

## Biology (B3A) Assignment Human Disease and Their Control

follow up questions

1a) When people refer to pathogens, they are talking about bacteria that cause disease.

1b) The toxins actually excreted by the pathogens are the main cause of diseases although the toxins are only by-products of the pathogen's metabolism.

2a) In most cases, the toxins excreted by the pathogens find their way into the circulatory system. Thus, sometimes, the infection is caused somewhere else from where the toxins were excreted. An example of this would be Rheumatic fever. The toxins that cause this disease is excreted by the pathogen as a by-product of metabolism. Usually, the pathogens that cause rheumatic fever is located in the throat. As the toxins enter the circulatory system, it travels along the system and eventually causes an infection in the heart valves.

Yet another example of where the disease is in a different location than where the toxin was released is Diphtheria. The pathogen that causes Diphtheria is usually located in the throat. As the toxin is released, it travels all the way to affect limb muscles and the heart.

2b) Examples of where the disease is at the site of the bacteria could be Tetanus and Tuberculosis. The tetanus bacteria releases a deadly toxin which can affect the whole body which causes paralysis. As it affects the whole body, the disease would most likely be caused at the location of the bacteria. This disease will not always paralyze your whole body but most of the time, it would paralyze your jawbone. Thus tetanus is also known as lockjaw. Tuberculosis as a disease that affects the lung cells. The toxins also affect the lung cells. Therefore, the pathogens for tuberculosis could be found near the site of disease.

3a) In our environment, we encounter all sorts of micro-organisms. Sometimes these air-borne diseases are pathogens and could cause and make one sick. Examples of air-borne pathogens that cause diseases are the ones that cause whooping cough, scarlet fever, and the mumps.

3b) An example for this kind of transmission would be the kind of pathogens found in feces. Typhoid fever is one of the kinds of diseases that are transmitted through water as these pathogens are found in feces. The feces released would sooner or later find its way back into drinking water. Then, as the pathogens enter the drinking water, they come out and just like float around until a new host comes. When the new host comes and drinks from the water source, the pathogens take this opportunity to enter the host. Once the pathogens enter the body, the host would be infected.

4a) Besides transmitting disease through everyday drinking water and the air, another way of transmitting diseases are by contact. Chicken Pox and Small Pox are some of the many diseases that can be caused by contact.

4b) Veneral diseases like gonorrhea and syphilis can also be transmitted by contact.

5a) An example of a disease that can be transmitted if there is a wound would be our very familiar Tetanus. An example of how someone would acquire tetanus from a wound would be like this:

The construction worker moves around a lot and works very hard. Down on the floor is a tetanus infected nail. As the worker is too busy caring for his job, he accidentally steps on the nail and gives the tetanus bacteria a chance to get into the body. The tetanus would be successful from coming from the nail and going to the host. As the wound would close very quickly, this provides an oxygen free atmosphere in which the tetanus bacteria could start to get active.

6a) Immune carriers can be classified as those who have recovered from a certain disease and is immune to it, but still carries the pathogens. The immune carriers show no indication of a disease with no symptoms, but this carrier can still transmit these pathogens to others.

6b) One major disease carrier is the Anthropod. They pick up the pathogens in their food, where they walk and other places. As they carry the disease, they move to other places either for food or shelter purposes. When they bite or sting other organisms, the disease is transmitted through the anthropod and infects a new host.

7) The skin is the main protector from pathogens. The first line of defense is the structure of the skin itself. It is almost impossible for pathogens to pass the skin layer. Those who do would go through the pores in our skin. The second line of defense would try to stop those who try to enter the pores. The skin sweats which contains salt. These salts kill of most of the pathogens that enter the pores. Finally, if the pathogens are still luckily enough to get in, the body excretes a line of mucus. This mucus traps the pathogens. Besides this, the mucus also contains enzymes which also help destroy the pathogens.

8a) Some cells that engulf pathogens are known as phagocytes. This is so because the phagocytes engulf the pathogens through a special process known as phagocytosis. An example of a phagocyte would be blood cells known as leucocytes. The whole job of these leucocytes is to find and engulf disease causing bacterias. They travel along the bodily fluids to the area of infection.

8b) What many people refer to as Pus is actually the left overs of dead leucocytes and pathogens.

8c) Serious infections cause the swelling of the lymph nodes as there are too many dead leucocytes and pathogens to store for excretion from the body.

9a) Antigens are foreign proteins to the human body. In turn, these foreign proteins cause a reaction. Usually, the main cause of these foreign proteins would be toxins from pathogens or micro-organisms.

9b) When an antigen enters the body, a certain reaction occurs. When it has been found out that an antigen really is present, it causes the spleen and the lymph nodes to produce a substance known as antibody. This antibody is a specifically designed substance to track down and destroy the antigen.

9c) An antitoxin is a kind of antibody. This kind of antibody is specifically used to go after toxins released by these pathogens. Once the antitoxin locates the toxin released by harmful pathogens, the antitoxin would go and destroy it.

10a) The general definition of an immunity is the ability for an organism to confront pathogens that can cause diseases.

10b) Immunity can be acquired by inheriting it. Inherited immunity is with you when you are born and is usually passed down to you by your mother. Another name for an inherited immunity is "species immunity". This is sometimes true when the whole species would be immune.

10c) The definition for acquired immunity is the immunity acquired in time when you recover from diseases and gain an antibody for that particular disease. Acquired immunity could be with you when you are born.

11a) One of the main differences and the most important difference between active and passive immunity is that passive immunity is where the antibody is directly injected into the host causing immediate effect. Active immunity is where a small dosage of the pathogens have died or weakened before being injected into the body. This process of acquiring immunity is usually longer but the results most often would be permanent.

11b) Naturally acquired active immunity is when you get infected from your environment and in time you recover from it and gain an immunity.

Artificially acquired active immunity is when you get a vaccine from a clinic or hospital where you develop your immunity by a small dosage of the disease.

11c) Natural acquired passive disease can be gained from your mother when you are born. Where the antibody is directly passed onto to you. An artificially acquired passive disease would be when the doctor gives you an injection of an antibody for immediate effects to cure serious diseases.

12a) A vaccine is a way to acquire artificial active immunity. It is usually dead

pathogens or weakened pathogens. This dosage would not get you ill be just enough for you body to have reactions and make their own antibodies.

12b) A toxoid is a vaccine which consists of weakened toxins instead of the weakened or dead pathogens themselves.

12c) A serum is a substance used for artificial passive immunity.

13a) Antibiotics are something produced by an organism to prevent or slow down the growth of pathogens.

13b) Some commonly used antibiotics would be penicillin, erythromycin, streptomycin, neomycin, and terra mycin.

13c) The problem with antibiotics is that too much or over dosage would kill even the bacteria in our stomach and sooner or later, the pathogens would develop a strain which would not be affected by this antibiotic.