

### **Viewing Guide: Nonspecific Immunity**

Go to: <http://www.sumanasinc.com/webcontent/animations/content/inflammatory.html>.

1. What is meant by nonspecific immunity?
2. What triggers the nonspecific immune reaction?
3. What do mast cells release into the area surrounding the splinter?
4. Why do areas like with histamines in them become red and swollen?
5. What effect do medications that are antihistamines generally have? (Not listed on the tutorial, but you can infer.)
6. Following a histamine response, what proteins are released into the affected area? What do these proteins attract to the area? From the name, what do phagocytes do?
7. What causes the area to return to normal?
8. Many phagocytes are antigen-presenting cells. What is meant by an 'antigen-presenting cell'? How do antigen-presenting cells serve as a way of connecting the innate (phagocyte) and adaptive immune systems?

## Adaptive Versus Innate Immunity

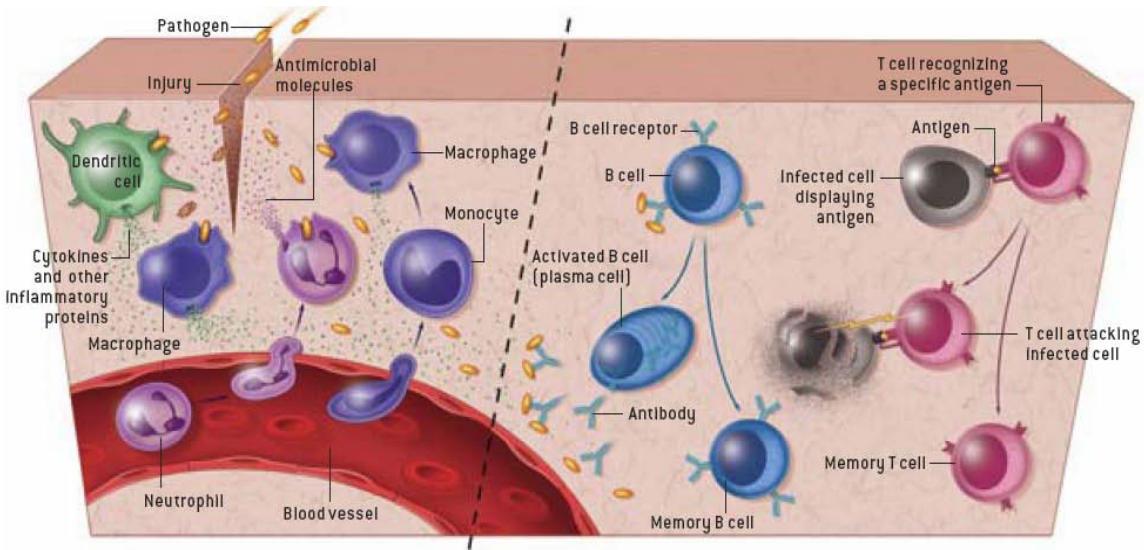


Image adapted from: L.J. Oneil (2005). *Immunity's Early Warning System*. *Scientific American*

Please use the image above to answer the following:

1. On the appropriate side of the dotted line above, label the diagram with 'Innate Immune System' and 'Adaptive Immune System.'
2. Provide a brief description of what is happening on the Innate Immune System side.
3. Provide a brief description of what is happening on the Adaptive Immune System side.
4. How is the innate immune system communicating with the adaptive immune system? How else is the adaptive immune system recognizing and responding to the pathogen?
5. List three differences between innate immune cells and adaptive immune cells, and the adaptive immune system and innate immune system. What are the evolutionary advantages and disadvantages of each?

## **Viewing Guide: Immune System**

[http://kidshealth.org/kid/htbw/\\_bfs\\_ISmoviesource.html](http://kidshealth.org/kid/htbw/_bfs_ISmoviesource.html)

1. "Leukocyte" is another word for white blood cells. What is the function of the immune system?
2. What are the four type of pathogens (disease-causing organisms) mentioned?
3. What is the example given for each?
4. Why do viruses need to invade cells?
5. What are the five steps involved in immune response?
6. What does the macrophage do to the invading virus?
7. How are invaders identified? What is an antigen?
8. What is the function of Helper T cells? How do they call for "backup"?

9. What do B cells do?

10. What are antibodies? What do they do?

11. What do the killer cells do to the cold virus once it's tagged with antibodies?

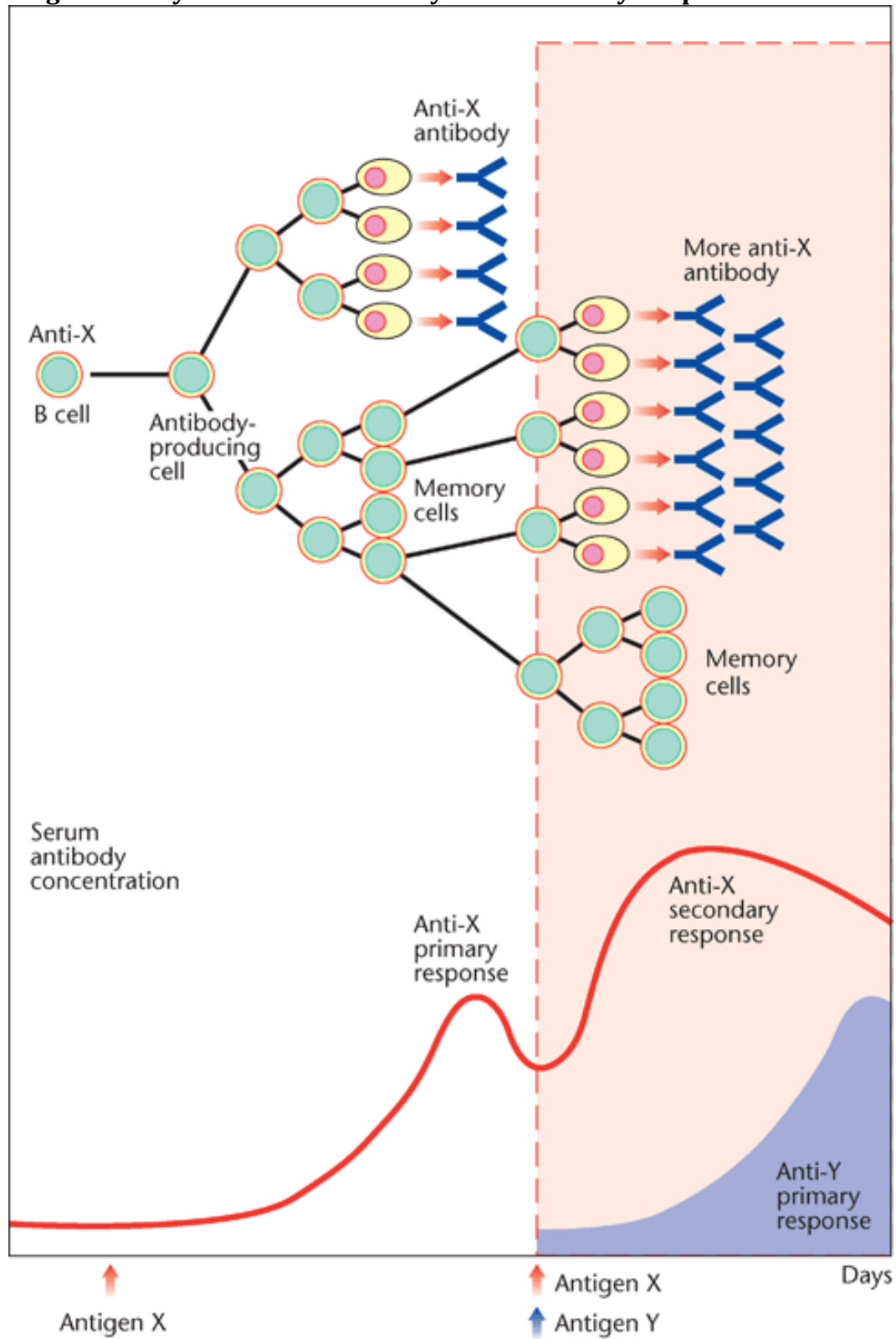
12. What happens when a virus successfully invades a cell?

13. What do cytotoxic T cells recognize? What do they do?

14. Why can the cytotoxic T cells destroy the cell safely?

15. What are memory cells? What do they do?

### Diagram Analysis: Immune Primary and Secondary Response



1. What is the relationship between exposure to antigen X and the serum antibody concentration?
2. Describe the events that lead to the initial differentiation/maturation of B cells in response to antigen X as the body's anti-X primary response.
3. Describe the secondary response to antigen X. How does the response differ compared to the primary response?
4. Why can the body respond more quickly and efficiently to antigen X during the secondary response than during the primary response?
5. Why does the response to antigen X differ from the response to antigen Y?
6. Based on your observations of the primary and secondary immune response, explain the action of vaccines in terms of preventing or ameliorating disease.
7. Based on your observations of the primary and secondary immune response, explain why it is necessary to manufacture and administer a new flu vaccine each year.