DEFENSE: IMMUNITY

8/3/87, RVSD 8/17/94, 14 Aug 00, 7 March 02, 12 Aug 02, 13 Aug 03, 16 Aug04, 17 Aug 05, 8 May 06, 15 Aug07, 18Aug08, 16Aug09
Fr: TFC, 2nd Ed, 437., Alcamo, pp547-581, TFC's 7th: 454-472, 476-495, 8th: 458-481, Black's 6th: 470-577, Bauman 2nd: 462-483

IMMUNE SYSTEM Adaptive Immunity either natural or by immunization
Passive Immunity natural through placenta and milk, or by gamma globulin injections

ANTIGENS: Anything that can cause antibodies to be made. Determinant sites = epitopes = haptens (grasp) (p 463)

LYMPHATIC SYSTEM (p 464) System to bathe organs with lymph, filter lymph, house immune cells
(P 466) lymph node structure

TWO COMPONENTS OF IMMUNE SYSTEM: Humoral [bodily fluid] and Cell-mediated

HUMORAL SYSTEM B cells (first seen in bursa of Fabricius) found in all lymphoid tissues, 10% of circulating lymphocytes. B cells secrete soluble antibodies, found in bodily fluids (humors)
Serum [whey] carries antibodies in gamma globulin fraction
electrophoresis separates serum into protein fractions:
POSITIVE (+): **gamma**, beta, alpha, album. most NEGATIVE (-)

ANTIBODY STRUCTURE (p 467) Illustrate IgG: neutralization, opsinozation, agglutination,(468) [& precipitation]

ANTIBODIES: table: p 469

IgG:	80-85%	monomer	can cross placenta Ag binding, light, heavy chains, constant, variable regions, compliment activating region
IgM	5-10%	pentamer	first to appear, highly effective agglultinators, microorganisms ABO blood group antibodies
IgA	15 %	dimer	carries secretory component, allows secretion into saliva, tears, mucus, breast milk
IgD	0.2%	monomer	cannot cross placenta, surface of B, cells, do not fix complement
IgE	0.002%	monomer	bound to mast cells, triggers release of histamine, anaphylactic rxns, etc

CELL-MEDIATED IMMUNITY: cells (thymus derived), 75% of circulating lymphocytes
Immunity which is not transferred with blood
Effective against tumors, cells with foreign Ag on surface

T Cells: Tc: cytotoxic (killer cells) 471
Td: delayed hypersensitivity, release lymphokines: macrophage chemotactic factor, lymphotoxin
Th: helper cells
Ts: suppressor cells

Recognition of self: (p 473) **Apoptosis** (detach, fall**):** Clonal selection hypothesis: Burnet in 1950s:
Immune cells generated by random genetic recombination: portions of DNA deleted, spliced together
Each cell makes only a single antibody, unique to that cell, coats itself with it
Fetal encounter with an antigen which reacts with the cell coating leads to destruction of cell, creating sense of self (**tolerance)**
Titer = highest dilution which still shows agglutination (etc)

MAJOR HISTOCOMOPATIBILITY COMPLEX: (p 474) glycoproteins identify self.

MECHANISM OF IMMUNE RESPONSE:
Clonal selection, memory and plasma cells 477, 493
anamnestic (upward memory response) increases strength of immune response with each exposure

ACQUIRED IMMUNITY: natural through exposure, artificial, vaccines

HYPERSENSITIVITY: Four types, I, II, III, IV. 508

I Anaphylaxis: within minutes, either systemic or localized, IgE Ab are cytotrophic

IV delayed hypersensitivity 12-24 hours later, tuberculin, PI, hapten binds to cells, T cells and macrophages move in, trigger inflammation.