**Lecture 8 - Introduction to Immunology**

Normal functions of the immune system:

****A mis-function of the immune system:

**Some definitions:**

**Antigen** = something that is recognized by the immune system.

**Antibody** (Ab, Ig) = Y-shaped protein that recognizes antigens, found on the surface of B-cells or secreted by plasma cells.

**B-cell** = involved in antibody production, has antibody molecule on its surface. Develops into plasma cells after activation by TH cells.

**Plasma cell** = derived from B-cell after activation of the B-cell, produces secreted antibodies.

**TC cell** = part of the cellular immune system

**TH cell** = Activate both B and TC cells.

**MHC** = major histocompatibility complex – protein found on the surface of all cells. MHC presents antigens to T cells, leading to activation of B and Tc cells.

* B-cell: antigens originate from binding to Ab on surface of cell.
* ****All other cells: antigens are from cellular protein synthesis – viral proteins made in infected cells or abnormal proteins in cancer cell.

**TCR** = T-cell receptor – found on the surface of T-cells, recognizes MHC proteins.

**Two branches of the immune system:**

**A. Cellular:**

a) Cell presents virus/cancer antigens on their MHC to T cells.

b) **TH cell** activates TC cells, allowing the Tc to kill virally infected cells.

**B. Humoral (body fluids) = antibodies**

a) B-cell binds antigen (e.g. bacteria) on the antibody on its surface.

b) Antigen is brought into the cell (internalized)

c) Antigen is broken down

d) A small protein fragment of the antigen is displayed (presented) on the MHC on the B-cell

e) B-cell is recognized by **TH-cell** due to MHC-TCR interaction.

f) B-cell develops into plasma cell

g) Plasma cell secretes antibody that binds to antigen, leading to its destruction.