

SPECIFIC DEFENSES: IMMUNITY

revised 15 March 2016
Fr: TFC, 2nd Ed, 437.
Martini 6th:798-817, 7th: 779-825, 8th: 796-822, 10th: 802-828

FUNCTION: **specific antibody** or **T cell** directed against **specific antigen**
enhanced with multiple exposure

IMMUNE SYSTEM has two components:
(p 803 for forms, 805 for overview)

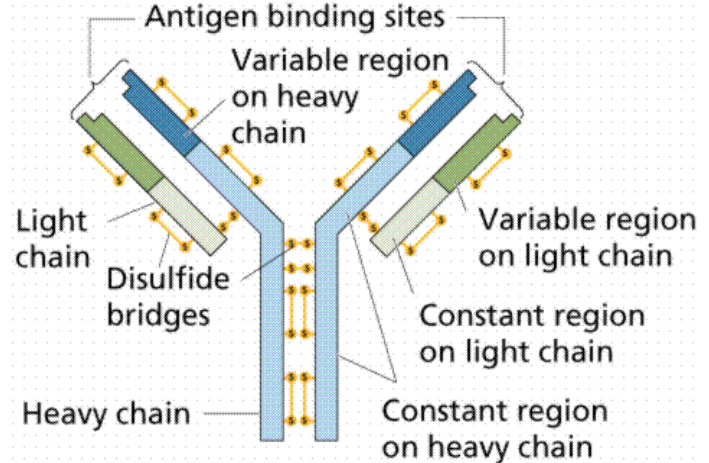
Humoral	(bodily fluid) soluble antibodies made by B cells
Cell-mediated	T cells recognize specific antigen, etc

HUMORAL IMMUNE SYSTEM:
Serum carries **antibodies** in gamma globulin fraction
electrophoresis separates into
pos +: gamma, beta, alpha, album. negative -

ANTIGENS: carry determinant sites = haptens (grasp)

GENERAL ANTIBODY STRUCTURE: p 812

draw molecule: label Ag binding site
light chain
heavy chain
constant region
variable regions
complement activating region

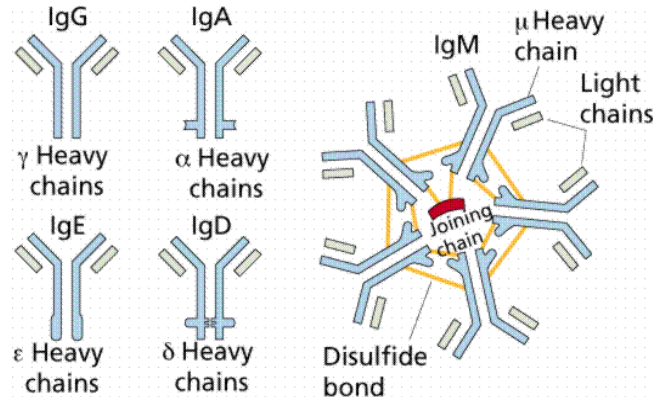


MECHANISM OF IMMUNE RESPONSE:

- | | |
|---------------|--|
| Fetal | 1) generation of library of immune cells by random recombination
2) weed out (kill) cells which make Ab against self |
| Mature | 1) Ag binds, stim immune cell to multiply producing memory and plasma cells (Clonal selection)
2) anamnestic (upward memory) response due to memory cells |

ANTIBODIES:

- | | |
|-------------|---|
| IgG: 80-85% | can cross placenta, as illustrated p 813 |
| IgM: 5-10% | pentamer, first to appear, highly effective agglutinators , microorganisms, ABO blood group antibodies |
| IgA: 15% | carries secretory component, allows secretion into saliva, tears, mucus, breast milk |
| IgD: 0.2% | cannot cross placenta, detectors on surface of B cells, do not fix complement |
| IgE: 0.002% | bound to mast cells , triggers release of histamine , etc, |



CELL-MEDIATED IMMUNITY:

Established by thymus in young animal, produces "T cells" (T for thymus)
Immunity which is not transferred with blood
Effective against tumors, cells with foreign Ag on surface
major histocompatibility complex (MHC, p 807) are cell surface antigens NOT attacked by T cells.
MHC explains tissue rejection, even attractiveness during mate selection

T Cells:

- | | |
|----------------------|---|
| Tc: | cytotoxic (killer cells) |
| Td: | delayed hypersensitivity, release lymphokines : macrophage chemotactic factor, lymphotoxin |
| Th: helper cells | detects foreign surface antigens, identifies, releases lymphokines which attract other immune cells |
| Ts: suppressor cells | |

ACQUIRED ACTIVE IMMUNITY:

natural	through exposure to environmental antigens
artificial	vaccines which purposefully expose the body to antigens

ACQUIRED PASSIVE IMMUNITY

through colostrum
immunoglobulin injections

