

### Assignment

#### Questions:

1. What would happen if blood type A was transfused into people with blood types A, B, O, and AB? Provide an explanation for each case.

Donor.  
A - A antigens  
B antibodies

Recipient.

- B - A antibodies  
- will reject + attack A Blood
- AB - ~~A+B~~ no antibodies so it will accept A blood.

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# 7 (and give an explanation)

A - has A antigen  
and B antibody.

O - A + B antibodies  
so it will attack  
the A antigens

#8 (and give an explanation)

Blood group 3  
A + B antigens  
no antibodies

(A)

## Section 11.3 Questions

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1. An allergy is a mistake by the immune system in which a harmless agent is identified as being harmful. The immune system's overreaction becomes dangerous.
2. If you are allergic to peanuts, your immune system believes that one of the peanut proteins is dangerous. Although the protein is safe, your body mobilizes the production of antibodies against the peanut. Increased tissue swelling and mucus secretion and, sometimes, constricted air passages are all part of the immune response. A severe allergy can cause an anaphylactic reaction. Symptoms of this type of reaction are hives, swelling of various parts of the body, and itching. During this type of reaction, the body believes that it is in danger and cells release bradykinin, which stimulates the release of histamine. Histamine can cause swelling of tissues and a decrease in blood pressure.
3. Epinephrine increases the heart rate, compensating for the drop in blood pressure caused by anaphylactic shock or a severe immune response.
4. The immune system attacks cells of the body as if they were foreign invaders. Many researchers believe that most people have mutated T cells and B cells that are capable of attacking the body; however, the renegade cells are usually held in check. The suppressor T cells play an important role in recognizing and intercepting the renegade T and B cells. One theory suggests that the suppressors secrete a substance that tells the macrophages to engulf the renegade cells.
5. We know that the number of suppressor T cells declines with age, increasing the incidence of rheumatoid arthritis and other autoimmune diseases. Drugs and serious infections can weaken the suppressor T cells and leave the body vulnerable to autoimmune diseases. Some individuals are born with defective suppressor T cells, and they battle autoimmune diseases such as lupus, rheumatic fever, and type 1 diabetes throughout their lives.
6. Donor organs must be matched to the recipient to reduce rejection of the donated organ by the recipient. The donor organ is usually identified by the body as an invader, and the immune system tries to destroy it. Immunosuppressive drugs are usually given to the patient to reduce the chance of rejection occurring.
7. Students' answers will vary depending on the disease that they research.
8. Histamine puts the body's defence system into action. Capillaries dilate, and white blood cells rush to the allergy-causing invader. Fluids rush from the capillaries, and blood pressure drops. Histamine causes the air passages to constrict, and less air moves in and out of the lungs. Histamine causes the stomach to increase gastric secretions.

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## Section 10.4 Questions

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1. The movement of water between blood and the ECF is regulated by fluid pressure and by osmotic pressure. Water moves from an area of high fluid pressure, the capillary, to an area of low fluid pressure, the ECF. Proteins and dissolved minerals in the blood cause fluid from the ECF to move back into the blood by osmosis.
2. The balance between osmotic pressure and fluid pressure is upset during hemorrhage. The decreased blood volume lowers blood pressure. The force that drives fluid from the capillaries diminishes, but the osmotic pressure, which draws water into the capillaries, is not altered. Although proteins are lost with the hemorrhage, so are fluids. Fewer proteins are present, but the concentration has not been changed. The force that draws water from the tissues and ECF is greater than the force pushing water from the capillary. The net movement of water into the capillaries provides a homeostatic adjustment. As water moves into the capillaries, fluid volumes are restored.
3. Individuals who are suffering from starvation often display tissue swelling, or edema. Plasma proteins are often mobilized as one of the last sources of energy. The decrease in concentration of plasma proteins has a dramatic effect on osmotic pressure, which draws fluids from the tissues and ECF into the capillaries. The decreased number of proteins lowers osmotic pressure, thereby decreasing absorption. More water enters the tissue spaces than is pulled back into the capillaries, which causes swelling.
4. Lymph vessels are a system of open-ended vessels that collect proteins and debris from the ECF. Lymph vessels are similar to veins, and lymph is a fluid similar to blood plasma. Eventually, lymph is returned to the venous system.
5. Lymph is a fluid found outside capillaries and contains some small proteins that have leaked through capillary walls. Lymph is transported in open-ended lymph vessels that are similar to veins. The low-pressure return system operates by slow muscle contractions against the vessels, which are supplied with flaplike valves that prevent the backflow of fluids. Eventually, lymph is returned to the venous system.
6. They are white blood cells that are involved in producing antibodies.
7. The spleen is a lymphoid organ that acts as a reservoir for blood and a filtering site for lymph.