**Questions to answer:**

1. Why are defense systems needed in multicellular organisms?
2. Explain the physiological structures in vertebrates that serve each of the following defense purposes:
   1. Barriers
   2. Traps
   3. Elimination
   4. non-specific patrolling cells
3. How is immunity acquired during a vertebrate’s life cycle?
4. Compare B-cells and T-cells.
5. How is it possible that functionally infinite variations of antibodies can be made from one set of genes?
6. Explain the role of Helper T-cells in the immune system.

**Things you should make sure you understand:**

**(feel free to ask questions about them in class)**

* The defenses of bacteria, plants, invertebrates and vertebrates.
* The interplay between the vertebrate innate and adaptive immune systems.
* The process of how a specific immune reaction is developed and how specific immune defenses function.
* The causes, symptoms, and treatments of immune system disorders.
* How and why vaccines work (and why they don’t always).