MAIL ONLINE

Does cholesterol hold the key to a vaccine against Aids? Scientists find way to stop HIV damaging the immune system  
  
  
Scientists have made a breakthrough they believe may offer a new hope in developing a vaccine against Aids.

Researchers from the United States and Europe have found a way to prevent HIV from damaging the immune system.

The have found it is unable to attack the immune system if cholesterol is removed from the virus's membrane.

'It's like an army that has lost its weapons but still has flags, so another army can recognise it and attack it,' said Adriano Boasso of Imperial College London, who led the study.

The team now plans to investigate how to use this way of inactivating the virus and possibly develop it into a vaccine.

Usually when a person becomes infected with HIV, the body's innate immune response puts up an immediate defence.

But some researchers believe HIV causes the innate immune system to overreact.

This weakens the immune system's next line of defence, known as the adaptive immune response.

For this study -- published yesterday in the journal Blood -- Boasso's team removed cholesterol from the membrane around the virus and found that this stopped HIV from triggering the innate immune response.

This in turn led to a stronger adaptive response, orchestrated by a type of immune cells called T cells.

Aids kills around 1.8 million people a year worldwide. An estimated 2.6 million people caught HIV in 2009, and 33.3 million people are living with the virus.

Major producers of current HIV drugs include Gilead Bristol Myers Squibb, Merck, Pfizer and GlaxoSmithKline.

Scientists from companies, non-profits and governments around the world have been trying for many years to make a vaccine against HIV but have so far had only limited success.

A 2009 study in Thailand involving 16,000 volunteers showed for the first time that a vaccine could prevent HIV infection in a small number of people, but since the efficacy was only around 30 per cent, researchers were forced back to the drawing board.

An American team working on an experimental HIV vaccine said in May that it helped monkeys with a form of the Aids virus control the infection for more than a year, suggesting it may lead to a vaccine for people.

HIV is spread in many ways -- during sex, on needles shared by drug users, in breast milk and in blood - so there is no single easy way to prevent infection.

The virus also mutates quickly and can hide from the immune system, and attacks the very cells sent to battle it.

'HIV is very sneaky,' Boasso said in a statement. 'It evades the host's defences by triggering overblown responses that damage the immune system.

‘It's like revving your car in first gear for too long -- eventually the engine blows out.

He said this may be why developing a vaccine has proven so tricky.

'Most vaccines prime the adaptive response to recognise the invader, but it's hard for this to work if the virus triggers other mechanisms that weaken the adaptive response.'

HIV takes its membrane from the cell that it infects, the researchers explained in their study.

This membrane contains cholesterol, which helps keep it fluid and enables it to interact with particular types of cell.

Normally, a subset of immune cells called plasmacytoid dendritic cells (pDCs) recognize HIV quickly and react by producing signaling molecules called interferons.

These signals activate various processes which are initially helpful, but which damage the immune system if switched on for too long.

Working with scientists Johns Hopkins University, the University of Milan and Innsbruck University, Boasso's team found that if cholesterol is removed from HIV's envelope, it can no longer activate pDCs.

As a result, T cells, which orchestrate the adaptive response, can fight the virus more effectively.

REUTERS

Scientists find way to "disarm" AIDS virus

Scientists have found a way to prevent HIV from damaging the immune system and say their discovery may offer a new approach to developing a vaccine against AIDS.

Researchers from the United States and Europe working in laboratories on the human immunodeficiency virus (HIV) found it is unable to damage the immune system if cholesterol is removed from the virus's membrane.

"It's like an army that has lost its weapons but still has flags, so another army can recognize it and attack it," said Adriano Boasso of Imperial College London, who led the study.

The team now plans to investigate how to use this way of inactivating the virus and possibly develop it into a vaccine.

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SCIENTISTS have found a way to prevent **HIV** damaging immune systems.

They say the discovery could offer a new approach to developing a **vaccine** against Aids.

Researchers from the US and Europe found **HIV** is unable to damage the immune system if **cholesterol** is removed from the virus's membrane.

This leaves the body better able to fight off the disease.

The teams now plan to investigate how to use this way of inactivating the virus to create a **vaccine.**

Aids kills 1.8 million people a year. Some 2.6 million caught **HIV** in 2009, and 33.3 million people live with it.