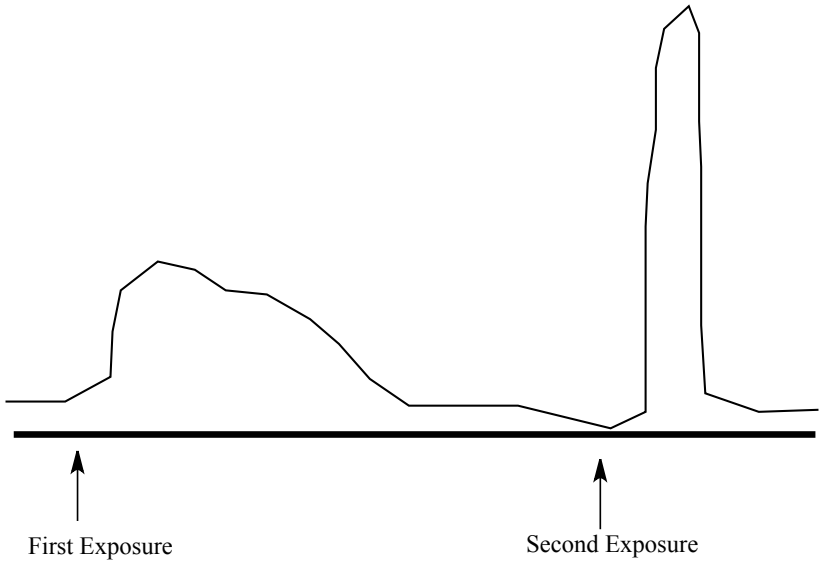
CONCEPT: B CELL DEVELOPMENT

- **B cells** are antibody producing cells
  - □ They are _____, and produce only one type of antibody
    - Further, this antibody is targeted towards one **antigen**, which is a specific pathogenic sequence
  - □ B cells shouldn't produce antibodies against the host
    - **Self-tolerance** is the ability of an animal's immune system to not respond to its own cells
    - *Autoimmune diseases* arise when the immune system begins attacking itself
  - □ Vaccination works by _____ B cells
    - **Primary immune response** is a smaller immune response that occurs during the first exposure (vaccine)
    - **Secondary immune response** is a much larger immune response during the second exposure

EXAMPLE:



- The **clonal selection theory** explains the maturation of B cells
  - □ This theory states that the body creates many B cells targeting many pathogens, but activates and amplifies only the B cells that can respond to the pathogens the body actually encounters

1. B cells produce one antibody type in absence of antigen exposure (**naïve cells)**

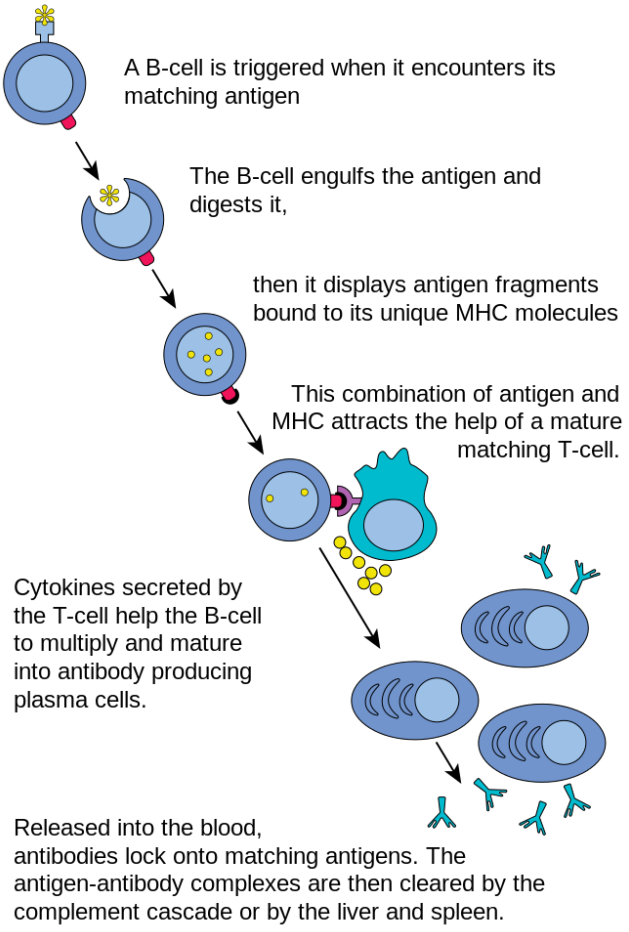
2. The body is exposed to a pathogen

3. The B cell that can respond to that pathogen becomes activated (**effector cells)**, and begins proliferating

4. The B cell produces lots of antibody against that pathogen, eventually destroying it

5. A few of these B cells become **memory cells** and are stored incase of second exposure

EXAMPLE:



PRACTICE:

1. True or False: Each B cell produces only one antibody which targets only one pathogen.
    a. True
    b. False

2. A B cell that becomes activated in response to a pathogen is called what?
    a. Naïve B cell
    b. Effector B cell
    c. Memory B cell
    d. Activated B cell

3. Which immune response is stronger?
    a. Primary immune response
    b. Secondary immune response
    c. Tertiary immune response
    d. Self-tolerate immune response