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ASSIGNMENT

1. The role of the immune system is to protect our body from any foreign matters that might cause any damage or homeostasis imbalance. 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 microorganisms, 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.
2. The two types of immunity are the:

* Innate immunity
* Adaptive immunity

THE INNATE IMMUNITY

The innate system in mammalians, for example, is composed of primitive bone marrow cells that are programmed to recognise foreign substances and to react. Innate immunity, also called native immunity, exists by virtue of an organisms constitution, that is its genetic make-up, without an external stimulation or a previous infection. It is divided into two types:

(a) Non-Specific innate immunity, a degree of resistance to all infections in general.

(b) Specific innate immunity, a resistance to a particular kind of microorganism only. As a result, some races, particular individuals or breeds in agriculture do not suffer from certain infectious diseases.

THE ADAPIVE IMMUNITY

The adaptive system is composed of more advanced lymphatic cells that are programmed to recognise self-substances and not to react. Adaptive Immunity has divided into two depending on how it was introduced into the body:

1. Naturally acquired immunity develops through chance contact with a disease-causing agent.
2. Artificially acquired immunity' develops through deliberate action such as vaccination.

Both naturally and artificially acquired immunity can be further subdivided depending on whether the host built up immunity itself by antigen as 'active immunity' and lasts long-term, sometimes lifelong. 'Passive immunity' is acquired through transfer (injection or infusion) of antibodies or activated T-cells from an immune host; it is short lived—usually lasting only.

1. THE DIFFERENT TYPES OF ANTIBODIES AND THEIR ROLES

•IgG

IgG is the most abundant antibody isotype in the blood (plasma), accounting for 70-75% of human immunoglobulins (antibodies). IgG detoxifies harmful substances and is important in the recognition of antigen-antibody complexes by leukocytes and macrophages. IgG is transferred to the foetus through the placenta and protects the infant until its own immune system is functional.

•IgM

IgM 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 infection/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.

•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.

•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 infection is 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.