

Mechanisms
and
Manifestations of Disease
Lecture 2

Part 3
Cellular and Humoral Immunity

Definitions

■ Cellular Immunity

- ◆ An immune state due to the action of sensitized or activated lymphocytes or macrophages

Cluster Designation (CD)

Term used to identify identical lymphoid cell markers which are detected by different monoclonal antibodies

T cells (T lymphocytes)

- T cell precursors are produced in bone marrow and circulate to thymus for maturation
 - ◆ Thymus present until adolescence then involutes
- **Master regulators of the immune system**
- **Thymus-derived lymphocytes**
 - ◆ Function to **turn on or off** the cells of the immune system

T Cell Populations

- $T_4 = T_H$ and T_{DH} 4 looks like H!
- $T_8 = T_C$ and T_S 8 looks like S!

T cell subpopulations

- T helper cells (T_H) (CD4)
 - ◆ Help in antibody formation
- T cytotoxic (killer) cells (T_C or T CTL) (CD8)
 - ◆ Kill or lyse target cells to which they are sensitized

T cell subpopulations (cont.)

- T delayed hypersensitivity cells (T_{DH}) (CD4)
 - ◆ Mediate the hypersensitivity response
- T suppressor cells (T_s) (CD8)
 - ◆ Limit or control immune responses

Humoral Immunity

- Immunity due to immunoglobulin (antibody) in blood or tissue

B cells (B lymphocytes)

- Bone marrow derived in humans- differentiation may be in fetal liver, GI lymphoid tissue, or peripheral lymph nodes
- Precursors for *plasma cells* (tissue) which synthesize immunoglobulins

IgM

- 10% of AB
- Initial immune response
- Early in infection
- Protects against bacteria and viruses
- Decreases 1-2 weeks as IgG increases
- Mediates ABO blood compatibility

IgG

- 80% of AB
- Secondary response
- Diffuses across placenta and protects neonate
- Neutralizes bacterial toxins
- Diffuses into intravascular spaces

IgE

- Reaginic Antibody
- Immediate hypersensitivity response
- allergic response
- AG triggers IgE; binds to mast cells and basophils causing H⁺ release
- Parasitic infections

IgA

- Secretory
- Found in body secretions, especially GI and respiratory tract
- Common deficiency especially in children

IgD

- Role unknown


