

Researchers capture images of the elusive protein HIV uses to infect cells

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Structure of the HIV spike protein in its closed state, which makes it less detectable to immune system. Credit: Peter Kwong

HIV is adept at eluding immune system responses because the protein it uses to infect cells is constantly changing.

Now a team of researchers including scientists from Yale have stripped the cloak from this master of disguise, providing a [high resolution image](#) of this surface spike [protein](#) and monitoring how it constantly changes its shape, information that suggests new ways to attack the virus through drugs and vaccines.

In two papers [published simultaneously online Oct. 8](#) in the journals *Science* and *Nature*. team of researchers led by scientists from the labs of Walther Mothes at Yale University, Peter Kwong at Vaccine Research Center at the National Institute of Allergy and Infectious Diseases and Scott Blanchard at Weill Cornell Medical College describe the structure and dynamics of the HIV spike protein, which the virus uses to fuse with and enter cells.

"Now we can see how this fusion machine works, and in a general way it is similar to how fusion works in influenza and Ebola," said Mothes, associate professor of [microbial pathogenesis](#) and co-senior author of the *Science* paper.

The spike protein needs to be in "an open state" to fuse with and infect cells. However, in its closed state it is less visible to antibodies. Thus, the spike protein tries to stay longer in the closed state and only briefly opens, making it more difficult to attack the virus.

Mothes noted that new research explains why a class of antibodies—discovered in few AIDS patients—offer protection against the disease. These [broadly neutralizing antibodies](#) keep this spike protein closed and thereby prevent the spread of the virus.

"The determination of the structure of this closed configuration of the HIV spike protein and the direct visualization of its fast openings represent a major step forward for drug and vaccine design," Mothes said.

More information: medicalxpress.com/news/2014-10...ion-hiv-readies.html

Provided by Yale University

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