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| Most of these Helper T-cells play very important roles all throughout the body, but there are places where their attendance is severely mandatory. They are almost always located in regions of the body called the Reticuloendothelial System, also known as the RES. The RES consists of structures such as the liver, spleen, intestines, lymph nodes, bone marrow, and lungs. (5) The RES is considered to be the areas of the body that clean out harmful waste that could do horrendous damage. These areas are prone to have a high risk of cancer, because of rapidly dividing cells. Which is why the quantity of T-cells is so high in the RES, to prevent the possibility of cancer and disease.  There is also the Complement system. Complement can kill an invading bacteria or an infected cell on sight. It attaches itself to the surface of the target cell, allowing any certain macrophage or neutrophil to come destroy it. It can also literally poke holes in the cells membrane. This will cause the cell to flood and burst, which will destroy the cell immediately being a very effective way of fighting off disease.  One of the biggest problems for the immune system is cancer. Cancer comes in so many different forms and can infect some many different parts of the body. These abnormally shaped cells will divide very rapidly and literally take over the body�s normal cells. Leukemia is the most common form of cancer we know of today. It is a dramatic transformation within blood cells causing quite abnormal changes in bone marrow and lymphoid organ cells. (6) Yet they can also transform cells all throughout the RES region. There are about five different types of leukemia, and they all pretty much dominate over the immune systems helper T and B-cells. This makes cancer very hard to treat, but treatment for cancer has greatly improved with the last few decades making the performance of our immune system much more efficient.  There are many other hurdles that the immune system has to jump through. There is never a free ride anywhere. Viruses are one of our immune systems greatest of foes. They are not alive and are not active until they make contact with a host cell. Once they release their genetic information into the cell, the multiply and overpower the cell until it ruptures and releases more viruses throughout the body. Some very common viruses today are influenza and the common cold virus. Since we are pretty much exposed to viruses like this almost everyday, our bodies can easily identify them and destroy them before there is any real chance of infection. Yet often times, the body will come in contact with a virus that it has never seen before. The virus easily tricks it because it is doing what it normally does, infecting cells and multiplying. But the cells that these viruses go after are specifically the T and B-cells. Because of the lack of these cells, there are no antibodies produced to destroy these foreign invaders. This will often lead to severe illness and in most cases death to the host organism. Some examples of these viruses are HIV (AIDS) and Hepatitis (which specifically attacks the liver our main source of metabolism also called RES), which are often referred to as Sexually Transmitted Diseases or STDs. Cures are so difficult to find for these diseases because of their ways of attack upon our cells.  Naturally with disease comes science, and with science comes technology, and with technology comes cures for many of the diseases we know of today. We have cures for many bacterial and viral infections. Antibiotics are what we have to help the immune system kill off invading bacteria. And we truly have no man made cures for viruses, but we do have what is called a vaccine. Vaccines are meant to trick the immune system, but in a good way. Every virus has a defined protein shell or coat. A vaccine is a copy of a specific shell of a specific virus. It is injected into the body and immediately seen as a foreign invader. T and B-cells are frantically at work trying to destroy this potential threat. Once they have done their job, the immune system has a memory of this, and if the actual virus invades it, it will easily dispose of it. Therefore the host easily avoids infection. As for the viruses we have no cures for, it�s because they attack the very cells we have to fight off these viruses are they will lie in dormancy awaiting the body to go through an immediate stage of excitement or stress which will trigger them to be active once again.    ([Intro1](http://docs.google.com/introduction.html))([Intro2](http://docs.google.com/intro2.html))([Intro3](http://docs.google.com/intro3.html))([Intro4](http://docs.google.com/intro4.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2002 Projects](http://docs.google.com/AP2002/index.html)][[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |