T-lymphocytes

- T cell receptor
- T – cytotoxic (CD8) cells
- T – helper (CD4) cells
- Activation of T cells

T cell receptor

- Alpha and beta polypeptide chains
- Antigen - major histocompatibility (MHC) binding site

Figure 16.15 – two different T cell receptors
**Figure 16.16**
MHC molecules

- **(a)** MHC Class I Molecule
- **(b)** MHC Class II Molecule

**Figure 16.17**
Antigen recognition by T cells

- Helper T cell recognizes antigen presented by MHC class II molecule
- Cytotoxic T cell recognizes antigen presented by MHC class I molecule

**T – cytotoxic cells**

- Induce apoptosis
- Produce cytokines
- Recognize MHC class I molecules and endogenous antigen
T – helper cells

- Recognize MHC class II and exogenous antigen
- Ex. Th1 cells recognize antigens bound to MHC II molecules on macrophages
- Ex. Th2 cells recognize antigens bound to MHC II molecules on B cells
Activation of T cells

- Dendritic cells
- Activated macrophages
Natural Killer (NK) cells

• Antibody – dependent cellular cytotoxicity (ADCC)
• Kill cells that do not have the MHC class molecules

Figure 16.6
Protective outcomes of Ab-Ag binding

Lymphocyte development

• Generation of diversity
• Negative selection of self – reactive B and T cells
Figure 16.22
Antibody diversity

Negative selection

- Eliminate B cells that recognize “self” molecules (i.e., “clonal deletion”; failure creates autoantibodies)
- B cells do not respond (no specific T cell interaction)
- Eliminate T cells that do not recognize MHC (“positive selection”)
- Eliminate T cells that bind to self peptides presented by MHC molecules (“negative selection”)