Immune response against hiv

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Immune Response Against HIV The immune system is a defense mechanism of a body. It works against the invasion and threats of viruses, bacteria and other microscopic organisms recognized as non-self. A good example of a virus that the immune system fights against is HIV (human immunodeficiency virus), which is responsible for causation of AIDS.

The body immune system is comprised of a complex system of white blood cells as well as blood proteins that work together in response to, and reduce the damage caused by disease causing organisms. The white blood cells constitute of phagocytes which are part of the non-specific defense mechanism, and two types of lymphocytes (T-cells and B-cells) which are part of the specific defense mechanism. The immune system fights and eliminates non-self materials in different stages.

During the 1st stage, the phagocytes try to engulf and destroy the non-organic enemies that they detect in the body. Unfortunately, phagocytes lack the ability to destroy organic invaders such viruses. Therefore, the phagocytes call for help from other macrophages by sending signals when organic invaders such as HIV invade the body. The macrophages then engulf the virus and displays pieces of it on their surfaces (antigen presentation). The portions of the virus that are displayed on the surface of the macrophage inform the T-cells of the foreign invaders that need immediate attention. The naïve T-cells then chip in to save the body from the foreigner; the CD4 T Helper cells recognize the foreign antigen and send signals to mobilize other troops to fight the disease causing microorganisms (Milley, 2003).

Stage II of the fight against viruses takes place after the CD4 have received information concerning foreign invaders in the body. During this stage, the

CD4 divides and send signals that activate other components required in the defense system. The additional forces include B-Cells and CD8 T-cells (killer cells). It is also during this stage that B-cells divide to form antibodies that surround and immobilize bacteria and virus that are moving in the blood before invading a cell. The antibodies achieve this by neutralizing as well as attaching to the surfaces of the viruses.

HIV virus is known of invading a human cell and making it a factory for viruses. Responding to the instructions given by T-helper cells, “ CD-8 T-cells destroy the infected cells by chemically piercing their membranes so that the contents spill out” (Milley, 2003 p. 9). The spilling out of the cell contents controls the replication cycle of the HIV virus. However, it is evident that some HIV viruses do manage to escape the activities of the killer T-cells. These are the viruses that interrupt the action of the immune system by infecting the helper T-cells. “ Once the infected helper T-cells are activated, they work to create new viruses instead of doing the job they are supposed to do in a human’s immune system” (“ Immune System 101” 2011). Additionally, many helper T-cells are also destroyed in the division (replication) of the HIV viruses. The destruction of CD4 T-cells results to destruction of many cells by the replicating HIV viruses.

In conclusion, the immune system is the defense mechanism for a human body. It protects the body from foreigners such as viruses and bacteria. Its destruction of the HIV virus in the body involves different stages. Phagocytes are involved in destruction of non-organic materials in the body. The macrophages then aid in presenting the information on the virus on their surfaces. The CD-4 then uses the information presented on the surface of the macrophages to activate many soldiers such as killer T-cells. Killer T-cells do

manage to kills HIV viruses, but some do escape, multiply and destroy T-helper cells.

References

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