**Possible Cure for HIV**

Acquired immunity syndrome, or AIDS, is still one of the most major public health problems. Over 35 millions people in the world are infected with human immunodeficiency virus, or HIV. Each year, over two million cases of HIV are reported worldwide. Antiretroviral drugs can control the infection, but those drugs do not cure the patient. If the HIV infection is not under control, the immune system weakens and results in AIDS. In recent, unsuccessful trials to exterminate the HIV-1 from the cell, a “shock and kill” approach was used. This approach tries to kill the infected cells called CD4+ T-cells.

Dr. Khalili has made a breakthrough in HIV/AIDS treatment. The scientist is preforming the experiment at the Lewis Katz School of Medicine at Temple University. In a recent study, Dr. Khalili and his team performed a new kind route in the treatment plan. They used a gene editing technology system that targeted the DNA of the HIV-1. This special system finds the HIV-1 DNA and a nuclease enzyme. It removes the entire HIV-1 genome spanning between 5’ and 3’ LTRs of the DNA copies from the infected CD4+ T-cells.

This is not the first study on the treatment of HIV/AIDS by Dr. Khalili. Previously, he created the technology that cut out the HIV-1 DNA from the human cell. However, in this most recent study, they not only focused on the infected CD4+ T-cells, but also the technology that can protect cells from a reinfection of the virus. In experiments in lab, patients infected with HIV gave their infected T-cells to research. The T-cells were then grown in cell culture. The results showed that the treatment with the new gene editing system in fact reduces the viral load in infected cells.

Dr. Khalili wanted to make sure that this new treatment would be safe for the patients. By using ultra-deep whole-genome sequencing, he studied the genomes of the HIV-1 cells for any damage or mutations in genes. The observations showed that there are no effects on genes and cellular gene expression. The cells were growing normally.

Although the researchers showed that the technology they used can safely eliminate the virus from the DNA of human cells grown in culture, there still needs to be more testing. The technology is so new that it needs to be preformed many times. Before this technology can help patients, there is a long list of regulations that must be followed. This study helped pave the way for future researchers. With this new information, a cure could be possible in actual infected humans.

Reference

Temple University Health System. "Scientists eliminate HIV-1 from genome of human T-Cells." ScienceDaily. ScienceDaily, 21 March 2016. <www.sciencedaily.com/releases/2016/03/160321135535.htm>.