Immunity:

- -There are two types of lymphocytes: T-Cells and B-Cells.
- -B-Cells produce antibodies (Ab) when exposed to a foreign (non-self) protein or antigen (Ag). This is called 'Humoral Immunity'.
- -B-Cells produce antibodies, both secreting them directly into the blood and also having the Ab's sticking out of their surface membrane, and in this way directly bind onto the antigen.
- -A B-Cell that has been exposed to any foreign antigen is now stimulated to produce and secrete antibodies (Ab's). This 'activated' B-Cell is called a 'Plasma Cell'.
- -Based on their size and shape, there are 5 classes of antibody molecules: IgD, IgM, IgG, IgA and IgE, where the Ig=immunoglobulin.
- -There are three types of T-Cells: T_Helper, T-Cytotoxic and T-Suppressor cells. They are called 'Cell-Mediated Immunity'.
- -Each and every one of your human cells has one specific type of protein exposed on their surfaces, this protein is called 'MHC Class I' protein.
- -Only your B-Cells and your Macrophages have another specific cell surface protein called 'MHC Class II' protein.
- -When a foreign protein (antigen) enters your body, it is recognized as foreign by both your B-Cells and your Macrophages.
- -Macrophages phagocytose it, break it apart inside themselves, and stick fragments of it out onto their cell surface, 'displaying' pieces of the foreign antigen.
- -Since the B-Cells normally have their antibodies sticking out of their surface membrane, the foreign antigen will stick to the Ab, and so the antigen will be stuck to the surface of the B-Cell. In this way, like the Macrophages, the B-Cells 'display' the foreign antigen on their surface.
- -Because of this, the Macrophages and the B-Cells are called 'Antigen Presenting Cells' or 'APC'. (Remember that the APC's also have on their surface the MHC Class II proteins.)
- -When a T-Helper cell 'sees' both the displayed antigen along with the MHC Class II protein, it will now become activated to signal more B-Cells and T-Cells and Macrophages to come join the attack. The T-Helper cell as you see does no directly destroy the antigen, it only helps in the attack. The odd and confusing feature we see is that for the T-Helper cell to respond, it has to identify both a cell with MHC Class II protein on its surface (an APC) along with the displayed antigen. Seeing just the antigen alone will not stimulate the T-Helper cell to act.
- -When a virus infects any cell in our body, some of the viral coat will remain stuck to the outside of the infected cell. This viral coat is an antigen. Remember that every cell in your body has on its surface a protein called MHC Class I.
- -T-Cytotoxic cells will only destroy cells that 'display' (have on their surface) both antigen (virus) and the MHC Class I protein.
- -T-Suppressor cells act to turn off all of these destructive immune reactions.
- -An autoimmune reaction or disease occurs as a result of your immune cells recognizing some of your 'self' cell surface proteins as foreign and attacking your normal cells.