SPECIFIC DEFENSES: IMMUNITY

3 Aug 87, 19 April 04, 11 Apr 05, 14Apr08, 8Apr09, 18Apr11
Fr: TFC, 2nd Ed, 437.
Martini 6th:798-817, 7th: 779-825, 8th: 796-822

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

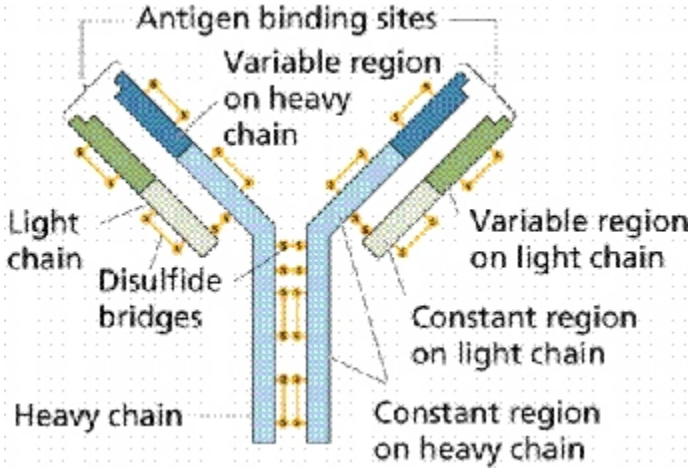
IMMUNE SYSTEM has two components: **Humoral** (bodily fluid) soluble antibodies made by B cells
(p 797 for forms, 799 for overview) **Cell-mediated** T cells recognize specific antigen, etc

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) (p 791)

GENERAL ANTIBODY STRUCTURE: p 806
draw molecule: label Ag binding site
light chain
heavy chain
constant region
variable regions
compliment activating region



MECHANISM OF IMMUNE RESPONSE:
Fetal 1) generation of library of immune cells by random recombination
2) weed out 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

ANTIBODIES:

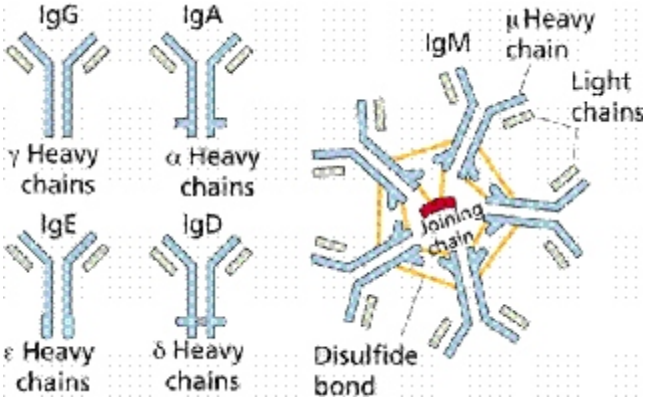
IgG: 80-85% can cross placenta, as illustrated p 807

IgM: 5-10% pentamer, first to appear, highly effective **agglultinators**, 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) 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