Fighting Infections with Your Immune System

Name: _____

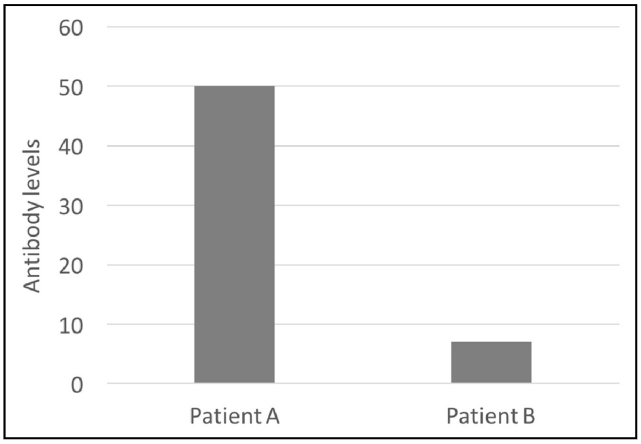
Date: _____

Student quiz —Answer key

Directions: Circle the best answer for the multiple-choice question(s) below. Write your answer for the other question(s).

1. What do antibodies do with pathogens?
   a. They destroy their cell walls
   b. They attach to them
   c. They change their binding site
   d. They ignore them

2. The graph at right shows antibody levels in two different patients who have just been infected with the same pathogen. Assume that all patients develop the same number of antibodies during their primary or secondary immune response. Which patient do you think just got the disease for the first time? Explain your answer.



Answers may include, but are not limited to following:

Patient B just got the disease for the first time as his/her antibody levels are much lower than Patient A's. This indicates that he/she is going through a primary immune response, where it takes longer to produce antibodies for a specific pathogen. This happens because there are no memory cells present that can remember the pathogen. Patient A has been infected by the same pathogen before, which lead to the creation of memory cells that can produce antibodies much faster during a secondary immune response.

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Directions: Circle the best answer for the multiple-choice question(s) below. Write your answer for the other question(s).

3. What function do memory cells have in our body?
   a. They help our immune system remember pathogens
   b. They store information in our short-term memory
   c. They send chemical signals from our blood to the brain
   d. All of the above

4. Why are vaccines important?
   a. They protect us from all pathogens
   b. They increase the amount of red blood cells in our body
   c. They decrease our immune response when we get sick
   d. They provide immunity to certain diseases

5. You repeat an experiment similar to what you did in class, where salt represents the body's cells and iron filings represent pathogens, but find a way to measure their masses separately. The results of two different simulations are shown in the table below.

Simulation	Mass iron filings [g]	Mass salt [g]
1	7.9	0
2	4.2	3.8

Explain in your own words which of these simulations represents someone with an autoimmune disease, and why.

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Answers may include, but are not limited to following:

Simulation 2 represents an immune response in a person that has an autoimmune disease. The results show that a lot of salt got attached to the magnet, which mimics the body's regular cells being bound by antibodies. An autoimmune disorder means that our immune system cannot differentiate between pathogenic cells and our body's cells anymore. This causes antibodies to bind to human cells, which can lead to their destruction and infections. In a functioning immune system, only pathogens should be fought, which is the case in simulation 1 where only iron filings (pathogens) are attached to the magnet (antibody).