Sequence of events, from entry of pathogen into the body to the formation of antibodies:

1. Bacteria enters tissue from a break in skin.
2. **Neutrophils/monocytes** = Phagocytic non-specific WBC in the blood stream.
3. **Monocytes** = Cell that extravasates from blood vessel into tissue. (is now called a **macrophage**)
4. **Macrophage** = Phagocytic cell in tissue, which finds pathogen, kills it, and puts antigen on its surface.
5. **Helper T-cell** = Cell of cell-mediated adaptive immunity, which becomes activated by interaction with the cell in #4 above.
6. Activated cell from #5 above can now activate these cells:
   A. **Cytotoxic T-cell** = Cell of cell-mediated adaptive immunity, which directly kills pathogen.
   B. **Memory T-cell** = Cell of cell-mediated adapted immunity, which keeps a memory of pathogen.
   C. **B-cell** = Cell that is part of antibody-mediated adaptive immunity.
7. Cell from 6C above can make **antibodies** (otherwise known as immunoglobulins)
8. Cell from 6C above encounters its pathogen and the following happens:
   A. "Throw" antibodies at pathogen's cause agglutination
   B. Clonal replication of plasma B-cells & memory B-cells

**Categories of Immunity:**

**Innate Immunity** (also called **non-specific immunity**)

1. External innate
   - **Barriers to pathogen entry**
     - **Skin**
       - **Tears** are antimicrobial
       - **Alveolar macrophages**
       - **Stomach acid**
       - **Acidic urethra/vagina**
   - **Macrophages**

2. Internal innate
   - **WBC's**
     - are phagocytic
     - secrete endogenous pyrogens
     - secrete cytokines, chemokines
     - can enter tissue as macrophage

**Adaptive Immunity** (also called **specific immunity**)

1. Cell-mediated
   - **(T-cells!)**
   - **helper T-cells**
   - **memory T-cells**
   - **cytotoxic T-cells**
   - **regulatory T-cells**

2. Antibody-mediated
   - **(B-cells!)**
   - **Plasma B-cells**
   - **Memory B-cells**

**Acquired vs. Natural Immunity:**

1. Acquired
   - **T-cells** secrete interferon
   - NK cells - toxic granules
   - Complement proteins can lyse bacteria
   - Mast cells secrete histamine

2. Natural
   - **Skin**
     - **Tears** are antimicrobial
     - **Alveolar macrophages**
     - **Stomach acid**
     - **Acidic urethra/vagina**
   - **Macrophages**