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# HIV vaccine moves a step closer

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An HIV vaccine has come a step closer with the identification of immune system cells that can be targeted to provide protection against the most common form of the virus.

A Phase I clinical trial that will test the ability of an engineered HIV protein to activate the antibody-generating cells is now in the planning stage.
The cells are precursors of a specific B-cell, a type of white blood cell, that produces the right sort of antibodies capable of attacking and neutralising multiple strains of the HIV-1 virus.

Crucially, scientists found that the cells are present in most people. Development of a successful vaccine depends on finding a way to stimulate them so that they transform into "broadly neutralising" cells effective across a variety of HIV-1 strains.

The researchers believe they have a vaccine protein, known as eOD-GT8 60mer, that can target and activate the cells, and which could form the basis of a vaccine.

Prof William Schief, who heads the laboratory at the Scripps Research Institute in La Jolla, US, where the protein was developed, said: "We found that almost everybody has these broadly neutralising antibody precursors, and that a precisely engineered protein can bind to these cells

that have potential to develop into HIV broadly neutralising antibody-producing cells, even in the presence of competition from other immune cells."

The starting point of the research, published in the journal Science, was the discovery that certain people are naturally immune to HIV. Their immune systems produce antibodies that effectively neutralise many strains of the rapidly mutating virus. After analysing millions of B-cells from 15 individuals who tested negative for HIV, the team identified potential HIV-fighting cells that are present in about 96% of people.

Co-author Prof Shane Crotty, also from the Scripps Research Institute, said: "The challenge for vaccine developers is to determine if an immunogen can present a particular viral surface in a way that distinct B-cells can be activated, proliferate and be useful.

"Using a new technique, we were able to show - well in advance of clinical trials — that most humans actually have the right B-cells that will bind to this vaccine candidate. It is remarkable that protein design can be so specific as to 'find' one in a million cells, demonstrating the feasibility of this new vaccine strategy."

Last June, Scripps scientists and US colleagues reported that the eOD-GT8 60mer protein produced antibody responses in mice that went part of the way towards suppressing HIV.