

Researchers stimulate AIDS antibodies

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French researchers have announced that, in laboratory conditions, they had stimulated antibodies that dramatically barred the AIDS virus from infecting human immune cells.

The results - the first time such a success has ever been achieved against such a wide genetic range of the virus - "open up interesting prospects for the development of a vaccine against AIDS", the team said in a press release.

"Twenty years after the human immunodeficiency virus [HIV] was identified, the AIDS pandemic is one of the greatest challenges to public health on a global scale.

"The need for a vaccine against HIV is thus greater than ever."

Antibodies are the molecular frontline forces in the body's defence system, designed to tag an invading virus or bacterium so that it is destroyed by immune cells.

Many vaccines, such as those against the flu, polio and measles, are based on antibodies, using a piece of the virus to prime the immune system so that it identifies the intruder in the future.

But antibody designs against HIV have so far been a huge disappointment. So far, none has been found that can deliver a big immune punch.

One suspected reason is that wild types of HIV may be somewhat different from the strains used in labs.

Among wild strains, the proteins on the surface of the virus which are often used as the antibody primers may be more difficult to detect because they are folded over and may be camouflaged by slippery sugar molecules.

Another likely reason for the failure is viral variety - with different sub-types of HIV and mutation, the antibodies may be hunting an absent or a shifting target.

The French team has taken a different and more specific tack, targeting a tiny area of a surface protein that, they say confidently, is common across the range of HIV types.

This area is called CBD1 and is part of the gp41 protein. CBD1 binds to a protein in the T-lymphocyte immune cell called caveolin-1, thus helping the AIDS virus to dock to and infiltrate its target.

The researchers synthesised a chain of peptides - the building blocks of proteins - corresponding to CBD1 and immunised rabbits with it.

In lab-dish experiments in which blood taken from the immunised rabbits was exposed to human T-cells and the virus, it proved to be a remarkable shield against a range of sub-types of HIV-1, the commoner and more vicious form of the two big strains of the virus.

"The anti-CBD1 antibodies work in two ways," the press statement said. "Firstly, they inhibit cellular infection by HIV, and secondly, among cells that are already infected, they lead to the production of defective viruses [which] are unable to infect other cells."

The vaccine is only experimental and has not been applied to any human volunteers to see whether it is safe or effective.

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Even so, the findings are deeply encouraging, the French scientists say.

"It shows that the CBD1 area can be used as a specific target for developing an effective immune response."

The study, lead-authored by Ara Hovanesian of the Pasteur Institute and National Centre for Scientific Research (CNRS), was published on Tuesday in a specialist journal, *Immunity*.

More than 20 million people have died of AIDS and some 38 million more have HIV, the virus which causes it.

But in the entire 23-year history of AIDS, only one vaccine, a design based on the gp120 protein, has ever gone through the entire three-phase test process, and it proved a disappointing flop.