NAME: BOBOLA PRAISE MEDICAL SURGICAL ASSIGNMENT.

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**ROLE OF THE IMMUNE SYSTEM**

The role of immune system is to protect our body from any foreign matters that might cause any damage to homeostasis imbalance. The success of the immune system depend s on its ability to discriminate between foreign (non-self) and host (self) cells. When an organism is threatened by microorganism viruses, or cancer cells, the immune system acts to provide protection. Normally, the immune system does not mount a response against self. This lack of an immune response is called tolerance.

When a foreign matter enters the human body our defense system recognizes this as foreign through the immune system. How the human body recognizes this as foreign against itself employs a complex I.D. system. Each cell in the human body carries on its surface a mixture of [proteins and sugar that serve to identify the cell to the immune system. Foreign objects lack the identifiers that all of the body’s cells have, but each one has unique features of antigens where the immune system attaches identifiers called antibodies. This is the basis for specific defense mechanisms. Once you have built antibodies for a specific antigen, the immune system will respond faster than if there had been to previous exposure to the antigen (i.e. you are immune to the pathogen, but only that specific pathogen because your immune responds faster). The non-specific parts of the immune system is composed of phagocytes which engulfs and digests foreign substances like bacteria and virus do not bear the specific identifiers.

**TYPES OF IMMUNITY**

a). Innate immunity

b). Adaptive immunity.

a). Innate immunity :It is also called native immunity. Is the first line of defense against pathogens, it exist by virtue of an organisms constitution, that is its genetic makeup, without an external stimulation or a previous infection. It is divided into two types (i). Non-specific innate immunity: a degree of resistance to all infections in general (ii) Specific innate immunity: a resistance to a particular kind of microorganisms only. As a result, some races, particular individuals or breeds in agriculture do not suffer from certain infectious disease

b). Adaptive immunity: it can be sub-divided depending on how the immunity was introduced. They are: (i) Natural immunity: they are acquired through chance contact with a disease causing agent. (ii). Acquired immunity develops through deliberate actions such as vaccinations.

Both natural and artificial acquired immunity can be further sub-divided into passive and active.

* Passive immunity: is the transfer of active immunity, in the form of ready- made antibodies from one individual to another. Passive immunity provides immediate protection, but the body does not develop memory therefore the patients is at risk of being infected by the same pathogen later. E.g. it can be acquired naturally when maternal antibodies are transferred to the fetus through the placenta.

(i). Artificial acquired passive immunity is a short-term immunization induced by the transfer of antibodies, which can be administered in several forms as human/ animal blood plasma as pooled human immunoglobulin.

\* Active immunity: when B-cells and T-cells are activated by a pathogen, memory B-cells and T-cells develops and the primary immune response results.

Throughout the lifetime of human, these memory cells will remember each specific pathogen encountered and can mount a strong secondary response if the pathogen is detected again.

(i). Natural acquired active immunity; it occurs when a person is exposed to a live pathogen and develops a primary immune response which leads to immunological memory.

(ii). Artificial acquired active immunity: it can be induced by a vaccine, a substance that contain antigen. A vaccine stimulates a primary response against the antigen without causing symptoms of the disease.

TYPES OF ANTIBODIES AND THEIR FUNCTIONS.

Antibodies come in varieties known as isotypes or classes in placenta there are five antibody isotypes known as IgA, IgD, IgE, IgG, and IgM. The different suffixes of the antibody isotypes denotes the different types of heavy chains the antibody contains, with each heavy chains the antibody contains, with each heavy chain class named alphabetically: α (alpha), γ(gamma), δ(delta), ε (epsilon), and μ (mu). This gives rise to IgA, IgG, IgD, IgE, and IgM, respectively.

* IgG: is the most abundant antibody isotype in the blood plasma, accounting for 70-75% of human immunoglobulin’s (antibodies). IgG detoxifies harmful substances and is important in the recognition of antigen-antibody complexes by leukocytes and macrophages IgG is transferred to the fetus through the placenta and protects the infants until its own immune system is functional
* IgM: is usually circulates in the blood accounting for about 10% of human immunoglobulins. IgM has a pentameric structure in which five basic Y-shaped molecules are linked together. B-cells produce IgM first in response to microbial/ antigen invasion. Although IgM has a lower affinity for antigens than IgG, it has higher avidity for antigens because of its pentameric/hexameric structure. IgM, by binding to the cell surface receptor, also activates cell signaling pathways. It eliminates pathogens in the early stages of B-cell mediated (humoral) immunity before there is sufficient IgG.
* IgA: IgA is abundant in serum, nasal mucus, saliva, breast milk, and intestinal, fluid, accounting for 10-15% of human immunglobulins. IgA forms dimers (i.e. two IgA monomers joined together). IgA in breast milk protects the gastrointestinal tract of neonates from pathogens.
* IgE: IgE is present in minute amounts, accounting for no more than 0.001% of human immunoglobulins. Its original role is to protect against parasites. In regions where parasitic infections are rare, IgE is primarily involved in allergy.
* IgD: IgD accounts for less than 1% of human immunoglobulins. IgD may be involved in the induction of antibody production in B-cells, but its exact function remains unknown.