 *IQRA NATIONAL UNIVERSITY*

*DEPARTMENT OF ALLIED HEALTH SCIENCE*

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*PAPER IMMUNOLOGY & SEROLOGY*

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 *SUBMITTED TO Ms SAIMA HADI*

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***Q(1)Define the following terms.***

***Ans***

* + ***IMMUNOLOGY***

*Is the study of immune system and is a very important branch of medical and biological sciences.*

*OR;*

* *Medical & biological field.*

# The study of immune is called immunology

OR

* For the protection of our body from different pathogen & harmful substances body has specilised system consisting a special cell & organ involing in the protection of defeciency our body .
* ***SEROLOGY***
* *Sera means serum*
* *Logy means study*
* *The study of medical science dealing with blood serum & its immunology reaction (Antigen, Antibody) is called serology.*
* *Reaction of antigen & antibody is called serology*

*OR*

* *The medical science dealing with blood serum especially in regard to its immunological reaction (antigen antibody reaction)*

*OR*

*The diagnostic examination of blood serum especially with regard to the response of the immune system to pathogen .*

* ***ANTIBODY***
* *Antibody is a protein that release against antigen to destroy any foreign substancs .*

*OR*

* *An****antibody****(Ab)is a protein produced mainly by plasma cells that is used by the immune system to identify and neutralize pathogens such as bacteria and viruses etc.*
* *Produce mainly by plasma cell (B cell).*

*OR*

* *Antibodies are globulin proteins (immunoglobulins) that react specifically with the antigen that stimulated their production*
* ***ANTIGEN***
* *Any forign particale (toxin,pathogen) that induce immune response is called antigen*

*OR*

* *A toxin or any foreign substance which induces an immune response in the body, especially the production of antibodies*

*Q(2)* ***Differenttiate b/w innate & acquired immunity?***

***Ans***

* ***Innate immunity***
* *Natural immunity by birth*
* *During development non specitic*
* *Alwayes active or present*
* *Rapid response*
* *Memory absent*
* *Less diverse*
* *Present prior to response to microbes*
* *Does not improve after exposure*
* *killingmicrobes(macrophage)neutrophill,dendrifingcell(antigen present in cell ) present infected cell*
* ***Accuired immunity***
* *Accuired immunity after birth*
* *Specitic*
* *Active after*
* *Exposure with Ag*
* *Occur after exposore of microbes*
* *Accquired can be active or passive*
* *Delery response*
* *Memory present*
* *More diverse*

*OR*

* ***Innate Immunity***
	+ *Exists* ***prior to exposure*** *to the microbe (antigen)*
* ***Nonspecific*** *and includes host defenses such as barriers to infectious agents:*
* *Skin and mucous membranes*
* *Certain cells (e.g., natural killer cells)*
* *Certain proteins (e.g., the complement cascade and interferons), and*
* *Involves processes such as phagocytosis and inflammation*
* ***Acquired Immunity***
* *Occurs* ***after exposure*** *to an agent,* ***improves upon repeated exposure,*** *and is* ***specific***
* *Mediated by antibody produced by B lymphocytes and by two types of T lymphocytes, namely, helper T cells and cytotoxic T cells*
* *Acquired immunity have* ***long-term memory*** *for a specific antigen*
* *Acquired immunity can be* ***active or passive***

*Q 3* ***write note on immunoglobulins?***

***Ans***

* *Antibodies are globulin proteine (immunoglobulines (Ig)) that react specifically with the antigen that stimulated their production they mack about 20% of the proteine in the blood plasma . blood contains three types of globulines. Alpha beta and gammabased on their electrophoretic migration rate.*
	+ - *Any of a class of proteins present in serum and cells of the immune system which function as antibodies.*
		- *Variable light chain =vl*
		- *Constant light chain =cl*
		- *Variable havey chain=vh*
		- *Constant havey chain=ch*

*Light chain /Heavy chain=divide into variable and constant region*

*So heavy chain =one variable light/3constantregion (CH1,CH2,&CH3)*

*Light chain =one variable light region /one constant light region*

* ***Structure of Antibodies :***

 Structure of antibodies is “Y” shape.

 In which have two light chains and two heavy chains.

1. FAB region . ( Fragment of antigen and antibody ) that helps in antigen binding .
2. HIG region. ( That holds antibody ) In which have Di-salphoid bond present.
3. FC region . ( Fragment of crystallization ) they activate compliment system.
* ***Immunoglobulin class/types***
* *IgG(Gamma)*
* *IgA(Alpha)*
* *IgM(Mov)*
* *IgE(Epsilon)*
* *IgD(Delta)*
* *IgG*
* *Each IgG molecule consist of two L chain and two H chain linked by disulfide bond (molecular formula H212) becase it has two identical antigen-binding sites it is sade to be divalent .*
* *Produce in secondary response of infection*
* *Molucular weight =150×1000*
* *75%(tolal present in the serum)*
* *Cannot activate complement system*
* *IgM*
* *IgM is the main immunoglobuline produced early in the primary respone .it is present as a monomar on the surface of virtully all B cell where it function as an antigen-binding receptor*
* *It can bind to antigen at time*
* *Molecular wieght 900×100*
* *Most important immunoglobuline in agglution.*
* *IgD*
* *this immunoglobuline has no knowa antibodies function but may function as antigen receptor it is presnt in the surface of many B lymhocytes it is present in small amount of serum.*
* *0.2% present in serum*
* *180×1000m.w*
* *Cannot cross placenta*
* *IgA*
* *IgA is the main immunoglobuline in secretion such as colostrum ,saliva , tears, and respiration intestine and gentical tract secretion*
* *Mole wieght 170×1000*
* *15% total immunoglulin in serum*
* *IgE*
* *IgE is the medically important for two resan*
* *(1 )it mediate immediat (anaphylactic )hypersensitivity*
* *(2)it is the particitein host defanes againstcertain parasites e,g (helminths{worm})*

***Q 4 Describe autoimmune disorders and its types?***

***Ans***

* *Autoimmune is the susten of immune responses ofin organism agaisntits own healthy cells & tissuse any dieases that reasult from such aberrant immune response .*
* *In can cause abnormally low activity or over activaty or of the immune system*
* *In case of immune system is over attack the attacks on its own tissue &n demage*

*OR*

*Immune system of a host –reacts against its healthy cells & tissues*

*Self prens cells & tissues*

* ***Types of autoimmnune distorder***
* ***Rheumatiod arthriti***

*The immune system produces antigen bodies demage the living jionts*

* ***Inflammatry bewel disease***

*The immune system attacks the living of the intertines.*

*Can cause dirrhea, rectal bleeding,bowel movententetc*

* ***Multiple scerosis***

*Attacks on nevers cell*

*Causing symptom that can include pain blindness ,weakness ,muscle sparm etc*

* ***Guilain (barre syndrom )***

*Immune system attacks nevers cantrolling muscle in the legs.*

***Q 5 Explain active & passive immunty?***

***Ans***

* ***Active immunty***

*The immunte which result from the production of antibodis by the immune system in response to the presenceof antigen*

***FOR EXAMPLE***

*An individual who recover from a fist case of the measles is immune to futhure infection*

***OR***

* *Is the resistance induced after contact with foreign antigen (microoganism)*
* *Immunization with live or killed infections agent*
* *Long term resistance*
* *Slow onset*

Active immunity further classify into two forms:

 1: **Natural immunity:**

* During the infection time the natural immunity itself activate or naturally activate against pathogens. Produce antibodies.

 2: **Artificiall immunity:**

* Artificial immunity provide through vaccination.
* ***Passive immunty***
* *Is resistance induced based on antibodies perform in onathor host*
* *Short term resistance*
* *Perform avility of huge of antibodies*

***OR***

*Transfar of factive humorol immunty of ready made antibodies passive immunization can be provided when people cannot systehesize antibodies and when they have been exposed to a diserse that they do not have immunty*

 They are further divide into two classes:

 1: **Natural Immunity :**

Transfer from mother to child this immunity through breast milk.

 Transfer from mother to fetus through placenta.

 2: **Artificiall immunity:**

 Injection is artificial immunity.

 Due to they immediately response show.

 Example: Snack bite or Dog bite, Rabies , Tetanes during this time take premade antibodies.

# Q 6 what are the different factors that affects immunogenicity ?

***Ans***

*there are different factors which effecting immunogenicty but some of them are the following.*

1. *Antigen*

***1:Foregness***  *(*When foreign substance comes to the body. The consider as a foreign partiacl or “ Non self ” then induce the immune response.) 2:***Molecular size*** *(* Molecules with different size and having different immunogenicity .depend on the Size of molecule)

3: **Chemical Structure :**

An antigen chemical structure is more complex produce more immunogenic

 response.Chemical structure is not complex will quickly killed.

 4: **Dosage route timing :**

They are also important factors.

 5: **Adjuvants :**

 Adjuvant some protein they give along with vaccine. They inhance the immune response.

* *Chemical composition and heterogenecity*
* *Epitopes*
* *Chemical nature*
* *Contiibution of the immunogebuline*