

# Transmisso, The Unknown Pathogen

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The human body does a number of things to protect it and to carry out essential functions everyday to survive. All the organs and systems will work together and help maintain homeostasis within the body. People encounter many different kinds of bacteria everyday, so the body must stay alert to make sure the dangerous ones do not stay inside the host longer than it already has. The immune system and its organs will play a very important role for protecting the body from pathogens. A pathogen is an organism that can cause diseases when it invades a host while trying to achieve its own goal. There are five different types of pathogens, extracellular bacteria, intracellular bacteria, viruses, parasites, and fungi (Mak & Saunders, 2006). If an individual infected himself with an unknown pathogen, the body's red blood cells and white blood cells will rush to the site of invasion and do what it can to protect the body. The body may not feel great, and person may start feeling sick while all the cells are fighting, but the body will work hard to restore it back to normal.

When an unknown pathogen, *Transmissio*, enters into a host, the body will react. At first, the body will react by giving out symptoms like a cold. The immune system will then be alerted and the immunity process will start kicking in. The human body has two levels of immunity. One level is the non-specific or innate immunity, which animals and humans both have. This means that the body will protect itself from foreign material which may be seen as harmful ("The Human Immune System and Infectious Disease", 2018). Innate immunity forms the first line of defense against invasion of pathogens. This immunity is usually the body's first response to an unknown pathogen entering inside the body. It is made up of barrier tissues, cells, and molecules ("How The Body Reacts To Viruses", 2020). Some examples of that would be the skin and the mucus membrane ("The Human Immune System and Infectious Disease", 2018). The barrier tissues are usually interacting with the outside environment, and they try to prevent pathogens

from entering the body. White blood cells are key cells in fighting off harmful pathogens. There are many different types of white blood cells that do specific functions throughout the body. The macrophages, dendritic cells, and the mast cells use innate immune receptors to recognize pathogens (“How The Body Reacts To Viruses”, 2020). These innate receptors will be able to bind to all kinds of pathogens, and then they will either engulf them or release/secrete different molecules to get rid of them. The second kind of immunity is called specific immunity or the adaptive immune response. This immune response is only found in vertebrates and attacks specific pathogens. This is the body’s defense for specific and repeated threats. This is great for future attacks because the body will be able to recognize and attack it quicker (“How The Body Reacts To Viruses”, 2020). Lymphocytes are important white blood cells for carrying out this response. The two important kinds of lymphocytes are T and B cells. These cells respond to antigens rather than just the pathogen as a whole. The human body has B and T cells specific to millions of antigens (“The Human Immune System and Infectious Disease”, 2018). B cells are considered essential because they are able to produce antibodies which will help the immune system’s memory. The antibodies will also be specific to the specific antigen. However, B cells are not the greatest at producing antibodies, and that is where T cells come in. T cells are able to aid in the process of making antibodies. They are able to provide a signal to let maturation begin (“The Human Immune System and Infectious Disease”, 2018). They can also kill pathogens, killer T cells, or aid other immune cells, T helper cells, as well. All of these cells will circulate through the blood and fight off any antigens that they encounter. There are also regulatory T cells that will be able to detect when the invasion/threat is under control and alert the other immune cells to stop attacking (“The Human Immune System and Infectious Disease”, 2018). There are many organs involved with immunity since many of the cells circulate through the

blood. Some organs and tissues that play an essential role in immunity are the thymus, bone marrow, lymph nodes, spleen, appendix, tonsils, and Peyer's patches in the small intestines ("The Human Immune System and Infectious Disease", 2018).

Immune cells have many ways of traveling to fight off pathogens. As stated earlier, the immune cells as well as the antigens will travel through the blood system. Antigens will use that route since it travels throughout the body, which will help them achieve their goals faster. Lymphocytes also get released into the bloodstream to fight off all those traveling pathogens. The lymphatic system will also play a role on how immune factors will interact with pathogens. Lymphatic vessels are well known in aiding in immune response by delivering antigens (Liao & von der Weid, 2015). The lymphatic vessels have a few important roles in the human body. One of the roles is to maintain fluid balance. Fluid gets transported through the lymphatic vessels and will then be returned back into the blood circulation. They are also responsible for absorbing dietary fats, and most importantly, facilitate host's immune defenses. The pathogens or antigens that had engulfed pathogens will be sent to the lymph nodes for immune protection. This will trigger adaptive immune response to then produce antibodies and build memory against it (Liao & von der Weid, 2015). Before entering the lymph nodes, the antigens are separated by size. The smaller or double antigens are able to easily reach B cells. The larger ones are then captured by macrophages on their way to the lymph nodes. The spleen will then get rid of any blood-borne antigens, which are aided by B cells (Batista et al., 2016).

There are a number of ways to get rid of pathogens that makes one feel ill. A common and fast way is to take medication. However, in this case, a vaccine will do a better job since a pathogen is invading the human body. It will be more effective and it will be better at getting rid of the harmful pathogen in the future. Medication will only relieve some of the symptoms until

the body is finished fighting off the pathogen. The vaccine will help prevent the pathogen from invading again, and if it does, the cells will be able to recognize and attack faster next time.

However, getting any random vaccine will not help prevent or get rid of any harmful pathogen that could attack the body. If an MMR vaccine was to be administered to the individual that was infected with the unknown pathogen, it may not do much to help the body fight against the unknown pathogen. It will instead protect and fight against Measles, Mumps, and Rubella. The MMR vaccine is known to protect against those three diseases plus also chickenpox as well (“MMR Vaccination”, 2019). If the individual is already feeling symptoms from *Transmisso*, getting the MMR vaccine is not advised. The CDC advises that if someone is moderately ill, they should postpone the MMR vaccine until they are feeling better. Also if the infected individual also has received a vaccine in the past four weeks, then they should wait as well. Too many vaccines given in a short amount of time will decrease the effectiveness of all the vaccines overall (“MMR Vaccination”, 2019). So if the infected individual received the MMR vaccine, it may make their symptoms worse because of the weakened live virus in the vaccine.

The human body does a numerous amount of things to keep regulating homeostasis. It is always working during all times of the day, and all the organs and functions work together to make it happen. When someone becomes ill from a harmful pathogen, the blood cells in the body will come to fight and filter out all the bacteria it comes in contact with. The organs will then come in and help the blood cells travel to their targets quicker, and also help out with the filtering of engulfed bacteria. B cells and T cells will also come into play to create a memory of the pathogen attacking the body and produce antibodies. This will help in the future if the individual ends up contracting the same disease. The body will then be prepared and will be able to fight quicker and more efficiently. Vaccines will also help with the memory process of

defending against pathogens. The body will be on alert and be prepared to fight. Slight feverish symptoms may appear however since the vaccine contains a weakened version of the virus.

When an individual becomes sick, the body will do whatever it can to bring it back to its normal state.

### References

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