

Adaptive(Acquired) Immunity

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Immunology

Adaptive immunity

Characteristic features

- **Antigen specificity**
- **Diversity**
- **Immunologic memory**
- **Self-nonsel self recognition**

Adaptive immunity

Antigen Recognition by Lymphocytes

- **WBC's produced in the bone marrow**
- **circulate in blood and lymph**
- **Reside in lymph node**
- **Produce and display receptors that recognize foreign particles.**

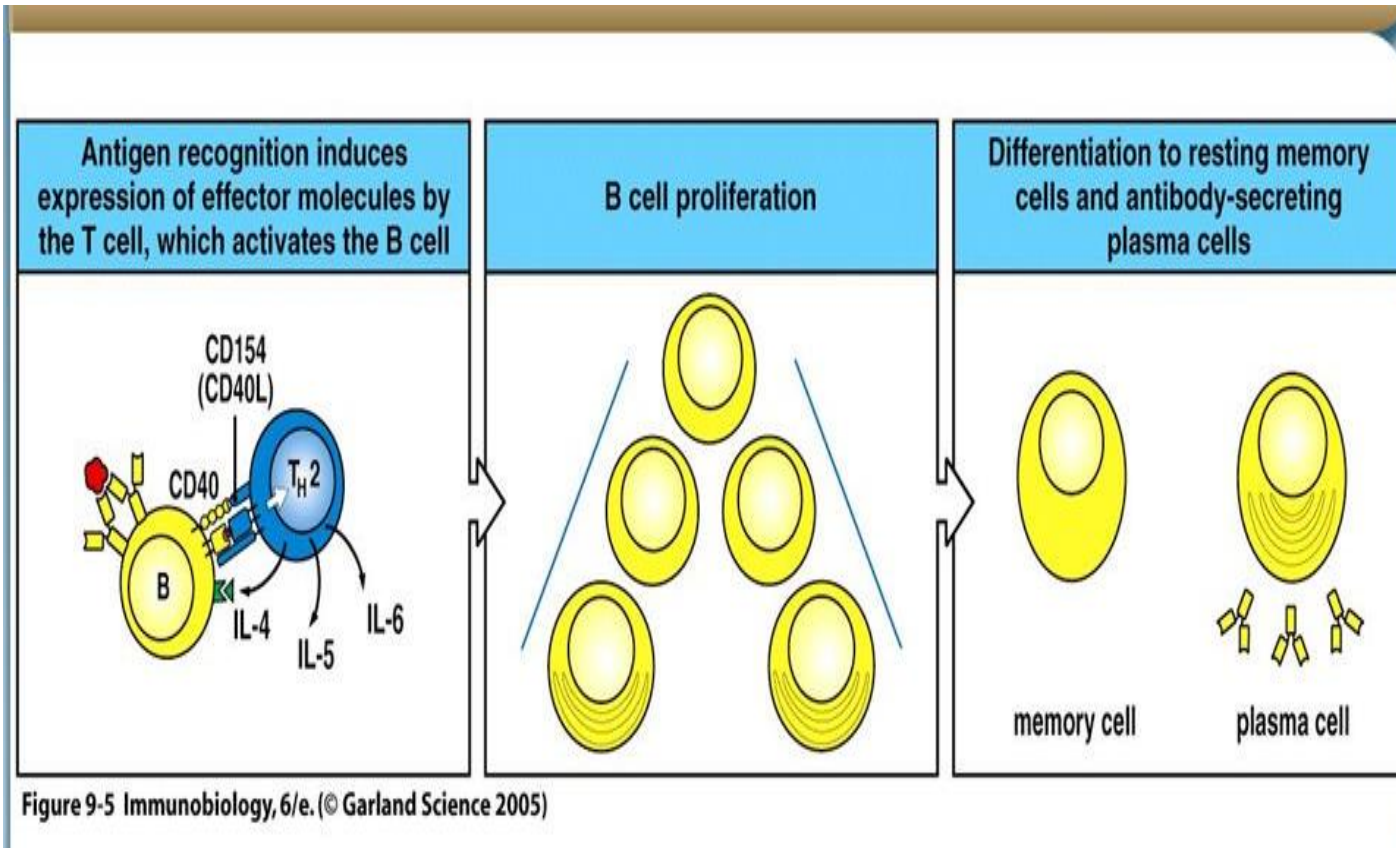
Humoral immunity

- Immunity that mediated by antibodies is termed humoral immunity.
- It is particularly effective against toxins (exotoxins), whole bacteria, and free viruses (i.e, viruses not currently infecting cells).
- Reside in lymph node
- Humoral immunity depends first on the ability of B lymphocytes to recognize specific antigens and second on their ability to initiate responses (antibody production) that protect the body against foreign agents.

Humoral immunity

- A B cell produce only a single kind of antibody. These antibodies are displayed on the surface of B cells.
- The binding of an antigen induces B cells either to start producing antibody (plasma cell) or to differentiate into cells that retain memory (memory cells).

Humoral Immune Response



Humoral Immune Response

Primary response

- upon initial exposure to an antigen that a body has never been exposed to, there is a 10 to 17 day lag before the peak in antibody (particularly IgG).

Secondary response

- The second exposure activates memory cells and there is only a 2 to 7 day lag before the peak in antibody (particularly IgG) concentration.

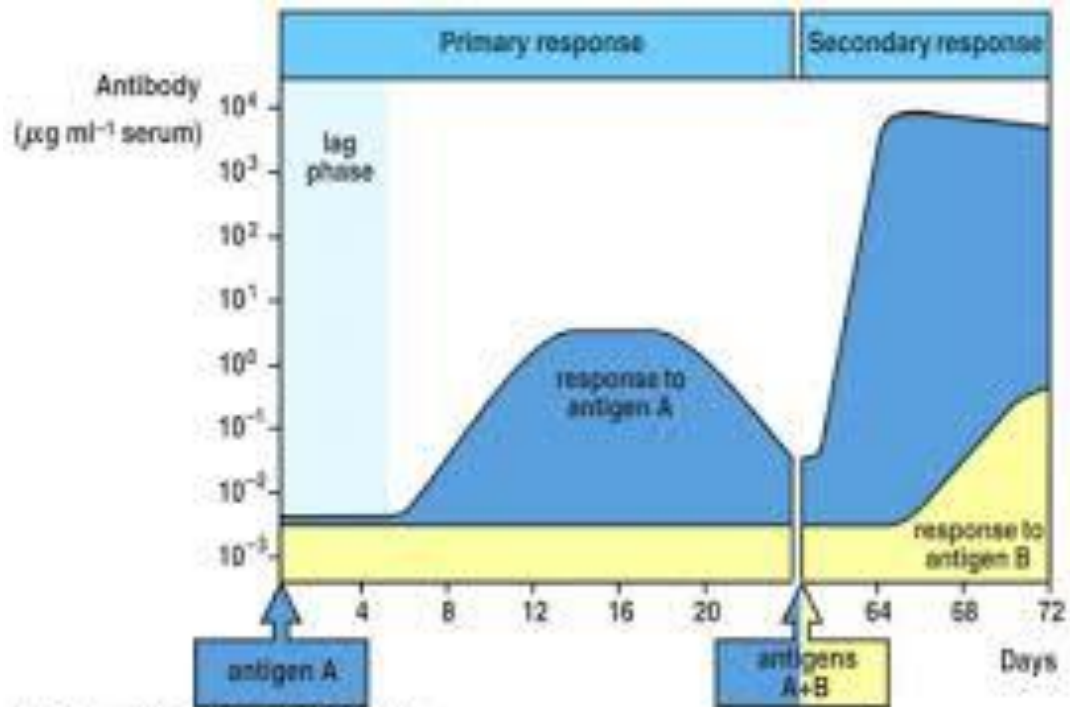


Figure 1.28 Immunobiology, 4th ed. Garland Science 2003

Cell Mediated Immunity

- **It is conferred by cells rather than via secreted proteins ie., antibodies**
- **It is particularly active against virus infected cells, though it can also function against other eukaryotic cells.**
- **It is mediated by cytotoxic T lymphocytes.**

Cell Mediated Immunity

- **Cytotoxic T cells act by first recognizing that other body cells are infected, and then killing those cells.**
- **This recognition is made possible by MHC1 molecules that capture enzymatically chopped down pieces of foreign protein and present it on the surface.**
- **This cell killing by the host immune system is one means by which virus infections damage hosts and thus cause disease.**

CD4 + T cells

Th1 cells activate macrophages to become highly bacteriocidal.

Th1 cells coordinate the host response to intracellular pathogens, like tuberculosis.



Th2 cells provide B cell help and promote antibody responses.

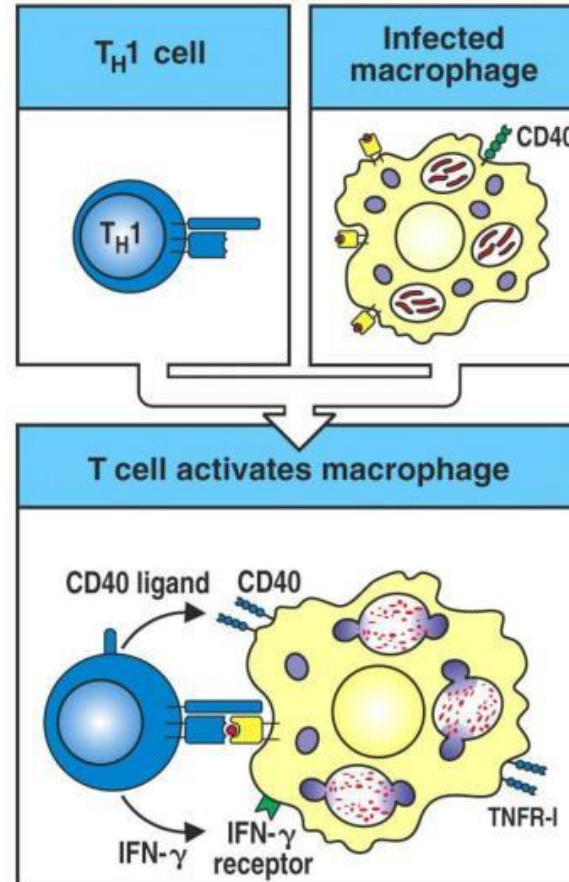


Figure 8-39 Immunobiology, 6/e. (© Garland Science 2005)