

Name:

Date:

Class:

Pre-Assessment Answer Key

Antibodies, Antigens, and Basics of the Immune Response

1. What is the role of B cells in the immune response?
B cells recognize antigens and produce free antibodies that circulate in the blood to recognize one particular antigen.
2. How do B cells recognize a foreign antigen or pathogen?
B cells have receptors on their membranes that are specific to one antigen. The receptor has a shape that is specific to the antigen.
3. What do all antibodies have in common? How do they differ from one another?
Antibodies are proteins produced by immune cells, and their job is to recognize an antigen and attach to it. All antibody types have a variable region that is different, so that each can recognize and be specific to one antigen.
4. What are antigens? Why might we need to measure the concentration of an antigen?
Antigens are molecules recognized by the immune system as foreign, and they activate the immune system to generate antibodies. The concentration of an antigen in the body may be related to a disease. Measuring the antigen concentration can provide information about the progression and severity of a disease.
5. What role do antibodies have in our bodies? What role do they play in immunoassays?
In our bodies, antibodies attach to antigens to neutralize them and tag them for destruction by specialized immune cells. In immunoassays, antibodies are used as a tool to detect antigens and measure their concentrations.
6. Based on your understanding of how immunoassays work, describe one engineering challenge in the development of devices used to measure antigens and antibodies.
Answers will vary.

Students may predict some of these challenges:

- Antibodies may not bind to the materials on a device or platform.
- Sometimes antibodies can have an affinity to a different antigen, which may interfere with results.
- Antibodies and other signal molecules such as enzymes and substrates may not work well in the environment of a device.