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ASSIGNMENT

1. EXPLAIN THE ROLE OF THE IMMUNE SYSTEM.
2. DESCRIBE THE TWO TYPES OF IMMUNITY.
3. EXPLAIN THE DIFFERENT TYPES OF ANTIBODIES AND THEIR ROLES.

ANSWER

THE ROLE OF THE IMMUNE SYSTEM

The basic function of the immune system is to remove foreign antigens such as viruses and bacteria to maintain homeostasis. The success of the immune system depends on its ability to discriminate between foreign (non self and host self) cells. When an organism is threatened by micro-organisms, viruses, or cancer cells, the

immune system acts to provide protection.

TYPES OF IMMUNITY

They are two general of immunity which are; Natural (innate) and acquired (adaptive)

1. Natural immunity (innate):

Natural immunity which is non-specific provides a broad spectrum of defense against and resistance to infection. It is considered the first line of host defense following antigen exposure, because it protects the host without remembering prior contact with an infectious agent. Natural (innate) immunity coordinates the initial response to pathogens through the production of cytokines and other effector molecules, which either activate cells for control or promote the development of the acquired immune response. Natural immune mechanism can be divided into two stages: Immediate (generally occurring

within minutes) and delayed (occurring within several days after exposure).

2. Acquired immunity (adaptive):

Acquired (adaptive) immunity usually develops as a result of prior exposure to an antigen through immunization (vaccination) or by contracting a disease, both of which generate a protective immune response weeks or months after exposure of disease or vaccine, the body produces an immune response that is sufficient to defend against the disease on re-exposure. In contrast to the rapid but nonspecific natural immune response, this form of immunity relies on the recognition of specific foreign antigens. The acquired immune response is broadly divided into two mechanisms which are:

1. The cell mediated response, involving T-cell activation and
2. Effector mechanism, involving

B-cell maturation and production of antibodies.

The two types of acquired immunity are known as active and passive and interrelated.

Active acquired immunity refers to immunologic defenses developed by the person's own body. This immunity typically lasts many years or even a lifetime. Passive acquired immunity is temporary immunity transmitted from a source outside the body that has developed immunity through previous disease or immunization.

3. THE DIFFERENT TYPES OF ANTIBODIES AND THEIR ROLES

1. IgG: IgG detoxifies harmful substances and is important in the recognition of antigen-antibody complexes by leukocytes and macrophages.
2. IgM: IgM usually circulates in the blood according 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 infection/antigen invasions.

3. IgA: IgA is abundant in serum, nasal mucus, saliva, breast milk, and intestinal fluid, accounting for 10-15% of human immunoglobulins. IgA forms dimers (i.e. two IgA monomers joined together). IgA in breast milk protects the gastrointestinal tract of neonates from pathogens.

4. IgE: IgE's original role is to protect against parasites. In regions where parasitic infection is rare, IgE is primarily involved in allergy.

5. IgD: IgD accounts for less than 1% of human immunoglobulins. IgD may be involved in induction of antibody production in B-cells, but its exact function remains unknown.