

New HIV vaccine with gene alteration

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Editorial

US scientists have found a new approach to vaccination appears that protects monkeys from HIV (AIDS) completely. Human deficiency virus HIV is the most powerful infectious agents that kill people worldwide. Since 1981, about 78million people have been infected by the HIV virus which destroys immune cells and leaves the body exposed to tuberculosis, pneumonia and other opportunistic diseases. Thirty-nine million have died, according to UN estimates. In 2013 nearly, 1.5million people died from causes related to HIV globally.¹

The human immunodeficiency virus attacks the immune system and weakens the body sensors for discovery of infectious agents and the defense mechanisms. When the virus destroys the immune cells and affects the functions of the injured suffered immunodeficient aggravated gradually lead to increased exposure to a wide range of infections, some types of cancers and diseases that can be easily protected by healthy body system. Immune function is usually measured by the number of CD4 cells. HIV kills or damages the cells of the body's immune system, destroying CD4 positive (CD4+) T cells, a type of white blood cell vital to fighting off infection. The human immunodeficiency leads to increased susceptibility to a wide range of infections and diseases that can be for people with healthy immune systems overcome.²

The progressing phase of infection with HIV is Acquired Immunodeficiency Syndrome (AIDS), which may take a period ranging from two to 15years in order to appear on the patient. AIDS is known as the emergence of certain types of cancer or infections or other severe clinical symptoms. HIV is most often transmitted through unprotected sex with an infected person. AIDS may also spread by sharing drug needles or through contact with the blood of an infected person. Women with HIV can transmit it to their babies before or during birth or through breastfeeding.³ It is known that the vaccine trains the immune system to fight infection, but researchers at the Scripps Research Institute in California changed the DNA of monkeys in order to give the fight against HIV on the cells Properties.

In experiments reported in the journal Nature, the outstanding found that the four monkeys injected were protected even from very high levels of the simian form of HIV. The monkeys were protected for at least 34weeks and showed no sign of infection despite being administered with 16times the amount of virus required to infect a control group. This is may be described medically as "significant progress", which seeks to apply the tests on humans soon.⁴

This technique uses gene therapy to introduce a new part of the DNA to the healthy muscle cells. However there is no denying that Activation of the DNA-dependent cytosolic pathway is an important factor which plays an important role mounted by immune defense system against different microbes.^{5,6} This tape contains the DNA instructions for the manufacture of the tools needed to neutralize HIV, which is constantly pumped into the bloodstream virus.

Experiments showed that the monkeys have enjoyed protection from all types of human immunodeficiency virus for a period of 34weeks at least. There was also a protection against very high doses of the virus, or the equivalent amount of a new virus in newly infected patients. The researchers believe that this approach may be useful for people who are already suffering from the HIV virus. In this respect, Michael Farzan stated, a senior researcher in the study, "We are closer than any other approach for comprehensive protection, but we still have obstacles, are primarily in safety procedures when the policy is applied on a very large number of people".

It is worth mentioning, the vaccines for HIV experience problems because the virus mutates very rapidly and constantly changing target. This approach is aimed at areas that are difficult for HIV to change it. May be the real power of this approach is that it is more effective than any antibodies. However, there are some questions that relate to safety, after the traditional vaccination the immune system does not respond only after he felt a threat. The gene therapy approach works to transform cells into factories and industrial materials are constantly working to kill the HIV virus produces, but still the implications of that are unknown in the long term.

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Conflicts of interest

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