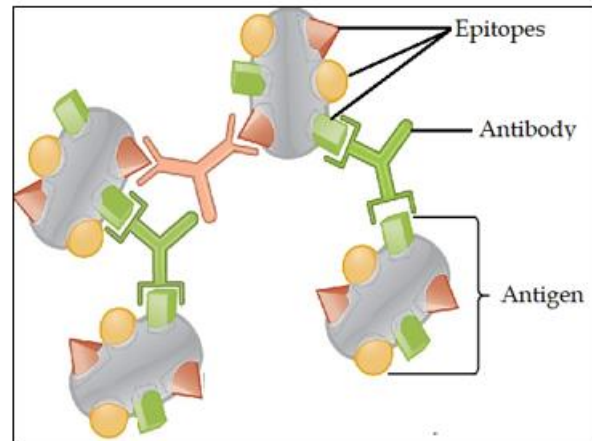


- **Immune Complex:**

Agglutination is the binding of many antibodies on many antigens leading to formation of the immune complex

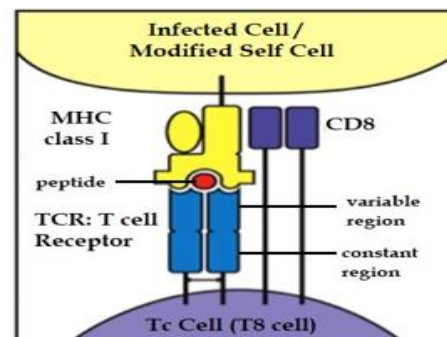


Double Recognition by TCR:

- Unlike antibody, a TCR can't recognize a soluble or free antigens, it can only recognize the antigen or the peptide present within HLA in a way that the **TCR binds the HLA and peptide within it**. This is known as **double recognition**

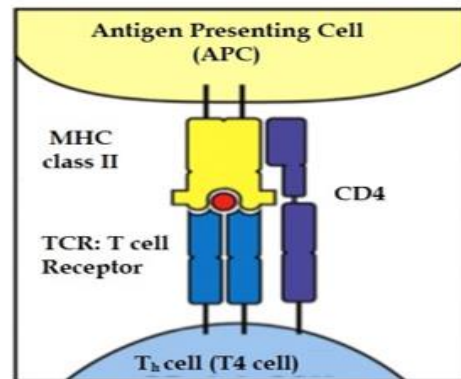
Double recognition by T8 cell

- CD8 of Tc cell binds selectively to class I HLA, and this is why T8 (Tc) cells recognize class I HLA displaying the peptide.



Double recognition of T4 cells

- CD4 binds selectively to Class II HLA and this is why T4 (T_h) recognize class II HLA displaying the peptide



Peptide Presentation to T lymphocyte: Refer to doc. d p: 128

- How does a cell know where to express the non self peptide, on MHC I or MHC II?
- There are 2 cases depending on the pathway of peptide presentation:

- **Endogenous** Produced by the body
- **Exogenous** Produced from external origin

1) **Peptide presentation from Endogenous Pathway:** Peptide presented on HLA is synthesized within cell:

- **In case of self-cell:** Any nucleated self-cell has on its surface HLA I markers and self-peptide within it, but there are **no mature T_C cells that can recognize and attack these cells.** (Because during maturation process all T cell reactive against self-peptides are eliminated).
- **In the case virus infected cell, or modified self:** In this case, self-cells start secretion of viral peptides or non-self-peptide instead of self-peptide, which are then associated within **HLA I** on the surface. **Such cells are recognized through double recognition of T_C cells to destroy them.**

2) **Peptide presentation from Exogenous pathway:** The peptide is synthesized outside the cell:

- **In case of phagocytosis:** When macrophage digests a bacterium or antigen, the remaining peptide of the digested bacterium or antigen is carried to the **surface of macrophage HLA II** to be recognized by T_H cells through **double recognition**. **Note:** macrophage that expresses the non-self-peptide on its HLA II is called **Antigen Presenting Cell (APC)**.

