 1) It is the second most abundant class containing 10-13% of serum immunoglobulins.
- 2) It has a half-life of 6-8 days.
- 3) IgA is actively secreted by mucosal associated lymphoid tissue (MALT).
- 4) Its molecular weight is 60,000 Daltons.
- 5) IgA is synthesized locally by plasma cells and dimerized intra-cellular before secretion, with the help of cysteine rich polypeptide, called the J chain, which has a molecular weight of 15,000. IgA functions by inhibiting the adherence of coated microorganisms to the surface of mucosal cells.

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Question # 98

Briefly describe Immunoglobulin (Ig) G.

Answer:-

- 1) This is the major serum Ig containing 75% of the total serum immunoglobulin concentration.
- 2) It has a molecular weight of 150,000 Daltons and sedimentation coefficient is seven.
- 3) Its half-life is approximately 23 days.
- 4) It is the Ig, which is normally transported across the placenta and provides natural passive immunity to the newborn
- 5) It participates in immunological reactions such as complement fixation, precipitation, and neutralization of toxins and viruses.
- 6) It is secreted in large amounts during secondary immune response.

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Question # 99



What are isotypes?

Answer:-

IgG, IgA, IgM, IgD, IgE classes are variants of immunoglobulin molecule. They are termed as isotypic variants or isotypes.

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Question # 100

How immunoglobulins are measured?

Answer:-

Immunoglobulins are measured using sedimentation coefficient (measured by Svedberg) or 'S' value.

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Question # 101

Give the classification of immunoglobulin molecules.

Answer:-

Immunoglobulins are classified into 5 different types. They are

- 1) IgG
- 2) IgA
- 3) IgM
- 4) IgD
- 5) IgE

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Question # 102

The area of the H chain, which is between CH1 and CH2 domain, is called as _____.

Answer:-

Hinge region. It is rich in Proline and second highest amino acid cysteine.

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Question # 103

What are the domains, which are present in heavy chain?

Answer:-

Heavy chain contains one variable domain (VH) and either 3 or 4 constant domains (CH1, CH2, CH3, and CH4).

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Question # 104

What are the domains, which are present in the light chain?

Answer:-

Light chain contains one variable domain (VL) and one constant domain (CH).

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Question # 105

Name the scientists who elucidated the basic structure of immunoglobulin.

Answer:-

Rodney Porter and Gerald Edelman

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Question # 106

Name the bond linking the two heavy chains

Answer:-

1-2 disulphide bonds

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Question # 107

Name the bond linking L chain and H chain.

Answer:-

Disulphide bond

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Question # 108

What are immunoglobulins?

Answer:-



Immunoglobulins are glycoproteins, each molecule containing two pairs of polypeptide chains of different sizes, smaller ones are called light chains (L), and larger ones are called heavy chains (H).

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Question # 109

What are basophils?

Answer:-

They are found in blood and in tissues. They contain several hydrolytic enzymes and amines like histamine, serotonin etc.

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Question # 110

What are oesophils?

Answer:-

They are found in large number in allergic inflammatory actions and in parasitic infections.

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Question # 111

What are neutrophils?

Answer:-

They are most abundant leucocytes. Constitute 60 - 75% of blood leucocytes. They are active in phagocytosis.

[Read More Answers.](#)

Question # 112

What are microphages?

Answer:-

Neutrophils, oesophils, basophils are called as microphages.

[Read More Answers.](#)

Question # 113

What are dendritic cells?

Answer:-

Cells, which help in presentation of antigen to cell during primary immune response, are dendritic cells. They have no phagocytic activity and are highly polymorphic. They are present in peripheral lymphoidal organs particularly and in the germinal centers of spleen and lymph nodes.

[Read More Answers.](#)

Question # 114

Macrophages, which are present in the lungs, are called as.

Answer:-

Macrophages, which are present in the lungs, are called as Alveolar Macrophages.

[Read More Answers.](#)

Question # 115

Macrophages, which are present in the brain, are called as.

Answer:-

Macrophages, which are present in the brain, are called as Microglia.

[Read More Answers.](#)

Question # 116

Macrophages, which are present in the liver, are called as.

Answer:-

Macrophages, which are present in the liver, are called as Kupffer cells

[Read More Answers.](#)

Question # 117

Macrophages, which are present in the connective tissue, are called as.

Answer:-

Macrophages, which are present in the connective tissue, are called as Histiocytes.

[Read More Answers.](#)

Question # 118



Immature macrophages, which are present in the blood stream, are called as.

Answer:-

Immature macrophages, which are present in the blood stream, are called as Monocytes.

[Read More Answers.](#)

Question # 119

What are phagocytic cells (macrophages)?

Answer:-

All macrophages originate from bone marrow stem cells in the form of monoblast, which develop into promonocytes and monocytes. Monocytes enter the blood and their half-life in the blood is about 3 days. Later they enter into the tissues and develop into macrophages.

[Read More Answers.](#)

Question # 120

What are natural killer cells?

Answer:-

These are large granulated lymphocytes possess spontaneous cytotoxicity towards various target cells mainly the malignant cells and virus infected cells. Their cytotoxicity is not antibody dependant. They bind to glycoprotein receptor of target cells and release cytolytic factor.

[Read More Answers.](#)

Question # 121

Give the classification of null cells.

Answer:-

Null cells are classified into three types.

1. Natural killer cells
2. Antibody dependant cellular cytotoxic cells
3. Lymphokine activated killer cells.

[Read More Answers.](#)

Question # 122

What are null cells?

Answer:-

The lymphocytes that are devoid of markers for T and B- cells are called null cells.

[Read More Answers.](#)

Question # 123

What are TH- cells?

Answer:-

T helper cells (TH) will recognize the antigen when it is presented by antigen presenting cell along with MHC class - II complex. They secrete various cytokines activate B - cells Tc cells and a variety of cells that participate in the immune response.

[Read More Answers.](#)

Question # 124

What is the life span of a plasma cell?

Answer:-

The life span of a plasma cell is 2 - 3 days.

[Read More Answers.](#)

Question # 125

What are plasma cells?

Answer:-

They are antibody-secreting cells. They are oval in shape and twice the size of small lymphocytes, with a centrally placed oval nucleus containing large blocks of chromatin located peripherally.

[Read More Answers.](#)

Question # 126

What is B - lymphocyte?

Answer:-

They derive from bone marrow stem cells. Their development and maturation takes place in bone marrow. Matured B-cells leave the bone marrow and migrate via blood stream to the secondary lymphoid organs.

[Read More Answers.](#)

Question # 127



Give the classification of lymphocytes

Answer:-

They are classified into two types.

T- lymphocytes: derived from thymus

B - lymphocytes: derived from bone marrow

[Read More Answers.](#)

Question # 128

What are lymphocytes?

Answer:-

They are the central cells of immune system responsible for acquired immunity, diversity, specificity, memory, self and non-self recognition.

Lymphocytes are small, round cells found in peripheral blood, lymph, lymphoid organs and in many tissues.

[Read More Answers.](#)

Question # 129

What is haematopoiesis?

Answer:-

Formation and development of red and white blood cells from stem cell is called haematopoiesis.

[Read More Answers.](#)

Question # 130

What is bursa of fabricius?

Answer:-

It is a lympho epithelial organ arising as a pouch from the dorsal part of the cloacae in birds. Its development, structure, and function are parallel to those of thymus.

In birds, it is the primary site of B-cells maturation.

[Read More Answers.](#)

Question # 131

What are T- cells?

Answer:-

Lymphocytes produced in the thymus are called as T-cells or thymus dependant lymphocytes.

[Read More Answers.](#)

Question # 132

What is the function of bone marrow?

Answer:-

Bone marrow serves as a site for B-cell development and maturation. Immature B-cells proliferate and differentiate within the microenvironment of the bone marrow into immuno competent of bursal lymphocyte (or) B-cell.

[Read More Answers.](#)

Question # 133

What is the relation between thymus and immune function?

Answer:-

The importance of thymus in lymphocyte proliferation and development of cell mediated immune response came from experiments involving neonatal thymectomies in which the thymus was surgically removed from newborn mice. These thymectomized mice showed a dramatic decrease in T-Lymphocytes and an absence of cell mediated immune response. This condition is seen in congenital birth defect in humans.

[Read More Answers.](#)

Question # 134

What is the function of thymus?

Answer:-

The primary function of thymus is the production of thymic lymphocyte. It is the major site for lymphocyte proliferation in the body.

[Read More Answers.](#)

Question # 135

What are secondary lymphoid organs?

Answer:-

Lymph node, spleen, various mucosal associated lymphoid tissues (MALT) are secondary lymphoid organs. After acquiring immune competency, the lymphocytes migrate along blood and lymph streams and accumulate in the peripheral lymphoid organs.

[Read More Answers.](#)

Question # 136



What are primary lymphoid organs?

Answer:-

Thymus and Bone marrow are the primary lymphoid organs. During haematopoiesis, immature lymphocytes are generated. These become mature and acquire immune competence within primary lymphoid organs. Primary lymphoid organs are also called as central lymphoid organs.

[Read More Answers.](#)

Question # 137

What is artificial passive immunity?

Answer:-

It is the resistance passively transferred to a recipient by administration of antibodies.

[Read More Answers.](#)

Question # 138

What is natural passive immunity?

Answer:-

It is the resistance passively transferred from the mother to the baby. Antibodies are transferred predominantly through the placenta. By active immunization of mother during pregnancy is possible to improve the quantity of immunity.

[Read More Answers.](#)

Question # 139

How Passive immunity is classified?

Answer:-

Passive immunity is classified into two types.

1. Natural passive immunity
2. Artificial passive immunity

[Read More Answers.](#)

Question # 140

Define artificial active immunity, and give an example?

Answer:-

It is the resistance induced by vaccines. Vaccine is preparation of live or killed microorganisms or their products used for immunization.

Ex: 1. Bacterial vaccines- 1) Live - BCG for Tuberculosis

Killed - TAB for entire fever.

Ex: 2. Viral vaccines- 1) Live - ORAL polio militias.

Killed - SALK polio militias

[Read More Answers.](#)

Question # 141

Define natural active immunity, and give an example to support the definition?

Answer:-

Natural active immunity results either from a clinical or in appointed infection with a parasite.

Ex: 1. a person who has recovered from an attack of measles develops natural active immunity.

Ex: 2. the immunity is life long in case of viral diseases such as chicken pox or measles.

[Read More Answers.](#)

Question # 142

Into how many types is active immunity further classified? What are they?

Answer:-

Active immunity is classified into two types-

1. Natural active immunity
2. Artificial active immunity

[Read More Answers.](#)

Question # 143

Define passive immunity?

Answer:-

The resistance that is transmitted from a recipient in a ready-made form is known as passive immunity.

[Read More Answers.](#)

Question # 144

Define active immunity?

Answer:-

Active immunity is the resistance developed by an individual because of antigenic stimulus.



[Read More Answers.](#)

Question # 145

Into how many types acquired immunity is classified.

Answer:-

Acquired immunity is classified into two types.

1. Active immunity and
2. Passive immunity

[Read More Answers.](#)

Question # 146

How many major groups of cells are involved in acquired immunity?

Answer:-

It involves two groups of cells. They are

Lymphocytes
Antigen Presenting Cells (APCs)

[Read More Answers.](#)

Question # 147

How many types of defensive barriers are there in innate immunity?

Answer:-

There are four types of defensive barriers.

1. Anatomic
2. Physiologic
3. Endocytic and phagocytic and
4. Inflammatory components

[Read More Answers.](#)

Question # 148

Define acquired immunity.

Answer:-

The resistance that an individual acquired during life is known as acquired immunity. Unlike innate immunity, this immune system is highly adaptive and exhibits four characteristic features.

1. Antigen specificity
2. Diversity
3. Immunologic memory
4. Recognition of self from non-self antigens

[Read More Answers.](#)

Question # 149

Define innate immunity.

Answer:-

Innate immunity is the resistance to diseases that an individual has from the time of its birth.

[Read More Answers.](#)

Question # 150

Into how many types immunity is classified.

Answer:-

Immunity is classified into two types.

1. Innate immunity (or) native immunity (or) natural immunity
2. Acquired immunity

[Read More Answers.](#)

Question # 151

Define immune system

Answer:-

Immune system is a defense system that protects from pathogenic microorganisms (harmful) and cancer.

[Read More Answers.](#)

Question # 152

Define the term immunity

Answer:-

Immunity refers to the resistance exhibited by the host towards injury caused by microorganisms and their products.

(Or)



Immunity is concerned with resistance to infection.

[Read More Answers.](#)

Question # 153

What is isotype switching?

Answer:-

It is conversion of antibody class to another resulting from genetic rearrangement of heavy chain constant region genes in B cells. Isotype switching is also called as class switching.

[Read More Answers.](#)

Question # 154

What is lysogeny?

Answer:-

The condition in which viral genome that is provirus associated with host genome in a way that the viral genes remain in unexpressed state.

[Read More Answers.](#)

Question # 155

What is microglial cell?

Answer:-

Macrophage found in central nervous system is called microglial cell.

[Read More Answers.](#)

Question # 156

What is a myeloma cell?

Answer:-

It is a cancerous plasma cell.

[Read More Answers.](#)

Question # 157

What is myeloma protein?

Answer:-

It is a monoclonal immunoglobulin, which is produced by myeloma cell.

[Read More Answers.](#)

Question # 158

What is multiple sclerosis?

Answer:-

An autoimmune disease affects the central nervous system.

[Read More Answers.](#)

Question # 159

What is a pathogen?

Answer:-

Pathogen is a disease-causing organism.

[Read More Answers.](#)

Question # 160

What is a stem cell?

Answer:-

It is a cell, from which differentiated cells derive.

[Read More Answers.](#)

Question # 161

What is tapasin?

Answer:-

It is a protein that is associated with class I MHC molecules.

[Read More Answers.](#)

Question # 162

What is a vaccine?



Answer:-

It is a preparation of antigenic material used to induce immunity against pathogens.

[Read More Answers.](#)

Question # 163

What are tumor antigens?

Answer:-

Tumor antigens are cell surface proteins, which are present on the surface of tumor cells that induce cell-mediated immune response.

[Read More Answers.](#)

Question # 164

Name the parasite, which causes malaria?

Answer:-

The parasites that cause malaria are Plasmodium vivax, Plasmodium falcifarum.

[Read More Answers.](#)

Question # 165

Name the parasite, which causes leishmaniasis?

Answer:-

It is Leishmania species.

[Read More Answers.](#)

Question # 166

Name the parasite, which causes chagas disease?

Answer:-

It is Trypanosoma cruzi.

[Read More Answers.](#)

Question # 167

Name the parasite, which causes sleeping sickness or trypanosomiasis?

Answer:-

Trypanosoma rhodense, Trypanosoma gambiense

[Read More Answers.](#)

Question # 168

What is the mechanism of host defense in malaria?

Answer:-

Blocks invasion and opsonises for phagocytosis

[Read More Answers.](#)

Question # 169

What is the mechanism of host defense in leishmaniasis?

Answer:-

Restrict the spread of disease.

[Read More Answers.](#)

Question # 170

What is the mechanism of host defense in chagas disease?

Answer:-

Lysis in presence of compliment

[Read More Answers.](#)

Question # 171

What is the mechanism of host defense in trypanosomiasis?

Answer:-

Opsonises for phagocytosis

[Read More Answers.](#)

Question # 172

What is the response type and activity shown by effector molecule IgA?



Answer:-

Blocks binding of virus to host cells, thus preventing infection

[Read More Answers.](#)

Question # 173

What is the response type and activity shown by effectors molecules IgG, IgM and IgA?

Answer:-

Blocks fusion of viral envelope to the cell plasma membrane

[Read More Answers.](#)

Question # 174

What is the response type and activity shown by effector molecule IgG, IgM?

Answer:-

Enhances phagocytosis by opsonization

[Read More Answers.](#)

Question # 175

What is the response type and activity shown by effectors molecule IgM?

Answer:-

Agglutination

[Read More Answers.](#)

Question # 176

What is the response type and activity shown by effectors molecule complement activated by IgG or IgM?

Answer:-

Mediated opsonization

[Read More Answers.](#)

Question # 177

What is the response type and activity shown by effectors molecule IFN ? secreted by TH or TC cell?

Answer:-

Cell mediated immune response.

[Read More Answers.](#)

Question # 178

What is the response type and activity shown by effectors molecule cytotoxic T cells?

Answer:-

Cell mediated immune response.

Activity: Kills virus infected self-cells.

[Read More Answers.](#)

Question # 179

What is the response type and activity shown by effector molecule natural killer cell macrophages?

Answer:-

Cell mediated immune response.

Activity: Kills virus infected cells by ADCC.

[Read More Answers.](#)

Question # 180

What is the host defense mechanism shown if an attachment is made to host cell?

Answer:-

Blockage of attachment by secretory IgA antibodies

[Read More Answers.](#)

Question # 181

What is the host defense mechanism shown if the infection is through proliferation?

Answer:-

Phagocytosis complement mediated lysis localized inflammatory response.

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**Question # 182**

What is the host defense mechanism shown if the infection is through invasion of host tissues?

Answer:-

Antibody mediated agglutination.

[Read More Answers.](#)

Question # 183

What is the host defense mechanism shown if the infection is through toxin-induced damage of host cells?

Answer:-

Neutralization of toxin by antibodies

[Read More Answers.](#)

Question # 184

What is an exon?

Answer:-

Exon is a region of a gene that contains coding sequences for a "polypeptide".

[Read More Answers.](#)

Question # 185

What is an intron?

Answer:-

The nucleotide sequence present between exons of a gene. They can be removed by the process of splicing.

[Read More Answers.](#)

Question # 186

What is immunolabeling?

Answer:-

Labeling molecules by the use of antibodies bound to another molecule that serves as labels for an antigen antibody complex.

[Read More Answers.](#)

Question # 187

What is immunoblotting?

Answer:-

This is a technique to determine the presence of an antigen by the reaction of labeled antibodies to the antigen. This is done after separating the antigens according to the size or charge by gel electrophoresis.

[Read More Answers.](#)

Question # 188

What is i-gene?

Answer:-

It is a bacterial gene, that code for lac operon- repressor protein.

[Read More Answers.](#)

Question # 189

What is an iso antigen?

Answer:-

It is produced only by some members of a species but not the others. These are capable of eliciting immune response in the individuals that lack the antigen.

[Read More Answers.](#)

Question # 190

What is the other name of isoantigen?

Answer:-

The other name is Alloantigen.

[Read More Answers.](#)

Question # 191

Give an example for alloantigen

Answer:-

Blood group antigens are alloantigens.

[Read More Answers.](#)

**Question # 192**

Name some features of a secondary immune response that distinguish it from primary immune response

Answer:-

Secondary immune response requires an amplified population of memory cells. Response is more rapid compared to primary immune response.

[Read More Answers.](#)

Question # 193

Describe major events in the inflammatory response.

Answer:-

The following are the major events in the inflammatory response:

The diameter of the capillaries increases in the affected region and their permeability, which facilitates influx of white blood cells.

[Read More Answers.](#)

Question # 194

What does the following sentence mean? T cell is said to be class I restricted.

Answer:-

It means that they can recognize the antigen, which is, associated with class I MHC molecules.

[Read More Answers.](#)

Question # 195

Name the assay method for IgG in serum.

Answer:-

The method is ELISA.

[Read More Answers.](#)

Question # 196

Name the assay method for complement component C3 on glomerular basement membrane.

Answer:-

Immunofluorescence

[Read More Answers.](#)

Question # 197

Name the assay method for horsemeat combination of hamburger.

Answer:-

Agglutination

[Read More Answers.](#)

Question # 198

Name the assay method for insulin in serum.

Answer:-

ELISA or RIA

[Read More Answers.](#)

Question # 199

How B cell hybridomas are formed?

Answer:-

They are formed by the fusion of antigen primed B cells with cancerous plasma cells.

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Question # 200

Expand cell line HL-60.

Answer:-

Human myeloid leukemia cell line

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