Review sheet: Immune System

Lymphatic system – structure and function
- List the major components of the lymphatic system and their functions
- What is lymph? Describe how it flows through the body.
- Know the 2 primary lymphatic organs and their functions.
- What are the roles of the lymph nodes, spleen and lymphatic nodules in immunity?

Nonspecific immunity (or innate immunity)
- Describe the components of the first line of defense (external barriers)
- Know the roles of the nonspecific internal defenses
  - Antimicrobial proteins: interferons, the complement system
  - Lymphocytes: natural killer cells, macrophages, neutrophils
  - Inflammation
  - Fever

Specific immune mechanisms (or adaptive immunity)
- What two properties distinguish the nonspecific and specific defenses?
- Vocabulary: antigen, antigen receptor, epitope and antibody.
- Specific immunity involves B cells and T cells. How do these cells differ?
- How do B and T cells develop immunocompetence?
- Describe the two types of mature T cells that exit the thymus.
- Explain clonal selection. Distinguish between the two types of cells in the clone: effecter cells and memory cells.
- How is it possible that human immune cells can recognize over a billion epitopes?
- What is the role of major histocompatibility complex (MHC) antigens?
- Diagram the general pathways of antigen processing and presentation.
- What is the role of cytokines in the immune response?

Cell-mediated immunity
- What kinds of cells are involved in cell-mediated immunity?
- What cell surface marker proteins are associated with T_H and T_C cells?
- Describe the activation of T cells. What is the importance of costimulation?
- For helper T cells: describe antigen recognition, T_H cell activation and release of cytokines. What are the roles of activated T_H cells in the immune response?
- For cytotoxic T cells: describe antigen recognition, T_C cell activation and antigen destruction.
- Distinguish between the action of natural killer cells and cytotoxic T cells.
- What is immunological surveillance? What cells are involved?

Antibody-mediated immunity
- Describe B cell activation and clonal selection. Is costimulation involved?
- Describe the role of plasma cells in antibody secretion.
- List the structural characteristics and actions of antibodies.
- Explain how the complements system operates
- Distinguish between a primary and secondary response to infection.
- Explain how vaccinations work.