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Sequence Intro

Monday, February 11, 2008
9:00 AM

- Origins of a disease state: inherited, chemical toxicity, trauma, dietary, infectious pathogen, immune response to self
- The Immune Response
 - Pathogen enters body and travels to nearest lymph node/spleen
 - Innate immunity (non-specific) cells take up pathogen
 - Macrophages specialized to phagocytose
 - Neutrophils for phagocytosis and activation of bactericidal mechanisms
 - Dendritic cells acquire and present pathogens to the immune system
 - Lymphocytes w/ specific antigen receptors recognize antigen
 - Recognition phase of immune response - T and B cells recognize the pathogen by binding to receptors on cell surface
 - Binding of antigen to specific receptor on cell surface
 - Antigens - foreign molecules w/ a distinctive shape
 - Carrier, immunogen - large molecules (>8aa) that are able to elicit a response
 - Hapten, determinant, epitope - small molecules that cannot elicit an immune response but can bind to an antibody
 - B cells - produce antibodies to bind antigens; fcn'l term; one antibody/epitope
 - Immunoglobulin - structural term for antibody
 - Small, round, WBCs; 8-10 microns
 - Activation phase: T and B cells differentiate and divide
 - Adaptive immunity: protection against pathogens that involves specific immunity
 - T cells - development in thymus, CD3 on surface
 - CD4 - helper T - interact with B cells to help them make large amounts of antibody
 - CD8 - cytotoxic T - recognize antigens on the surface of cells infected w/ viruses or intracellular bacteria and kill those cells
 - Do everything via cell to cell contact - cell mediated immunity
 - Effector phase - pathogen is neutralized or otherwise eliminated
 - Helper T cells produce cytokines to act on other cells
 - Lymphokines secreted by one WBC to act on another
 - Interleukins act on other WBCs
 - B cells --> plasma cells --> secrete antibodies; humoral immunity
 - Active Immunization: organism's own immune cells and antibodies mediate response
 - Passive immunization: administration of immune cells or antibodies from another individual
- Immunological Memory
 - Generation of memory T cells and B cells during activation phase
 - Subsequent encounter w/ pathogen, memory cells make a faster, more vigorous, qualitatively different/better response
 - Basis of vaccination
- Most of the time, active immune response desired w/ notable exceptions
 - Transplantation
 - Allergy
 - Autoimmune disease
- Characteristics of Immune Response
 - Specificity of recognition
 - Diversity of recognition
 - Memory/secondary responses
 - Tolerance