

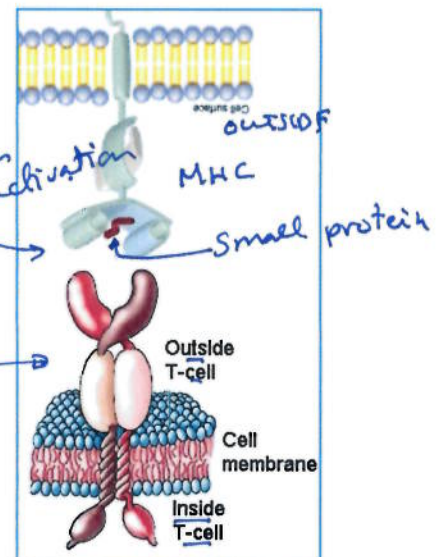
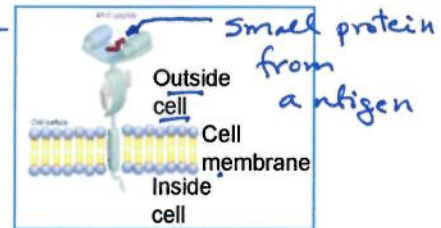
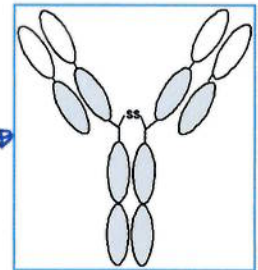
# Lecture 8 - Introduction to Immunology

Normal functions of the immune system: *kill pathogen, kill cancer cells*

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

## Some definitions:

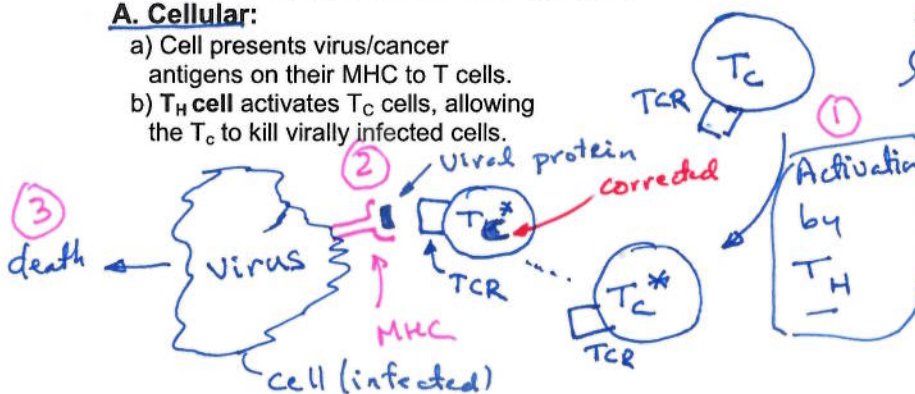
- \* **Antigen** = something that is recognized by the immune system.
- \* **Antibody (Ab, Ig)** = Y-shaped protein that recognizes antigens, found on the surface of B-cells or secreted by plasma cells.
- B-cell** = involved in antibody production, has antibody molecule on its surface. Develops into plasma cells after activation by  $T_H$  cells.
- Plasma cell** = derived from B-cell after activation of the B-cell, produces secreted antibodies.
- $T_C$  cell** = part of the cellular immune system
- \*  **$T_H$  cell** = Activate both B and  $T_C$  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  $T_C$  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:

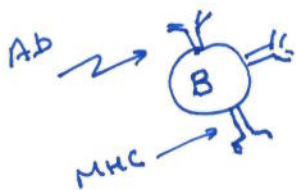
### A. Cellular:

- a) Cell presents virus/cancer antigens on their MHC to T cells.
- b)  $T_H$  cell activates  $T_C$  cells, allowing the  $T_C$  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  $T_H$ -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.



*See lecture 10 (so this will NOT be on the exam)*

