

Biology Essay

HIV Prevention and Transmission

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Viruses are unique in that they have been classified as both living and nonliving, the reason for this is that they cannot reproduce without a host cell. Also they are acellular, which mean they don't have cells¹. There are many different viruses, our body can fight most of the viruses but there are some that we cannot even fight with medics. HIV, Human Immunodeficiency Virus, is one of those.

We still don't know how HIV evolved but there are a number of theories. One thing we know is that HIV probably evolved in Africa. The most commonly accepted theory is the "hunter theory"². The SIV, Simian Immunodeficiency Virus, was transferred to humans as a result of chimps being killed and eaten, or their blood getting into cuts or wounds on a hunter. Normally a hunter's body could have fought off the SIV, but in a few cases it adapted to its new human host and evolved into HIV. The Contaminated Needle Theory is an extension to this hunter theory. In Africa the enormous amount of needles needed to give inoculations and other medication would have been very costly. It is likely that one syringe would have been used to give multiple people injections without sterilizing the needle. This resulted in spreading HIV rapidly. One very interesting theory is the conspiracy theory, a significant number of African Americans believe that HIV was invented as part of a biological warfare program designed to wipe out large numbers of African Americans and Homosexuals. As we can see most of these theories claim that HIV evolved in Africa. However, none of these theories are 100% true and it is impossible to trace the source of HIV because it probably evolved years before we first identified the virus in 1959. Uncontrolled blood transfusion, drugs and travel all helped HIV spread all over the world.

Now let's see how HIV attacks our cells. The structure of HIV consists of three main parts, the genetic material, proteins and the envelope. The replication of HIV consists of a few steps. First is the fusion with the host cell, then HIV releases the viral proteins into the host cell and the reverse transcription starts, which mean the RNA from HIV is used to create the viral DNA, the reverse transcriptase enzyme does this. That viral DNA is then transported to the nucleus and is attached to the host DNA. Now the host cell crates new viral RNA which is used to make viral proteins. In the last step they all move together out of the cell and form a new HIV³. This cycle repeats all over again and again. HIV usually attacks the CD4 T cells, which is the cells that actually protects us from viruses, but the HIV destroys them and makes the person vulnerable to small diseases. We cannot heal the person after it is infected with AIDS (which is the result of HIV that destroyed many T cells) but we can only prolong their life with different medics, these medics strengthen up the immune system which can save the person for several years. So better protect than heal.

There are many ways of transmitting HIV, most frequent ones are through sexual contact, sharing needles, breast feeding and a lot more. The problem with HIV is that the symptoms may appear even after several years of having HIV. So many people think they don't

¹ "Viruses." *Biology*. Web. 19 Oct. 2011. <<http://biology.about.com/od/virology/ss/viruses.htm>>.

² *The Origin of HIV/AIDS*. *Meredith.edu*. Web. 19 Oct. 2011. <http://www.meredith.edu/kenya/baldwin_griffin.pdf>.

³ "HIV Replication Cycle." *Naid*. Web. 19 Oct. 2011. <<http://www.niaid.nih.gov/topics/HIVAIDS/Understanding/Biology/pages/hivreplicationcycle.aspx>>.

have HIV and during that time they can still infect others. To protect yourself you should have protection in sexual intercourse, never share needles, strict control of blood transfusion and never hide the fact that you have AIDS. Also HIV is not the one that kills the person, but the inability to defend from diseases as a normal flu.

AIDS has a great impact on our society, economy and many other things. We can clearly see that it effects our health and society, but I think that companies that sell condoms and medics that prolonging the life's of people infected by AIDS have an effect on scientists. The companies probably earn a lot of money and if we find the cure for AIDS the sale of condoms and those medics would dramatically fall. And today it is all about money, so AIDS have a huge effect on economy.

One of the biggest problems today is finding the cure for AIDS, I think we are close to that moment, considering how developed our science is. This would be a great step for science and the whole world. But for now, protect yourself and others.

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